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Can you address global warming right here in Marblehead?

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Climate change is an issue that many Marblehead residents care deeply about. As a coastal community, we are directly impacted by the increased frequency and severity of storms as well as rising sea levels, both of which have been attributed to the increased temperatures of climate change.

The earth is warming at an alarming rate, mainly because greenhouse gases, such as carbon dioxide and methane, trap the sun's heat in our atmosphere. These gases have numerous sources, including gas-powered cars and coal-burning power plants. A lesser-known source is the decomposition of organic materials in landfills.

Marblehead is forward-thinking regarding trash disposal. Our Board of Health has a contract in place to have town waste hauled to a landfill in Keystone, NH, which captures the methane produced by organic decomposition. This gas is collected and used to heat the University of New Hampshire.

This is good news. But the even better news is that residents can do more to both learn about how landfills contribute to climate change and find solutions to reduce materials entering them.

Landfill gas basics

As organic materials decompose in a landfill, gases are naturally released as a byproduct. These gases are comprised of approximately 50% methane and 50% carbon dioxide (CO_2). Methane is a potent greenhouse gas (GHG) that is 28 to 36 times more effective than CO_2 at trapping heat in the atmosphere over a 100-year time frame, according to the latest Intergovernmental Panel on Climate Change (IPCC) assessment report. Therefore, it is a key contributor to global climate change.

Municipal solid waste landfills are the third-largest source of human-related methane emissions contributing 15% of total US emissions. In 2019, they were equivalent to the GHG emissions from over 21.6 million cars driven for an entire year, according to the Environmental Protection Agency (EPA).

The advantages of capturing methane

The facility that handles Marblehead's landfill trash takes this potent GHG and uses it as a source of energy. By using landfill gases to produce energy, landfills can significantly reduce their emissions of methane and avoid the need to generate energy from fossil fuels. The EPA reports that landfill gas energy projects capture approximately 60% to 90% of the methane emitted from the landfill, depending on system design and effectiveness.

This is a great start, but what can we do as individuals and families in Marblehead about the estimated 10% to 40% that is still reaching the atmosphere and warming our planet? You may be surprised that the answer is: a lot!

What is producing all of this methane?

Before we discuss what you can do to take action, you might be wondering, what makes up the majority of organic matter that is creating all of this dangerous methane? That would be food waste. A new report issued in January 2022 by the EPA entitled, "Downstream Management of Organic Waste in the US" states that in 2018, food made up 22% of the municipal solid waste generated in our country, with food waste being the single largest component disposed of in landfills. This includes 35.3 million tons of food waste that will make 17.6 million MMTCO2e in greenhouse gas life cycle emissions over its lifetime in the landfills.

Put another way, if wasted food were a country, it would be the third-largest emitter of global GHG emissions, behind China and the U.S.

These are national and global numbers, but what about Marblehead? What about your family? What about you? How much food are we throwing away? The EPA estimates that the average household generates 338 pounds of food waste every year. Sadly, trends are showing that this number is increasing every year.

How else can we dispose of food?

The first solution to the problem of all the food waste and resulting methane is to simply

but suffice it to say, we could all do well by wasting less food.

For the problem of food that is left unused or uneaten, rather than tossing it into your kitchen garbage can, the best place to dispose of it is in a compost bin. The EPA reports that in 2017, just 6% of food waste was composted, as opposed to 69% of yard waste. The trend is looking up, however. Food composting has grown 278% from 2000 to 2017.

In Marblehead, we are fortunate that we have several opportunities to make a difference by composting, thereby easily diverting our food waste from eventually becoming methane-producing rubbish. Some residents choose to compost in their own backyards, while others use the services of local company, Black Earth.

Black Earth, founded in 2011 in Gloucester, is a full-service compost company that serves many municipalities in our area, including Marblehead. The Board of Health has made available six bins at the Transfer Station to collect all types of organic waste, including food scraps, coffee grounds and filters, napkins, paper towels and much more. (See https://blackearthcompost.com for a complete list of acceptable items). Black Earth also offers curbside pickup for a fee.

The EPA reports that with even just part of food waste diverted to composting, the avoided methane emissions result in a significant decrease in greenhouse gas emissions. EPA modeling shows that diverting just 25% of currently-landfilled US food waste would reduce life cycle greenhouse gas emissions by approximately 30%.

You might be wondering, doesn't the food waste still produce methane, whether it is disposed of in a landfill or at a composting facility such as Black Earth? No, it doesn't. The reason is that when an aerobic process is used, in other words, when oxygen is present in the decomposition process, the methane-producing microbes are not active. Therefore, composting practices that maximize aerobic conditions will be the most effective at reducing greenhouse gas emissions. Black Earth is such a facility.

In Marblehead, approximately 600 households out of the total of 8,000 are composting. In 2021, Marblehead residents saved 186 tons of waste from the landfill by using Black Earth's pickup services at home and at the Transfer Station. These numbers are improving, but surely we can do more.

Environmental and social benefits of diverting organics from landfills

Besides eliminating dangerous greenhouse gases, composting offers several other environmental benefits. Primary among these is the creation of compost, a dark, earthy

smelling material that resembles soil and is high in plant nutrients. When your food is turned into compost, all the energy, water, labor and nutrients are not wasted as they would be if sent to the landfill. Instead, your trash becomes an extremely beneficial “new” product.

The benefits of using compost include improving soil, increasing productivity, suppressing soil-borne disease organisms, preventing topsoil loss, providing erosion control and lessening or eliminating the need for fertilizers.

Diverting organics from landfills also lengthens the lifespan of a landfill by helping to avoid it reaching capacity. Removing food waste also reduces landfill leachate quantities and management costs.

What about my garbage disposal?

Using a garbage disposal is not an effective substitute for composting. Food that goes down your sink’s disposal begins its journey to a waste-water treatment facility, where it has to be removed from the water, which the IPCC estimates generates 5% of global methane emissions. Additionally, the disposal requires the tap to be running, which wastes water and raises sewer bills in your home.

In conclusion

When hearing about climate change and the potential impacts that hit us right here in our town—storms, flooding, property damage and associated costs—it is easy to quickly feel overwhelmed. Greenhouse gas and resulting global warming is a tremendous problem, and one that is not going away. But, as Marblehead residents, we are fortunate to be able to make a significant difference in preventing some of these dangerous gases from reaching our atmosphere. The solution is to compost, whether by signing up for curbside pickup or by taking your organic waste to the Transfer Station yourself. Either way, you can be confident that you are making a valuable contribution to the future health and viability of our beautiful community of Marblehead, as well as the entire planet.

Sustainable Marblehead is available to help any resident who would like to learn how to take advantage of the compost services in town, from what goes into your compost bin, to what is the best process to use. We believe you will find composting to be easier and less messy than you ever thought, and will quite possibly wonder why you didn’t try it sooner. Please email info@sustainablemarblehead.org for more information and visit us at https://www.sustainablemarblehead.org.

Note: Thank you to the U.S. Environmental Protection Agency for providing many of the facts and figures referenced in this document. Visit epa.gov for further research.