

## **For Discussion Purposes**

### **Zero Waste- What does it mean? Is it achievable?**

The concept of “zero waste” came up at an earlier Committee meeting when discussing realistic diversion goals. We did not, however, have a thorough discussion of the concept, but rather talked about realistic diversion rates being achieved in other US communities. There was a session on Zero Waste at the NY Federation of Solid Waste Associations conference in early May. Also, Clough Harbour hosted a webinar on San Francisco’s waste management systems and zero waste plan. We would like to share some of the content with the Committee.

Depending on the context, zero waste typically refers to zero waste to landfills, or, zero waste to landfills and incinerators. As far as we know, no community, solid waste planning unit, or waste management entity in the U.S. has achieved zero waste, rather it is a longer range goal. Cities like San Francisco and Los Angeles have identified it as a goal, but are still a ways off. Los Angeles is at 64% diversion, San Francisco is at 70%. San Francisco’s goal is zero waste to landfills or incineration by 2020. Los Angeles is 90% diversion by 2025.

In Germany, zero waste to landfills is a National goal by 2020. Germany has very strong National policy on waste reduction, recycling, producer responsibility for packaging and waste, aggressive diversion rates, etc. A typical German city/region or planning unit is doing 60-70% diversion, this is not exceptional in Germany, and many cities/regions are higher.

Looking at cities in the US that are leaders in this direction, with high diversion rates and zero waste as a longer range goal, they all have certain program elements in common. I would add Seattle to this list. Although not quite as advanced, striving to meet 60% diversion, they are often cited as a model in the USA, and share these same program elements. German cities/regions also have the same program elements, (and a few more based on German and EU policy and legislation), as follows:

1. Flow control- One way or another, they are able to direct the waste and recyclables from their communities to specific facilities. It cannot be sent to a less environmentally protective system simply because it costs less. There is normally an Authority or Public Utility to operate and manage the system. They collect the user fees needed to support the administration, operations and maintenance of the system.
2. Collection control- Typically, there is control of the collection with fleets operated by the municipality, the Regional Authority, or public utility districts that handle waste collection. Seattle is an interesting hybrid since they split the City into two districts and privatize collection; Waste Management is one of their haulers. US Disposal, a subsidiary of Allied Waste was also involved until recently.
3. Pay as you throw (PAYT) or SMART (Save Money and Reduce Trash) is a component of all these systems with higher waste reduction and recycling rates. You can recycle as

much as you want, but you pay for waste disposal. The bigger the waste container you need for your household, the more you pay. These user fees, along with any other revenue streams cover the cost of financing, operating and maintaining the overall system.

4. Biowaste collection- As we recently learned from our waste characterization study, food waste is a large component that is not recycled/composted in many communities in the US. It is, however, an integral part of the system in San Francisco, Seattle, Los Angeles, etc., recycled with the yard waste to indoor composting facilities. In Germany it is typical.
5. Three bin system- One for garbage, one for biowaste and one for mixed recyclables.
6. Extensive drop off stations- Drop off stations that allow residents, and make it easy for them, to recycle things like electronic waste, household hazardous waste, textiles, scrap metal, construction debris, reusable items, etc. Items that are not part of the weekly or bi-weekly recycling collection process.
7. Special collection days- There may be one or two days a year that you put, for example, electronic and electrical waste curbside for pick up.
8. Construction & Demolition Waste- Local ordinances may be needed to regulate this waste. It is a significant quantity due to weight, often wasted, and not recovered. We are seeing some of this, but it is still the exception, not the norm. In Germany 88% is recycled, it is the norm, not the exception.
9. Possible bans on certain products in the waste stream- As an example, the ban on Styrofoam take-out containers in San Francisco's restaurants and grocery/food outlets.
10. Extensive public education and public relations, coupled with enforcement- We have discussed this already. On the San Francisco web site, there is a link to "report Styrofoam use".

San Francisco and Los Angeles are both looking at "conversion technologies", like pyrolysis or gasification to treat the final 25+/-% of waste, to close the gap, get closer to zero waste. They are not considering waste to energy. In Germany there has been a National ban since 2005 on organics to landfills. Waste going to landfills must be "treated", and rendered inert. Almost all German systems use waste to energy and/or biological mechanical stabilization systems, as the treatment methods. The biological mechanical systems are an alternative where WTE is less socially or politically accepted. These are considered recycling facilities. They dry and reduce the bulk and water in the waste by 30%, making it much easier to process and separate more recyclable fractions and any used batteries. This pushes the reuse/recycling rate up to perhaps 85%, the remaining 15% is the fuel pellets produced. They are burned in cogeneration facilities with other fuels like coal. So, this system is arguably at zero waste. However, the WTE plants in Germany also operate on very strict emission standards, bottom ash is reused as cement for things like highway sound walls, after recovery of metals, typically they also have district heating for thermal recovery. The energy

recovered is considered renewable energy. Only fly ash remains, it is stored in old salt mines as part of mine reclamation, so this model is arguably at zero waste also.

This is just a quick outline, but there seems to be a consistent set of program elements in the systems that are achieving maximum reduction/reuse/recycling and recovery, and minimizing landfilling as the least desirable alternative in the waste hierarchy.