



Town of Marshfield Energy Resiliency Update

Planning for the future .
Hitting the goals for 2035.

Updated - March, 2022



Town of Marshfield

Energy Resiliency - Clean energy by 2035

Energy Overview -

- Need to focus on major updates
- Solar PV array on landfill update (waiting on Eversource ASO Study)
- Solar PV on municipal properties (in progress)
- Updating outdated / inefficient systems plan (FBMS updates, Lighting)
- Community Choice Aggregation update (Approved, waiting to implement now)
- Environmental justice program (Over 400 HEA made and efficiencies done... Ongoing)
- Hybrid/Electric vehicle update (Need to focus in 2022 on town vehicles)
- Street lighting w/ solar (Michael and Fred are discussing a plan to outfit lights with solar or LEDs)
- Geothermal (Working on a feasibility study to outfit the High School and/or HS/Martinson/FBMS)



Town of Marshfield

Energy Resiliency

Energy consumption breakdown

Electricity consumption over the last year has leveled due to implementing efficiency measures.

\$834k/yr (Cost decrease of 3%)

Consumption: 9,478,000 kwh

Natural gas consumption - trend to decrease usage but cost has gone up.

\$180k/yr (Cost is level)

Consumption: 384,000 therms

Gasoline consumption has decreased nominally

\$200k/yr

Consumption: 100,000 gallons

Diesel cost - \$100k/yr

Consumption: 41,012 gallons

Propane cost - \$18k/yr

Consumption: 1,000 gallons



Town of Marshfield

Energy Resiliency

How to address the issues

- **Electricity:** Updating older systems with more energy efficiency lighting, system controls, pumps, adding solar and battery to reduce energy loads. We are looking at adding large batteries at the WWTP to reduce their loads on and off peak time.
- **Natural Gas:** Switch gas fired boilers, treatment plants to electric. Heating/cooling systems to electric, with natural gas back-up
 - Reduces (not eliminates) need for natural gas. This is currently the most efficient way to do things
- **Consumption:** The cleanest energy is energy you don't use. Replace/update lighting, heating controls, insulation, pumps, etc.
 - Continue to upgrade outdated fixtures
 - Continue to look at ways to be more efficient as technology improves
- **Gasoline & Diesel:** Replace retired vehicles with electric or hybrid version
 - There are very affordable and reliable electric and hybrid vehicles already on the market. And more coming everyday



Town of Marshfield

Energy Resiliency

Solar PV on the landfill update

- Town approved plan
- Permitting is underway
- Approvals with DEP and DOR are being finalized
- Impact studies have been completed
- Projected revenue: 1.1m / year

Waiting on:

- Eversource has delayed the process due to substation upgrades that need to get done.
- Mr. Maresco and the team are working to expedite the process all several fronts.
- If we're successful in expediting, landfill will be up and running spring of 2022.



Town of Marshfield

Energy Resiliency

Solar PV on municipal properties

- Identified sites at all the schools
 - Note: As part of the solar agreement, Martinson will get a new roof for free saving the town 3/4 million in capital costs)
- WWTP
- New Police station (almost complete. Should be done late April)
- New DPW site (start construction in 2022)
- Council on Aging (start construction later this year)
- Total project revenue: 1.4m / year

Status:

- Three locations have interconnection approval
- Next steps: Once each project gets a green light, we'll start the permitting process, interconnection, etc.
- Completion date: ~ fall of 2022/23



Town of Marshfield

Energy Resiliency

Updating outdated energy systems

- Each 'retired' heating and cooling system should be switched to air source heat pump for heating and cooling with natural gas back-up
- This greatly reduces natural gas to almost zero
- Better efficiency and control with combined heating and cooling
- Replace as we go. All boilers and cooling system will need replacing at some point

Examples:

- Martinson Elementary: Working with Fred to replace boiler
- High School: Looking at Geothermal to run the heating and cooling system will reduce the towns 2nd largest energy user



Town of Marshfield Energy Resiliency

Community Choice Aggregation update

- Program is moving forward with the state
- Good Energy presented their plan to launch the program
- Timing: Looks like it will be ready to launch sometime this spring

Reminder:

- CCA offers residents and businesses more choices for cleaner / cheaper energy



Town of Marshfield **Energy Resiliency**

Environmental Justice program -

Get as many residents and businesses to do a MassSave audit

- Town of Marshfield recently awarded a \$25k grant to educate low and moderate income residents about clean energy, efficiency measures and the ability to reduce costs
- We coordinated with Spanish and Portuguese speaking population about the opportunity
- Worked with landlords and building owners to help reduce rent and/or condo fees if they implement clean energy and efficiency items
- Energy independence should be for everyone
- Over 400 Home Energy Assessment were conducted resulted in saving residents thousands on their electricity, heating and cooling costs



Town of Marshfield Energy Resiliency

Hybrid / Electric vehicle switch - Add charging stations all over town

- Marshfield spends 200k a year on gasoline for town vehicles
- Hybrid and Electric vehicles; sedans, police cruisers, light trucks, SUVs are all available now to purchase at reasonable prices
- Ex. Police interceptor hybrid vehicle savings per cruiser - \$4k / year on gas cost alone
- With the new solar electric installations, we'll have EV charging stations at over 10 locations around town including Police Station, Town hall, DPW building, Schools, Council on Aging and Fire Stations.
- Reasonable prices and rebates make the cost affordable



Town of Marshfield

Energy Resiliency

Street and Parking lights

- Marshfield spends 200k a year on street and parking lights
- Solar street lights are becoming more and more affordable everyday
- We're reviewing and working with manufacturers on available options

Continue to look a new and exciting technologies

- Reviewing options for additional energy generation, i.e. tidal / river energy, magnetic, geothermal, solar thermal
- Thermo-electric energy: Taking the heat from compost to charge batteries
- Engage FBMS and MHS students (green teams) in the energy revolution. Great experience, looks good on college app for future employment opportunities (both college graduates and skilled trade workers).