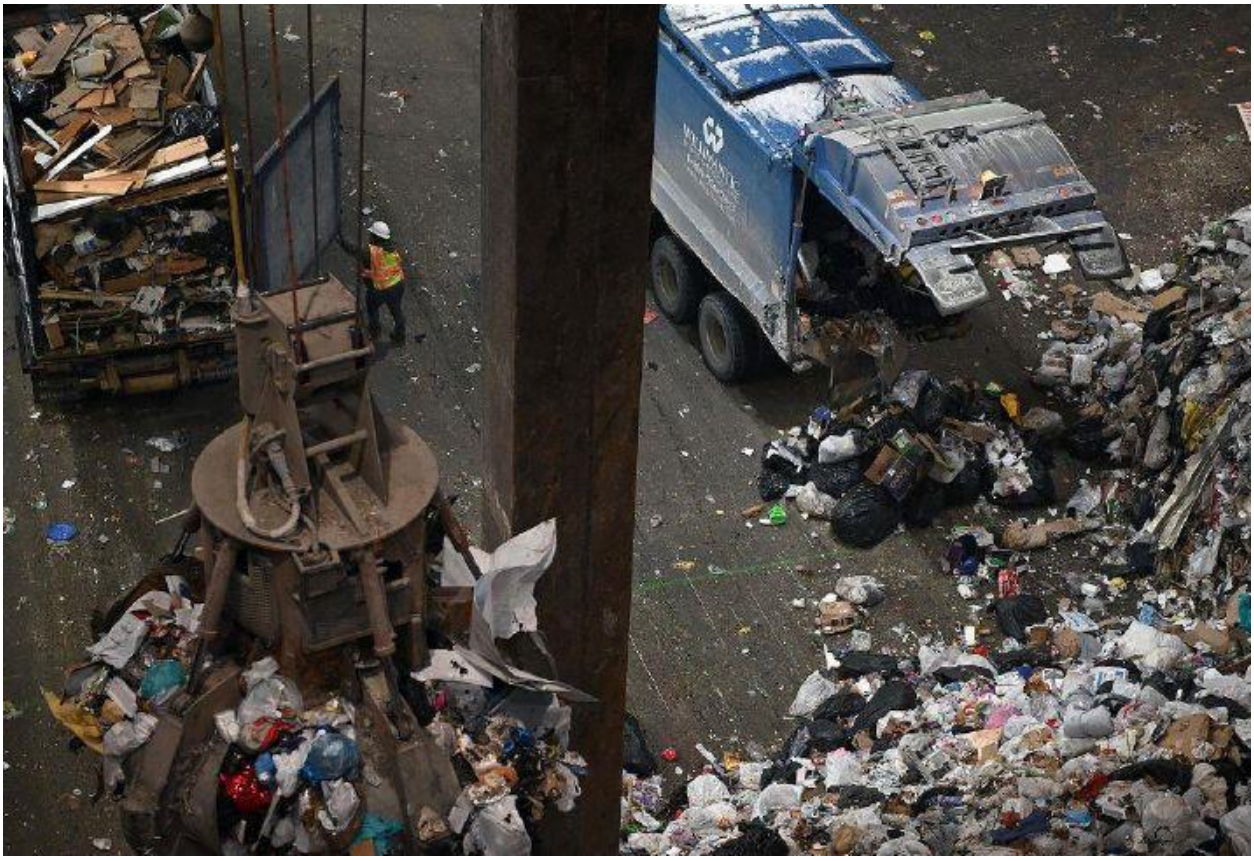
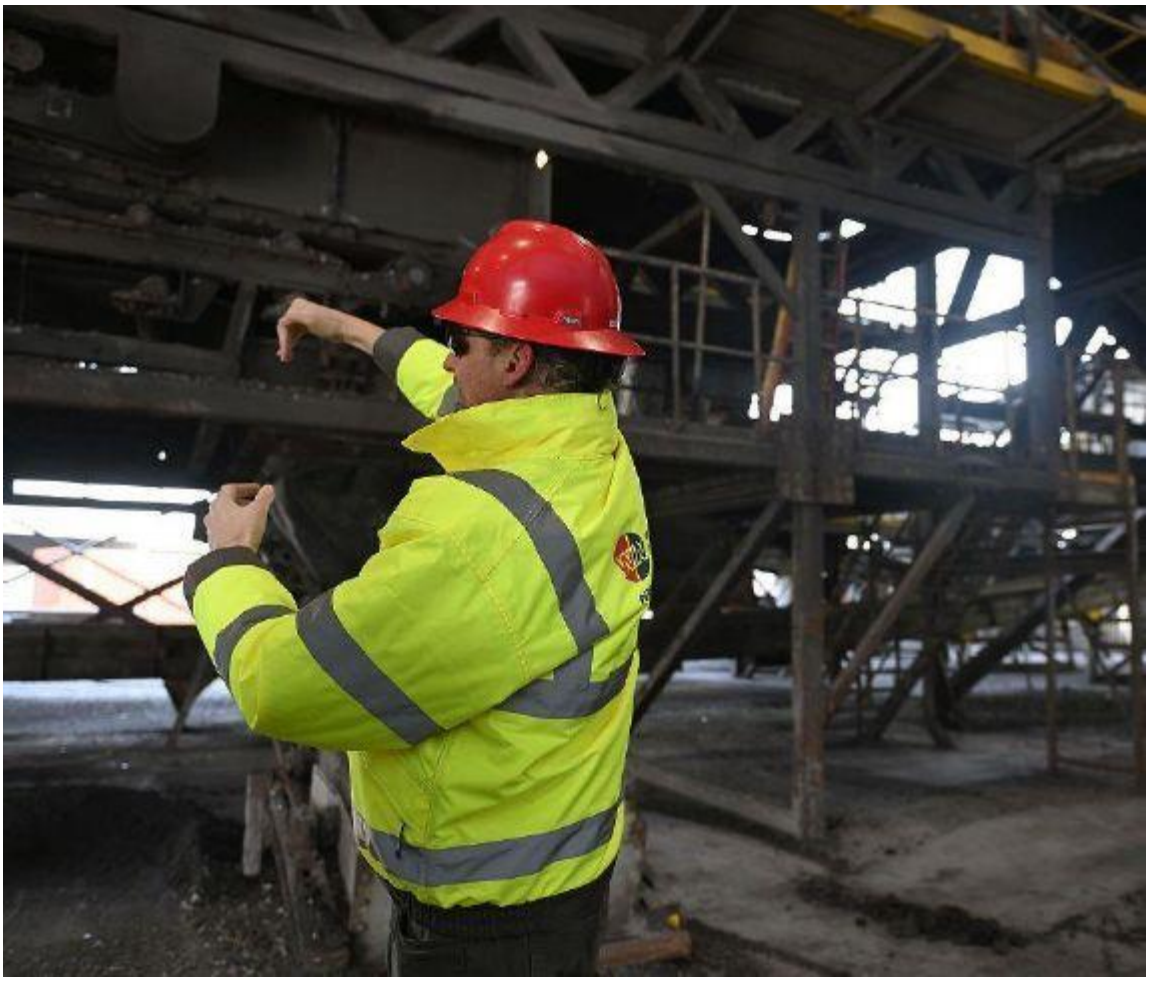
The Day

Sunday, Feb. 2, 2025



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One of the ash landfills at WIN Waste Innovations Putnam Ash Residue Landfill Thursday, Jan. 23, 2025. (Sarah Gordon/The Day)

From trash to ash: Following household garbage through eastern Connecticut

By Theresa Sullivan Barger Special to The Day

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When Town of East Lyme trash truck operator Marc Morgan collects trash from the end of residents' driveways, it takes less than 15 seconds for him to stop at the curb, maneuver a pair of metal arms to reach out and grab the trash bin on each side, lift the can and dump it into the opening on top.

Morgan's steering wheel is on the right side of the truck like a U.S. Postal Service mailman, since he pulls the truck over on the right side of the road. He operates a joystick to maneuver the automated arms. Residents are told to keep the trash and recycling containers at least 4 feet apart so the automated arms can reach in and grab each container without tipping over the other. When people leave the cover open and water or snow enters the bin, that creates more work later in the waste disposal stream.

If people put recyclable items, construction waste or hazardous materials like paint cans or lithium batteries in the trash, that ultimately impacts both the cost of waste disposal and its environmental impact.

A reporter and photographer followed the trash on a January morning to see what happens to it after it's thrown away.

On average, each Connecticut resident produces more than 5 pounds of solid waste daily and just over 1 pound of that gets recycled, according to the **state Department of Energy and Environmental Protection (DEEP)**. The rest, about 4 pounds, gets disposed of. Connecticut's 3 million residents generated 3.49 million tons of municipal solid waste (MSW) in 2022 and disposed of 1.55 million tons in the state, according to a 2024 DEEP report. In 2022, 40% of MSW, 640,000 tons, was shipped out of state. That year, the state diverted 1.3 million tons, or 37% of MSW generated, from disposal via recycling, composting, or anaerobic digestion. The state fell short of its statutory goal of 60% MSW diversion by 2024.

Connecticut used to have six trash-to-energy plants. The 34-year-old Hartford facility closed in 2022 after the state rejected a $330 million proposal to upgrade the aging trash incinerator,

which suffered from repeated mechanical failures, and the 26-year-old Wallingford facility closed in 2015 because recycling reduced the trash supply to the point that the owner proposed closing the waste-to-energy operation. This left plants in Bridgeport, Bristol, Lisbon and Preston.

The average age of waste-to-energy incinerators that closed in the United States between 2000 and 2024 was 25 years, according to Energy Justice Network. These days, because the remaining trash-to-energy plants are at capacity, Connecticut sends trash to seven states, primarily Pennsylvania and Ohio, annually using trucks and rail.

To reduce solid waste disposal costs and prolong trash-to-energy plants' lives, the state legislature passed laws requiring that 25% of solid waste be recycled. By law, Connecticut mandates residents and businesses to recycle: both glass and metal food and beverage containers, used motor oil, vehicle (lead-acid) batteries, scrap metal, corrugated cardboard, newspaper, leaves, white office paper (with residential exception,) nickel-cadmium batteries and grass clippings.

To the tipping floor

Once the trash truck operator has completed his collection route, Morgan drives his truck about 28 miles to the WIN Waste Innovations trash-to-energy facility in Lisbon.

The average 100- to 110-mile route to pick up 600 trash cans daily takes about four to five hours. In addition to the drive time to and from the Lisbon plant, sometimes trash haulers have to wait in long lines to have their trucks weighed and to dump their load, said Justin Porter, East Lyme Public Works Department superintendent. The drivers also conduct daily inspections, cleaning and maintenance on the $400,000 trucks.

The Lisbon facility accepts trash from 29 cities and towns, including 13 New London County communities. Morgan drives his truck onto a scale where the weight is recorded, then pulls over to the enclosed receiving area to dump the load onto the tipping floor.

On his way out, Morgan's truck is weighed again and his cargo's weight is recorded before he drives back to East Lyme.

Next, on the ground of the tipping floor, someone pushes the dumped waste around and checks for items that don't belong, especially hazardous waste such as paint cans and some construction debris. A worker driving a front-end loader pushes the debris into the refuse pit.

Five stories up in the control room, Mark Irvine, a crane operator, uses lefthand and righthand joysticks to move the trash around with a giant claw, similar to the claws seen at diners or carnivals to hunt for a toy. During his 12-hour shift, he "fluffs" the debris and looks for wet material, which he separates and moves away from the main area so it can dry out before going into the boiler. He also looks out for anything that doesn't belong in the combustion process as a final pair of eyes, picking it up and moving it away from the "refuse pit" and "feed hopper."

A refuse feed hopper moves the trash into the furnace, where it burns for about an hour at 2,500 degrees Fahrenheit. This facility burns about 550 tons per day, said John Horgan, plant manager. The goal is to make 150 megawatts of energy per day, he said. The Lisbon facility generates enough energy to operate the plant and to power more than 9,400 homes per year.

In a trash-to-energy facility, the waste from the burned trash is absorbed by the boiler tubes in the furnace, creating high-pressure steam. The steam drives a turbine generator that produces electricity that is sold to electrical grids to power local homes and businesses. The steam condenses back into water to be reused in the boiler through the “steam cycle.”

The facility operates 24/7, 365 days per year and employs 37 people to keep up with the amount of trash it receives. About 90% of the trash turns to energy and 10% remains as waste ash, Horgan said. After the trash turns to ash, it passes along a conveyor belt under high-powered magnets, which separate and recover metals from the ash. Metals high in iron are called ferrous metals, and metals with little to no iron are non-ferrous metals. Ferrous and non-ferrous metals are separated because they’re used for different purposes.

The Lisbon facility is in its 29th year. While some sources put the life expectancy of trash-to-energy plants at 30 to 50 years, at WIN Waste Innovations “the life expectancy is based on the plant's ability to continue to meet regulations; there are plants in Europe that have been running for more than 50 years,” said Mary Urban, communications director.

“We still produce too much trash. If people recycled more, we wouldn’t have to build a new waste-to-energy plant,” Horgan said. To prolong the useful life of the facility, he said, the company shuts down one of the two boilers every six months for preventative maintenance.

WIN Waste sends a maintenance team from plant to plant “to make sure the tens of millions of dollars invested per plant, per year in maintenance, repairs and upgrades keep the plants operating efficiently and able to continuously meet standards,” Urban said.

Since the operation runs 24/7, there is also a crew in the plant continuously monitoring emissions to ensure the facility complies with the federal Environmental Protection Agency and DEEP standards for clean air and environmental compliance.

While trash-to-energy plants are environmentally preferable to landfills and traditional incineration, they still burn plastics, cardboard and other materials that could be recycled, according to Recycling Track Systems Inc., a waste and recycling management company. At the Lisbon facility, they don’t have the time to pull out recyclables such as the cardboard and plastic laundry baskets in the refuse pit.

Next stop, Putnam

Once the metals have been separated from the ash, and the ash is quenched and dried, it leaves the boiler via a conveyor to be loaded onto a trailer. That vehicle is weighed before leaving the

Lisbon facility, then weighed again when it arrives at the WIN Waste "monofill" facility in Putnam, about 32 miles away. A monofill is a landfill that stores a single type of waste.

At the Putnam facility, which is nearly two miles from Kennedy Drive, the tractor-trailer driver dumps the hot ash in a pile, where it sits to “age” for about a month to get to the right consistency to go through a three-stage sorting process. Steam floats off the ash pile as it cools.

When it’s ready, the ash is loaded onto a series of elevated conveyors. At each stage, a high-powered magnet filters out metals — first at the size of a tennis ball, then the size of a golf ball and then the size of a bb, said Don Musial, WIN Waste’s director of ash monofill. The process ultimately removes metal, so at this stage, about 7% to 8% of the incinerated waste contains metal, Musial said.

The largest type of metal is iron, followed by aluminum, copper, tin, lead, zinc and even some precious metals. The company has a 50-50 partnership with a Netherlands company called Blue Phoenix, which works with WIN Waste to operate the Putnam system and to find markets in which to sell the reclaimed metals, Musial said.

WIN Waste ships the metals to domestic and overseas recyclers, where they’re further processed and refined to the point where they can then be sold to automakers, electronics manufacturers and other manufacturing companies. There are far more waste-to-energy plants in Europe than there are in the U.S., which has only 60 facilities; there are also metals recyclers specializing in accepting the wide mix of metals found in ash that process them so they can be reused in manufacturing, Musial said.

“If we sent the mix of smaller metals to any recycler in the United States, they would mostly come out as waste and never get reused,” he said.

Once the metal has been extracted, the remaining ash is disposed of on the 430-acre Putnam property, next to the town of Putnam’s closed and capped former trash landfill. The land is first lined with impervious high-density polyethylene that is designed to prevent liquid waste from leaking into the soil and groundwater much like a bathtub. WIN Waste operates four monofills where the company dumps waste ash once it’s been combusted and energy and metals have been removed. Once an area where the waste is dumped reaches capacity, it is capped to contain it. The Putnam location has enough space to store waste for at least the next 30 years, Musial said.

During that time, Musial and others are working to come up with commercially viable reuses of the waste ash. In the conference room at the Putnam facility, there’s a wall of concrete blocks made with recycled ash. In Europe, there are more companies willing to reuse ash and mix it with cement and road paving materials, he said. In the United States, he said, there’s less incentive to do so since virgin materials are plentiful.

Musial, who has worked in waste management for 30 years, said he would like to see less waste. “Any type of landfill site, they’re not infinite.”