



The Red Hook Sludge Vessel

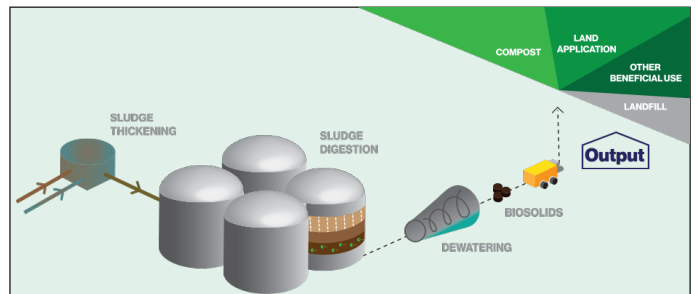


Biosolids Beneficial Use Plan 2020 - 2030

Biosolids are a product of the wastewater treatment process that, when treated to regulatory standards for beneficial reuse, are widely used to enhance soils and provide ecosystem benefits.

New York City Department of Environmental Protection (DEP) treats wastewater from all five boroughs at 14 wastewater resource recovery facilities (WRRFs), generating over 1200 wet tons of biosolids per day. Water is removed from these biosolids at six of the WRRFs, where third-party contractors collect, haul, and dispose or recycle the biosolids. Currently, these biosolids end up primarily in landfills, due to a lack of beneficial use processing capacity in the Northeast and a recent history of lower pricing for disposal. The cost for the City to manage biosolids has risen by over 50% in the past seven years as landfill capacity becomes increasingly scarce.

At the same time, the City has set aggressive greenhouse gas (GHG) reduction goals, as outlined in **OneNYC**, calling for a 40% reduction in emissions by 2025 and a 50% reduction by 2030 as well as a target of zero waste to landfill as part of this plan. Reduction of landfilling wastes, particularly of organic materials like biosolids that significantly contribute to GHG emissions, is in strong alignment with these goals. **When taken together, the drastically rising cost of landfill disposal and the desire to reduce GHG emissions point to the fact that the current biosolids management strategy is not sustainable from both a financial and an environmental standpoint.**







Biosolids, a resource, not a waste!

When biosolids are recycled to land, either as a soil amendment, compost, or fertilizer pellet, they impart multiple environmental benefits including:

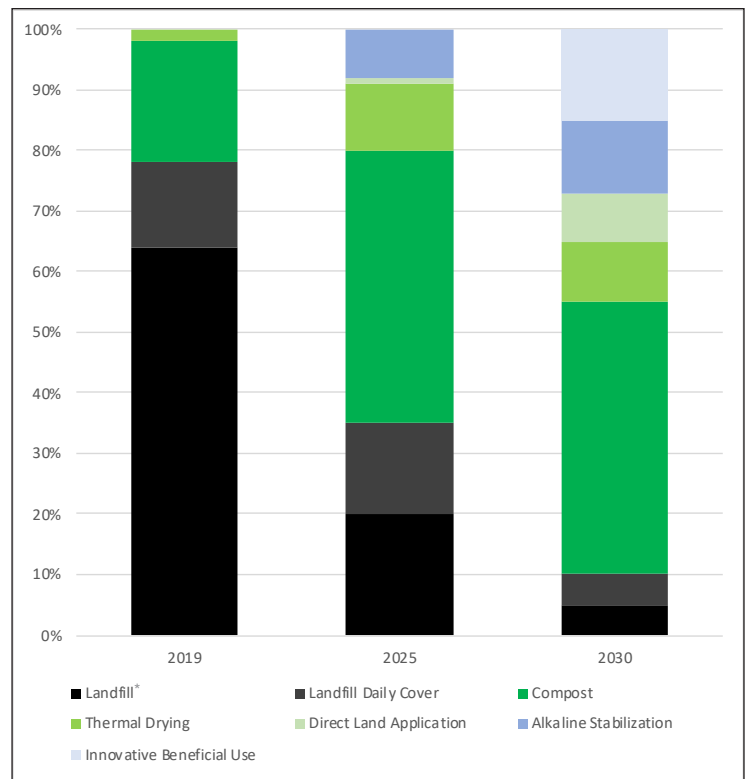
- **Building healthy soils** by improving their structure, increasing water holding capacity and improving erosion resistance.
- **Boosting plant growth** by providing slow release macronutrients, essential micronutrients and organic matter.
- **Sinking carbon** in the soil and in the plants they nourish while offsetting fossil based fertilizer use - all climate change solutions.

In support of the need to shift course, DEP formed an internal working group in 2020 that surveyed the market seeking collaborative opportunities to recover the city's biosolids as a resource. Opportunities were assessed based on the following desired outcomes:

-  Landfill diversion and GHG reduction
-  Diversification of end use sites (e.g. no more than 30% of the City's biosolids to any one site)
-  Diversification of vendors; at least three to four unique vendors should provide this service to the City
-  Commitment to returning some biosolids products to the City and collaboration on opportunities for expansion of urban reuse

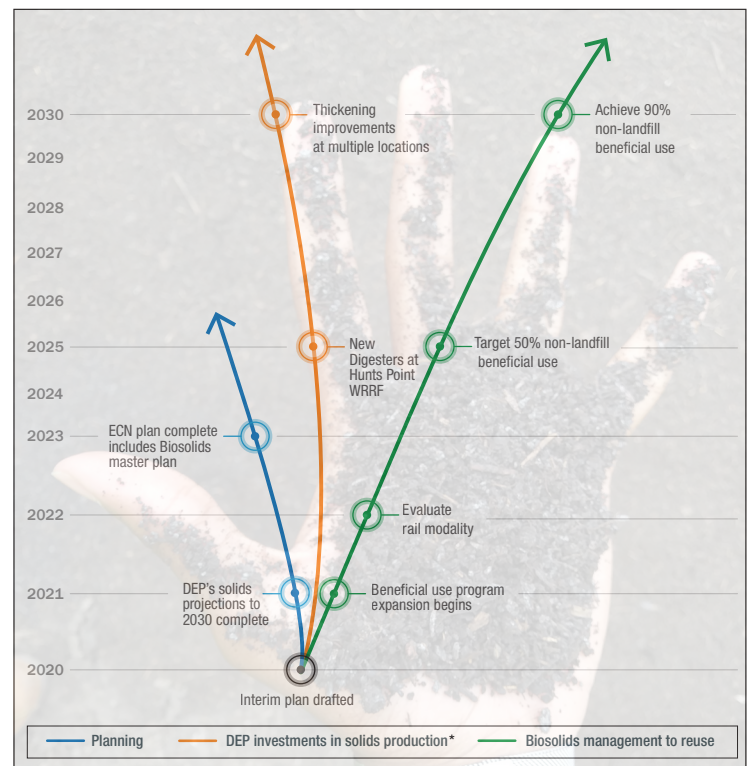
DEP has identified a pool of vendors capable of helping the City achieve its goals. Regional processing capacity under development or expansion by these vendors is being secured in long term agreements. This approach to manage up to 50% of the City's biosolids tonnage, will effectively displace a significant portion of the tonnage currently managed in landfills. These agreements are expected to begin in mid-2021 and have a duration of up to 10 years, providing NYCDEP with cost certainty and beneficial use throughout the near term.

The adjacent figures compare today's management portfolio to the portfolio envisioned in the future, once this management plan is in place. Through DEP's recent efforts, additional vendors interested in developing more beneficial use capacity in the region have been identified, potentially allowing DEP to further divert tonnage from landfills. DEP is committed to exploring new opportunities for biosolids resource recovery as infrastructure and projects come online. This approach allows for a flexible path forward in the near term. DEP is also developing a proactive approach to agency planning around biosolids, as part of the Agency's Energy & Carbon Neutralization Plan (ECN). Through these efforts, planning, capital, and day to day management are working together to achieve both the Agency's and the City's goals.



Expected biosolids management under the City's new contracting strategy.

* With a comprehensive plan to reduce waste, improve recycling rates, and divert organics from landfill, New York City aims to reduce the amount of material it sends to landfill by 90% by 2030.



DEP's Biosolids program - planning, investment and management timeline (2020-2030)

* Subject to funding availability