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Dispatches from Europe: The uncertain future of waste to energy

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Anyone engaged in waste-reduction policy has surely witnessed the intense debate that has been raging for decades around the notion of burning municipal solid waste to create power.

Active lobby groups around the world regularly campaign for additional incineration capacity, citing the importance of reducing waste to landfill and finding ways to turn some waste material into electricity or heat. We also hear producer responsibility organizations and brand owner groups asserting that energy from waste (EFW) is part of an integrated solution to managing material that is not currently recyclable, or that can be recycled only at an excessive cost.

But at the same time, many advocates of recycling have long been opposed to the process, noting that EFW systems inevitably burn up material that could be recovered by the job-boosting diversion systems already in place. They also note that using material for its “highest and best use” will be far more environmentally friendly than sending it to energy production.

A look at the current dialogue around EFW in Europe, where the strategy has been developed more than perhaps anywhere else in the world, offers insights into how the debate may evolve in the coming years.

The main takeaway: In a world where the economics of energy are undergoing significant change, the concept of using waste as a power source may be becoming outdated.

Shifting tone among EU leaders

Worldwide, there are approximately 800 EFW facilities converting more than 140 million tons of waste each year into energy, according to an FAQ sheet compiled by the large EFW company Covanta.

Canada’s EFW infrastructure is minimal, consisting of eight operating facilities. By comparison, at the end of 2016, the U.S. had 77 EFW plants that generated electricity in 22 states (concentrated mainly in Florida and the Northeast).

In Europe, which has been recognized as the world leader in the EFW market, a recent study (<http://forum.eionet.europa.eu/nrc-scp-waste/library/waste-incineration>) showed that between 2010 and 2014, incineration capacity in the 28 current European Union (EU) countries plus Switzerland and Norway increased by 6 percent to 81 million metric tons and that three-quarters of this capacity is in France, Germany, Italy, the Netherlands, Sweden and the U.K.

Having worked in the waste management industry in North America for many years, it was always my impression that EFW was very much endorsed in Europe and considered an important part of the waste hierarchy there. In Europe, after all, landfill space is at a premium. Furthermore, one of the main arguments in support of EFW is that it creates a net positive impact in terms of greenhouse gas reduction and climate change mitigation because it produces energy, thereby displacing the equivalent electricity generated from other sources, generally fossil fuels.

However, as the world — and Europe in particular — begins to move away from carbon-based fuels and toward renewables, the contributions of EFW to the grid will be displacing cleaner low carbon sources of power, which means that the net benefits of EFW will decrease.

When you add to this the fact that more and more scientists are accounting for biogenic carbon emissions from the combustion of biologically based materials, such as wood, in their analyses, the relative performance of EFW worsens even further.

Those factors underpin the reasoning in a significant document released by the European Commission in January in which the body urged caution (<http://ec.europa.eu/environment/waste/waste-to-energy.pdf>) over EFW investment. The language in the Commission's document is clear: Don't rely on financial support from EU or national-level funds, loans and other risk-bearing measures, and only build EFW infrastructure if it does not undermine reuse and recycling efforts.

The main aim of the Commission action is to ensure that the conversion of waste to energy in the EU is in line with the objectives of the EU's larger circular economy plan and is consistent with the existing waste hierarchy principles. The Commission advised member states to consider the "impact of existing and proposed separate collection obligations and recycling targets on the availability of feedstock" for EFW plants, warning that material streams could be limited if circular economy proposals to increase reuse and recycling are successful.

The Commission also stressed the importance of finding the right balance when it comes to EFW capacity in order to avoid the potential economic losses associated with stranded assets, or the creation of infrastructure barriers to the attainment of higher recycling rates. In this regard, the Commission urged member states with low or non-existent incineration capacity to focus their efforts on increasing recycling capacity and developing combined energy recovery in the form of anaerobic digestion.

Perhaps most important, however, is the Commission's call "to gradually phase out public support for the recovery of energy from mixed waste" and "where appropriate, [to redirect] support to higher-ranking processes in the waste hierarchy."

Important financial repercussions

The language coming from the Commission on this topic carries weight because government funding plays a key role in the economic realities of EFW in Europe.

Across the continent, EFW facilities receive funding and other forms of support (including feed-in tariffs, tax exemptions and premium taxes) to produce energy from burning residual mixed waste. These subsidies are a major barrier to the transition towards a more circular economy, as most of the materials involved are recyclable or compostable.

In recognition of this, the Commission advised that EU funds, such as the Cohesion Policy funds or the European Fund for Strategic Investment (EFSI), not be used to finance EFW infrastructure, except for "in limited and well justified cases." At the national level, member states assessing financial support for EFW are advised to ensure that support does not undermine the waste hierarchy by discouraging materials management options that hold the highest potential to optimize energy and material outputs.

The installation and operation of modern high-efficiency EFW is expensive, and it often cannot exist without outside investment. North American enterprises are finding it difficult to compete against landfills, especially now that most of the new landfills are recovering methane for energy more efficiently than in the past.

This recent recommendations from the EU Commission should send a strong signal to municipal and regional governments considering putting money into EFW projects. If nothing else, city, state and federal governments can enact tougher emissions limits, higher efficiency standards and practices and force EFW operators to upgrade pollution mitigation and other operational equipment, sometimes at a significant cost. While this may not be too likely in the current political climate of deregulation in the U.S. and some parts of Europe, the operating term of an EFW facility (20-30 years) should outlast any political campaign or trend.

Effects of innovation

But perhaps the greatest uncertainty for investors is the uncertainty of the fuel itself: the waste needed to power thermal EFW facilities. The nature of waste is ever evolving. Innovation in automatic sorting technology has made it possible to separate small pieces of mixed materials, like plastics, by resin type and even color. Organics collection programs continue to grow and Europe's mandatory source-separation recycling is increasing while extended producer responsibility programs for many wastes are expanding all over the world.

The circular economy of the future draws materials out of the bin and up the hierarchy. Why would you put significant capital behind a system that locks you into supplying a fixed amount of waste for a very long period time?

That seems like a risky investment to me. And the decision-makers at the EU Commission have indicated they feel the same way.

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