

# A Wasted Opportunity

When the waste we create leaves our homes, where does it go? In the EU, 4.8 tonnes of waste were generated by each resident in 2020<sup>1</sup>, 39.2% of which was processed and recycled.<sup>2</sup> The majority (55.6%) arrived at landfill or backfilled, either within its country of origin (32.2%) or exported abroad (67.8%),<sup>3</sup> while a fraction – less than 6.5% – was converted to energy.<sup>4</sup>

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JASON COGLEY, Managing Director, Fiera Infrastructure

This is a profoundly wasted opportunity. In urban municipalities where there is a large concentration of residual household waste, energy-from-waste (EfW) has material advantages over its alternatives, in particular landfill. Efficient EfW conversion reduces the amount of CO<sub>2</sub>e (carbon dioxide equivalent) emitted into the atmosphere compared to landfill, which is a materially positive environmental benefit. EfW requires less space. And, with optimised EfW plant

design, society's residual waste can be converted into reliable baseload electricity generation and residual heat from this process can be used to heat households through district heating networks.

At a time when societies around the globe are looking for ways to reduce residual waste sent to landfill and transition away from fossil fuel-focused energy generation, leveraging EfW technologies to convert waste to energy are important catalysts of



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the circular economy. Technological improvements now mean that the biggest issues associated with EfW, in particular the emission of fine particulate, dioxins and nitrous oxides, are increasingly minimised, thereby improving EfW's environmental credentials even more.

Consider first that the original incinerator was built in Nottingham, UK, in 1874. Back then, the “destructor” would utilise controlled combustion at high temperatures to transform the residual waste into ashes, slag and gas. Imagine a large furnace, underneath which would be an ashpit. The back end connected to a steam boiler and a turbine, while the refuse would begin its journey through the system in a brick-built storage chamber before extracting its calorific value.

Essentially, the first incinerators were large kilns. Without the advantages of precision engineering or the use of sealants, these early examples of EfW were leaky. While the purpose of this process are more or less unchanged – to processing residual household waste – the process itself has evolved considerably. Technological advancements in catalytic filtration such as SNCR

(selective non-catalytic reduction) and, more recently, SCR (selective catalytic reduction), in addition to emissions filtering, make it possible to substantially reduce particulate matter and noxious gases from emissions. The systematic upgrades made to plasma torches also mean that incineration can occur at extreme temperatures (5,000°C to 7,000°C) in sealed reactors, improving combustion efficiency at the molecular level.

The most recent innovation impacting EfWs is the large-scale development of carbon capture projects attached to EfW facilities, extracting significant amounts of CO<sub>2</sub>e from these emissions and dramatically decreasing the fossil-related carbon footprint of EfW technology. Widespread adoption of carbon capture requires public sector policy support in the near term. While carbon trading markets will ultimately form the economic framework against which these projects are financially viable, they are in their infancy. However, the public benefit of such a meaningful reduction in carbon emissions is well aligned with policy objectives at the national and regional level to achieve net zero. EfW facilities with CCuS (Carbon Capture, Utilisation and Storage) are critical in helping governments around the world achieve net zero.



Other new innovations, such as hydrothermal carbonisation (HTC) and dendro liquid energy (DLE) generation, are promising EfW offshoots with low operating costs and near-zero emissions. These are relatively early-stage technologies and, for now, they lack the reliability and scalability of EfW. Like modern incineration, the way these techniques are executed is significantly different from their progenitors.

Investors in infrastructure that are revisiting their exposure to this relatively understated asset class are being enticed back in by converging secular trends that are bolstering the attractiveness of the sector. Geopolitical turbulence, together with the diversification and nearshoring of sustainable energy sources, is working to place EfW higher up the public policy priority list. The prospect of thinner exporting contracts and a higher cost of import also means that the RDF (Refuse Derived Fuel) market is shrinking and as such industry is anticipating domestic feedstock inventories that will be higher than we've seen previously.

The complex nature of the waste supply chain provides investors with additional opportunities to deploy capital across a plethora of projects while also diversifying intra-industry. In the UK, EfW companies like Cory in London have developed a nexus of energy recovery technology and waste transfer stations, alongside Thames-based tug infrastructure, to streamline waste collection and divert it from landfill, while downstream companies like Augean are able to resolve the environmental impacts of the EfW process while also addressing niche sub-industries through the processing and treatment of hazardous wastes that cannot be recycled or

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converted to electricity. Elsewhere, companies like Captis Energy in the United States are tackling the circular economy from a different angle by capturing and repurposing the methane emitted by landfills and using it to generate baseload renewable power, thereby supporting environmental aims through the reduction in greenhouse gas emissions.

Education will be one of the most substantial hurdles standing in the way of private capital allocation to EfW. Public decision-makers must appreciate that new developments will mean a commensurately higher proportion of grid energy can be provided by environmentally progressive technologies like EfW and landfill gas. The absence of new public-private partnership (PPP) projects promoting these technologies should not be treated as meaning no support is needed; instead an acknowledgement of their environmental benefits, scalability, reliability and stable energy supply should motivate policy makers to create frameworks that drive additional private sector investment.

The status quo with respect to waste is to throw it away and forget it, but we think investors will find treasures in the trash. As the industry expands and diversifies, supported by an attractive return profile and the impending long-term demands of achieving net zero, we must not disregard the opportunities afforded by capitalising effective waste management.





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## Endnotes

- 1 European Environment Agency, Waste and recycling (28 August 2024)  
<https://www.eea.europa.eu/en/topics/in-depth/waste-and-recycling#:~:text=On%20average%2C%20each%20European%20produces,20%25%20of%20their%20municipal%20waste.>
- 2 European Commission – Eurostat, Waste Statistics (4 September 2024)  
[https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Waste\\_statistics#:~:text=Highlights&text=4.8%20tonnes%20of%20waste%20were%20generated%20per%20EU%20inhabitant%20in%202020.&text=39.2%20%25%20of%20waste%20were%20recycled,in%20the%20EU%20in%202020](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Waste_statistics#:~:text=Highlights&text=4.8%20tonnes%20of%20waste%20were%20generated%20per%20EU%20inhabitant%20in%202020.&text=39.2%20%25%20of%20waste%20were%20recycled,in%20the%20EU%20in%202020)
- 3 Ibid
- 4 Ibid

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