Delaware Organics Task Force

SCR 35

Draft Report to General Assembly

March 1, 2016

Executive Summary

The Delaware Organics Task Force has held several public meetings to discuss and evaluate the best possible ways to increase recycling and diversion of organic waste from Delaware landfills, without creating odors. The Task Force has identified the leading technologies available to manage organic waste and discussed the benefits and challenges of each technology.

While it is clear all existing organic treatment technologies have the potential to produce odors, the Task Force believes any facility that is properly managed will produce negligible odors and some technologies exist that may have the potential to create fewer odors. That being said, there are many challenges in the proper management of organic waste regardless of the technology chosen, including economics, contamination, market volatility, the volume of inbound material, the creation of a marketable products and odor and vector control.

The Task Force believes Composting and both Wet or Dry Anaerobic Digestion technologies can work in Delaware under the right conditions. It is encouraging that the Delaware Solid Waste Authority (DSWA) and several private entities are currently discussing projects that could potentially reduce the amount of organic waste going to Delaware landfills using one or more of these technologies.

The Task Force recommends that any projects be kept to a small scale initially and only be permitted to expand gradually to ensure growth, feedstocks, and materials management are properly addressed. It is also believed that multiple sites should be located throughout the State and can and should target only those organic waste streams with low or no contamination. It is clear these projects should not be implemented adjacent to residential areas. All projects must be permitted and closely monitored by DNREC and/or DSWA as required by Delaware code and require implementation of the best management practices available.

Task Force Members

Co- Chair Mike Parkowski (DSWA)
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Kathy Zdrojewski – Representative of residents paying for trash service

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Senate Concurrent Resolution 35 was passed by the Senate of the 148th General Assembly of the State of Delaware, the House of Representatives concurring therein, that a Task Force will be assembled to discuss and evaluate the best possible way to recycle organic waste within the State of Delaware in an odor-free manner with the requirement the Task Force report to the Delaware House and Senate Natural Resources Committees and the Governor by March 1, 2016, or when called upon.

Background and Objectives

With the closure of the Wilmington Organic Recycling Center and Blue Hen Organics electing to stop composting food waste, there are currently no options for commercial food waste composting in Delaware. While there are many forms of organic waste, for the purposes of this report, the task force is using the following definitions for 'Organic Waste' and 'Organic Waste Contamination'.

Organic Waste- the food waste, compostable paper and yard waste that are currently going into Delaware landfills and are clean enough to be collected separately from trash so that they can be recycled in an odor-free manner.

Organic Waste Contamination – materials that may be mixed with and interfere with the processing of Organic Waste but are not Organic Waste and, therefore, require removal prior to processing. Examples include but are not limited to plastic wrap/bags, glass, metal, dishware, and cutlery.

Using the 2006-2007 Statewide Waste Characterization Study, the DSWA, identified 120,000 tons of organics material that fit the definition of Organic Waste. The DSWA is currently conducting a new 2016 Waste Characterization Study that will give us more accurate data on the amount of recoverable organic waste which is ending up in Delaware landfills. While the 2016 Waste Characterization Study is only partially complete, it is projected that +/-125,000 tons of Delaware generated organic waste will be available for management. Restaurants, grocery stores, and convenience stores are some of the largest generators of organic waste that is being disposed of in Delaware landfills. The 2016 report has identified about 33.5% of waste from restaurants is unwrapped food waste. Unwrapped food waste is a good example of some of the easiest type of organic waste to collect because there would be minimal work required to separate it from other trash.

While SCR 35 identified odors as the main concern with organics recycling, there are many other challenges when dealing with organic recycling facilities and the various technologies.

Composting

Composting, also known as Aerobic Digestion, is the most basic technology used to recycle organic waste and the primary form of organics treatment technology used in the United States today. While there are various ways to aerobically compost organic waste, including in-vessel and aerated static piles, the most common way is to place the waste in a series of elongated piles called windrows. The waste starts to decompose naturally and the piles are turned over periodically so air and moisture are evenly distributed throughout the pile. This is done to maintain aerobic conditions, eliminate the potential for odor production and facilitate efficient decomposition. Over the period of several weeks, the windrowed material will continue to decompose and eventually transform into a soil-like substance known as compost. Quality compost contains many nutrients necessary for soil to grow vegetation and can be used to enrich the soil by aiding in moisture retention, improving soil porosity, reducing runoff, buffering pH and affording the slow continuous release of valuable nutrients. The biggest challenge with aerobic composting is ensuring contamination is removed and maintaining aerobic conditions. Failure to do so can result in odors and degrade compost quality. Inferior compost is difficult to market and thus can result in excessive stockpiling. The Task Force supports the use of windrow composting in Delaware provided the amount of material managed is limited and that it is managed correctly.

Anaerobic Digestion Wet

Anaerobic digestion (AD) wet is widely used as a source of renewable energy and is most commonly used at wastewater treatment facilities and on farms managing animal wastes. The process has high capital costs and produces a biogas, consisting mainly of methane and carbon dioxide. This biogas can be used directly as fuel, in combined heat and power gas engines or further refined into natural gas-quality bio methane. AD wet technologies, which are typically used to incorporate food waste, are more common in Europe than in the United States. In this process, food waste or similar feedstocks are pulverized into a slurry and sometimes combined with a liquid based sludge or slurry from other feedstocks. AD wet digesters process the slurry that requires energy input to move and process the feedstock. AD wet digesters require constant correction of conventional performance calculations, which requires the feedstock to be a consistent mix of waste. This is one of the biggest challenges with AD wet processes. Since residential and commercial food waste is made up of different types of food waste it makes it difficult to use in an AD wet system. AD wet systems cannot process wood waste, which makes it difficult to include yard waste unless there is the extra separation of the material. When all the biogas has been extracted the left over material is known as digestate. Managing AD wet digestate has all of the same issues associated with it as managing compost.

Anaerobic Digestion Dry

The AD dry process is currently the most common AD process used in the United States but its use to date is limited due to the high capital costs associated with this technology. In this process, organic waste is placed in a sealed vessel (usually looks like a small garage) where moisture and bacteria that creates heat are applied to the material to speed up decomposition and creates a biogas. The biogas is extracted from the vessel and used to fuel an engine to produce electricity. When all the biogas has been extracted the left over material is known as digestate. The solid fraction of the digestate must undergo further aerobic decomposition so the digestate can be used as a form of compost. Managing AD dry digestate has all of the same issues associated with it as managing compost. Just like windrows, digestate must be periodically turned to keep the material aerobic and prevent the formation of odors. The biggest challenge with this technology is contamination. If the digestate contains high amounts of contamination the material is not marketable and the economics of the facility do not work. The DSWA is currently doing extensive research into the existing AD dry facilities in the United States.

Animal Feed

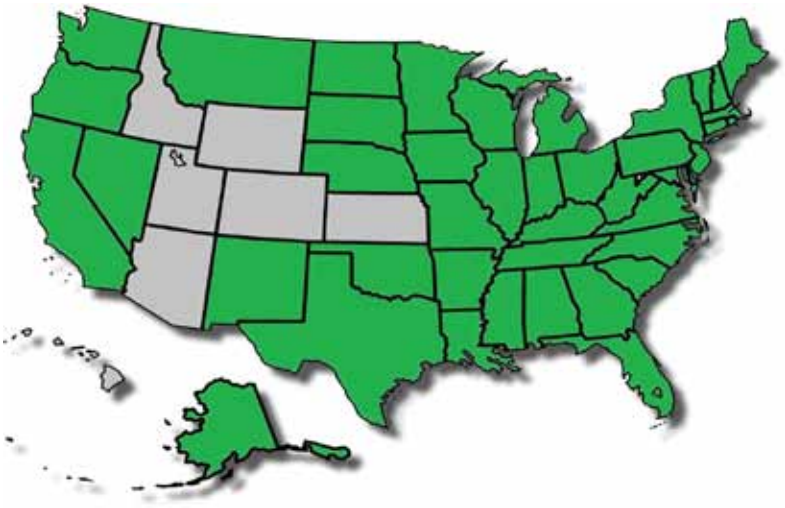
One of the oldest uses for food waste in the United States is for animal feed. It was once common practice in big cities to collect food waste in carts and take the food waste to small farms located outside of the city to feed livestock. While that practice ended long ago, there is limited use of food waste as animal feed which is subject to strict pasteurization requirements before it can be used. There are new technologies that convert food waste into pet foods. This is different from normal pet foods that use byproducts from food plants. With this process pet food is made entirely from post-consumer food waste. The challenge with this technology is collection, contamination and the exclusion of yard waste. The commercial viability of this model in Delaware is unknown.

Biofuel and Co-Generation

Biofuels can be produced from anaerobic digestion of Organic Waste. Generally, this would require a very consistent composition of the organic material. Once a biofuel is created, it can be used in a biofuel engine to generate energy at plants that use an adapted reciprocating gas engine or diesel engine depending upon which biofuel is being used. The advantage of using a biofuel is reduced need for hydrocarbon fuels and thus reduced carbon emissions. These plants are generally manufactured as fully packaged units that can be installed with simple connections to the site's electrical distribution and heating systems. Another variant is the wood gasifier plant whereby a wood pellet or wood chip biofuel is gasified in a zero oxygen high-temperature environment; the resulting gas is then used to power the gas engine. The use of biofuels to produce heat or energy requires a determination regarding whether or not Delaware's incineration laws would apply.

Organic Laws in Other States

Currently, 43 states have statewide recycling and diversion goals. The map below shows all of the states in green that have set goals in place.



Examples of goals using similar language and format

Recycling	Diversion	Waste Reduction
FL: Recycle at least 75% of the MSW	DE: Divert 72% of solid waste and 50% of MSW	NC: Achieve 40% reduction of MSW disposal
VA: Maintain, at least, a 25% recycling rate	MI: Find uses for 50% of the MSW stream	MT: Reduce 22% of the state's solid waste

Just like Delaware many states are realizing the only way to achieve high goals is to include organics diversion but currently, only 5 States have any type of landfill ban on Organic Waste (the broad category, not a single type of Organic Waste such as yard waste).

Typically a landfill ban suggests none of that type of waste is going into landfills; however, in all 5 states that have Organic Waste landfill bans, certain exceptions are made. In most of these states, the ban is only in effect for large commercial businesses and not for residents. In California, a few cities have place a ban on residential Organic Waste but there are even exceptions for different types of organics. Another model the task force spent time reviewing was from Massachusetts, which has a ban on disposal of commercial organic wastes by businesses and institutions that dispose of one ton or more of organic waste per week.

Recommendations

1. All organic waste recycling projects should, at least initially, be restricted to smaller-scale projects (≤ 30,000 tons/year) using the best management practices available. Expansion may be considered once the facility has demonstrated the ability to operate successfully for at least one year.

2. Employ several projects spread throughout the State targeting specific large generators of organic waste in Delaware as opposed to one large facility designed to manage all of the State's waste.

3. As part of the approval/permitting process, ensure markets exist for products produced by the technology used.

4. All projects must be permitted and closely monitored by DNREC and/or DSWA as required by Delaware code and require the implementation of best management practices.

5. Encourage DSWA and other private industries to develop small-scale Organic Waste processing facilities.

References

Kantner, Debra. “Difference In Recycling And Diversion Policies: Implications On Organics Management”. 2015. Presentation.