



Metro | *Making a great place*

Metro Solid Waste Alternatives Advisory Committee (SWAAC) July 8, 2015

Background for Solid Waste Roadmap: Long-term Management of Discards agenda item

Metro is looking at different options for managing our region's garbage after its current landfill contracts expire at the end of 2019. Currently, most of our region's garbage is sent on long-haul trucks to the Columbia Ridge Landfill near Arlington, Ore., about 150 miles east of Portland. This landfill, owned and operated by Waste Management, has received much of our region's garbage since the early 1990s. One option for the future would be to continue sending much of the garbage there or to other similar landfills for burial.

There are also other technologies that are used throughout the world that offer the potential to capture energy from the unwanted and non-reusable stuff we roll to the curb. Metro staff has begun to study what some of those technologies are and identified six approaches that could offer potential for capturing more value from waste:

- **Advance Material Recovery:** Much as our source-separated, commingled recyclables are processed through material recovery facilities, this option would envision facilities equipped to extract recoverable materials from wet or mixed dry waste.
- **Landfills:** Sending garbage to landfills where methane is extracted from the decaying waste.
- **Combustion:** Burning garbage to create heat and electricity.
- **Gasification:** Heating garbage at very high temperatures (1800 degrees Fahrenheit and higher) to create gases and break down into simple compounds that can be used for electricity generation or other chemical processes.
- **Anaerobic digestion:** Using bacteria to break down biodegradable material without oxygen to produce methane and carbon dioxide for electricity, natural gas or other fuels.
- **Refuse-derived fuels:** Developing new fuels from garbage that can be used in power plants and for other industrial purposes.

On July 15, 2014, the Metro Council held its first work session to discuss these different technologies and direct Metro staff to study them further. The six options were grouped into seven scenarios that illustrate potential options that could be integrated into our existing disposal system. These were purposefully evaluated as though all of the region's waste would be managed by a single scenario in hopes to better compare the advantages of the individual technologies.

1. Landfill and 1A. Landfill with Recovery

Dispose of waste

2. Direct Combustion and 2A. Combustion with Recovery

Recover Energy from Waste

3. Gasification after Advanced Material Recovery

Recover Energy or Alternative Fuels from Waste

4. Dry Anaerobic Digestion after Advanced Material Recovery

Recover Energy from Waste and reduce GHG from Landfill residue

5. Refuse Derived Fuel with Dry Anaerobic Digestion and Advanced Material Recovery

Recover Energy from Waste and produce fuel to replace coal

Some form of Advanced Material Recovery (AMR) could be considered with the use of Landfills and Direct Combustion scenarios, but both technologies can manage the region's garbage as delivered. For this reason, an additional option is included in each of these scenarios to include advanced material recovery. AMR will be required for Gasification, Dry Anaerobic Digestion and Refuse Derived Fuel processes or those would not be viable options.

Even with AMR, Metro believes that the material sent to dry anaerobic digestion will have too many contaminants to make use of the digested material for landscaping amendment or agriculture. Scenario four assumes it would go to a landfill, but in scenario five the digested material would be used for Refuse Derived Fuel.

Metro evaluated the seven scenarios for cost, material recovery, energy recovery and greenhouse gases. From the analysis that was completed in late 2014, only a few conclusions surfaced.

1. Direct combustion, without material recovery, gets the most energy from waste, but with materials recovery it still does quite well and gasification and refuse derived fuel would get about the same energy recovery.
2. Anaerobic digestion showed the greatest GHG advantage, but all scenarios with advanced material recovery have a large potential to reduce GHGs.
3. Additional information was needed to refine current technology information with real, verifiable and implementable processes from vendor-specific technologies.

In spring 2015, Metro issued a Request for Expressions of Interest (RFEOI) to seek responses from companies experienced in successful implementation of the technologies listed above, other than landfills, and including advanced material recovery. Metro received 19 responses to the RFEOI from established companies representing firms from 8 countries, and all 5 of the technologies were represented in responses in various combinations. Responses are confidential, so are not available for distribution, but will be discussed at the SWAAC meeting.