LONDONASSEMBLY

Environment Committee

Holding the Mayor to account and investigating issues that matter to Londoners

Waste: Energy from Waste

February 2018

EMBARGOED UNTIL THURSDAY 15 FEBRUARY 2018, 06.00AM

Key findings

- Despite efforts to cut waste and increase recycling, more than half of London's waste ends up being incinerated. The amount of waste sent for incineration (known as "Energy from Waste") has more than doubled in the last decade, reaching nearly two million tonnes in 2017.
- Burning waste takes materials out of the circular economy, releases carbon into the atmosphere and may have negative health effects.
- But it also generates electricity, can provide heat for local homes and businesses, and reduces the amount of waste sent to landfill.
- Energy from waste technology (EfW) is here to stay, at least in the medium term.
- But while London has the EfW capacity to meet demand, it currently exports approximately over half a million tonnes of waste for incineration a year.
- London needs to become self-sufficient in managing the waste it generates, reducing waste sent to EfW as population grows.
- The Mayor intends to regulate London's energy from waste sector by limiting its carbon emissions and maximising the energy benefits it can generate.
- London must begin to limit not only the amount but also the type of waste it sends to EfW. As London strives to be greener, there are further steps the Mayor should take to manage the environmental impact of EfW in the short term.

This report completes the London Assembly Environment Committee's investigation into waste management. Previous reports in 2017 considered the circular economy and household recycling and all three topics will be launched as a final report in spring 2018, with recommendations. If you have any questions, please contact: environment.committee@london.gov.uk

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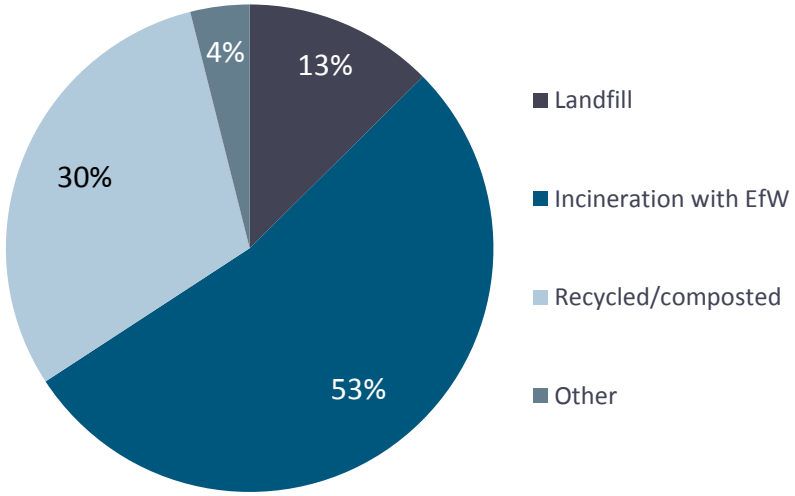
London's increasing use of EfW

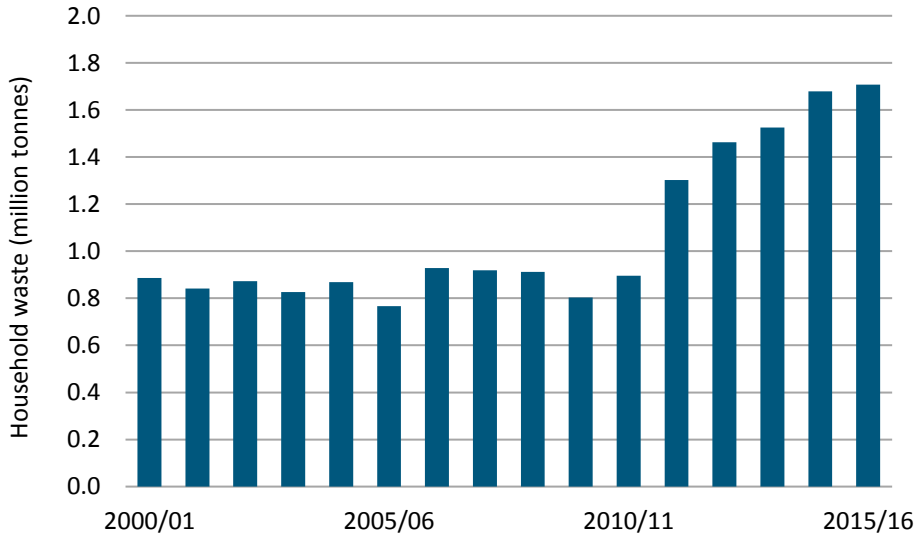
Energy from Waste (EfW) disposes of waste and generates electricity and heat. For waste that cannot be recycled, incineration at an EfW facility is the main alternative to landfill. In an EfW plant, waste is burnt to produce steam, which drives turbines to generate power. Excess heat can be stored or transferred to local consumers. Some of the ash and other residue is recycled, but some that is hazardous is still sent to landfill.

Diagram 1: London burns more waste than it recycles [1]



London burns over half of its waste and without major change, will continue to use this method of waste management for the foreseeable future. Two million tonnes of London's waste was sent to EfW last year, more than doubling in the last decade.[1] This level of incineration shows no sign of slowing down. The Mayor has pledged that no recyclable or biodegradable waste should be sent to landfill by 2026. The financial and environmental cost of landfill is also now a major disincentive. Even with a Mayoral target of a 65 per cent recycling rate, incineration is likely to remain the main form of residual waste management in London.

Diagram 2: Energy from Waste has significantly increased in the last decade [1]



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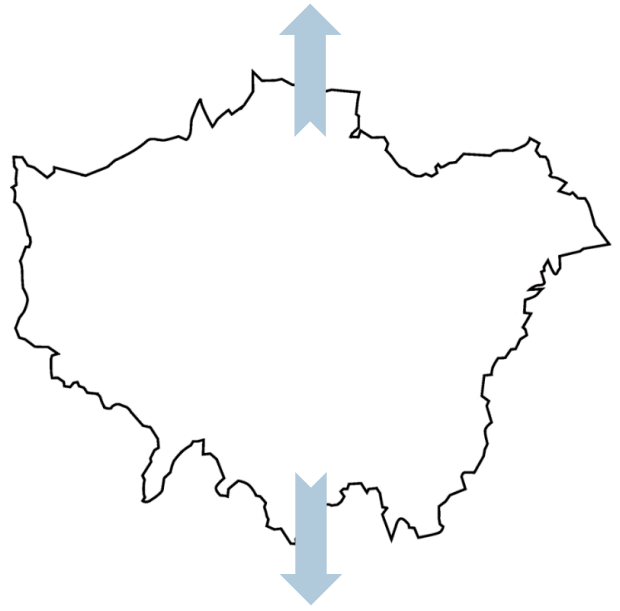
London's EfW capacity

If London hits its recycling targets, its existing EfW capacity should be enough to handle the residual, non-recycled waste. However, failing to reach the planned 65 per cent level of recycling would leave an excess of residual waste. Research commissioned by EfW operator Cory found an EfW capacity gap of 0.9–1.7 million tonnes by 2030, because it assumed a lower (54–60 per cent) recycling rate.[2] This could be the equivalent of another two or three incineration plants. EfW would not be the only option: black bag waste could be sorted after collection to separate out recyclable materials, reducing the tonnage to incinerate and the need for new incinerators.

Although there are several EfW facilities in London, waste is still exported outside the capital, including being sent abroad. London currently has five EfW plants, including the UK's biggest site at Belvedere, but exports in excess of a million tonnes of waste for incineration to the continent.[3] Exported waste has seen a dramatic rise over the past five years and it can represent a value for money option for London boroughs. However, it is not likely to be sustainable in the medium term, due to waste export restrictions coming into force in China and Europe. China, as part of its own circular economy programme, is looking to become more self-sufficient and has raised the standard of the waste it imports. As a result, the country now restricts imported plastic waste from the UK. The UK does have alternative markets on offer in Europe though Viridor reports that these have now "hardened" and are now less attractive since the UK's decision to the leave European Union.[4] London, therefore, needs to consider its own waste management capacity.

Diagram 3: London only recycles and disposes of a small proportion of its waste [5]



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Impact of EfW on the environment and public health

Landfill and EfW are the least desirable forms of management in the waste hierarchy. Both destroy materials, including those that could be recycled, and both emit greenhouse gases. For organic waste, such as food and paper, incineration has a smaller greenhouse impact than landfill, because landfill releases much of the carbon as methane, which has a much greater environmental impact than carbon dioxide from burning. EfW also provides energy, and takes up less land. So, EfW is preferred to landfill. However, it is a complex issue. For example, plastic waste in landfill releases very little carbon dioxide and so incinerating plastic is actually more damaging than landfill, due to emissions.[6]

EfW burns recyclable materials that could be used within the circular economy. Burning recyclable materials perpetuates our linear economy model of take-make-dispose and further depletes our natural resources. EfW's opponents argue that it suppresses recycling rates by removing financial incentives for recycling. Creating demand for recycled materials could create a knock-on demand for recycling capabilities and give a boost to the circular economy. A recent example of this effect is the demand for coffee cup recycling.

> "Things go around and around when they are recycled and composted. When they go to incineration, they are lost forever…as we move to an increasingly circular economy, there will be less of a role for incineration to play."
> *Shlomo Dowen, National Coordinator, United Kingdom Without Incineration*.

Investing in more EfW can negatively affect long term recycling rates. This investment needs to be paid for by an assured income stream, usually through contracts with local authorities to pay the EfW operator to take waste. Contracts are often lengthy – the majority are over 20 years. The terms of contracts, such as minimum annual payments, or a low fee per tonne of waste, can undermine the financial viability for the local authority of reducing waste, or sending it to other destinations such as recycling.

Creating energy from burning materials such as food waste and paper is classified as renewable energy,[7] an energy source the Mayor is keen to promote. The Mayor plans to work with London's EfW plants and waste authorities as part of the Decentralised Energy Enabling Programme and there is already engagement with providers. Viridor, an EfW operator, has signed an agreement with the London Borough of Sutton's energy services company, the Sutton Decentralised Energy Network, to supply a maximum of 15 MW of heat from the plant. At full capacity, Viridor's EfW facility can generate up to 26 MW of electricity.[8]

The evidence around the health impacts of EfW remains inconclusive. A recent Public Health England report found little evidence of incinerator-related particulates that could be distinguished from traffic pollution.[9] But a report to the British Society for Ecological Medicine noted a link between incineration and cancers, birth defects and cardiovascular mortality.[10] Furthermore, incineration should not be exempt from London's ambition to improve air quality. It is therefore essential that London burns less organic and plastic waste, as well as recyclable materials.

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Limiting the impacts and maximising the benefits of EfW

London needs EfW facilities, at least for the short term, but there are things we can do to limit their environmental impact and maximise their benefit. The carbon intensity floor measures the carbon impact of energy from waste, which can be offset by producing greater amounts of energy and improving the efficiency of an EfW facility. The Mayor wants to limit the environmental impact of EfW and in his draft Environment Strategy calls for waste authorities to demonstrate how they meet the carbon intensity floor. To maximise the benefits of EfW, the Mayor has requested that all facilities have Combined Heat and Power.[11] But, from our investigation, we believe that there is more that could be done to limit the environmental impact of EfW, as well as maximising its benefits.

Energy derived from waste has its limitations and will require significant work by a range of actors, other than the EfW operator, to reduce our reliance on the national grid. As all of London's EfW facilities begin to produce both heat and power, we were told that there is a trade-off between electricity and heat - taking increasing amounts of heat off will mean less electricity generated.[12] Heat networks—pipes from the generating plant to the buildings to be heated—also need to connect supply with demand, and the landlord or home owners also need to be prepared to pay for the heat. We heard of several 'missed opportunities' to link up EfW capabilities with nearby housing developments. Viridor highlighted that delivering heat requires cross-sector collaboration and long-term planning to get to a point that is economically viable to deliver long-term benefits.[13]

Recyclable materials are unnecessarily going to incineration, including materials that are potentially hazardous to health when burnt. We heard that waste is not sorted as part of the EfW process and EfW operators feel that recycling separation is the responsibility of households, businesses or local authorities. However, with separation so low in London, recyclable materials are unnecessarily going to incineration.

> "It should also be recognised that about 64 per cent of inputs into EfW is deemed as renewable; it is biogenic material. The remainder of that is the fossil fuel material, which is the carbon that we have to work hard to move away from."
> *Dan Cooke, Director of Regulatory Affairs, Viridor*.

Because not all boroughs offer separate food waste collections, food waste is being burnt rather going to other processes which are more environmentally beneficial, such as anaerobic digestion. Anaerobic digesters in London are under-utilised. By not checking the content of waste received, EfW sites are potentially burning the resources of the future – a hindrance to the circular economy as well as releasing carbon emissions into the environment. Encouraging separation by the EfW facilities, as well as at all points along the disposal chain, would benefit the environment and health by reducing carbon and other emissions and increasing recycling.

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The Environment Committee examines all aspects of the capital's environment by reviewing the Mayor's strategies on air quality, water, waste, climate change and energy.

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For further information about the work of the Environment Committee, and to see our current investigations, visit our website.

About the London Assembly

The London Assembly holds the Mayor and Mayoral advisers to account by publicly examining policies and programmes through committee meetings, plenary sessions, site visits and investigations.

As well as examining the Mayor's actions and decisions, Assembly Members act as champions for Londoners by investigating issues that are important to the capital.

Assembly investigations are carried out by cross-party committees which cover vital areas like transport, policing, housing and planning, the economy, health and the environment. The Assembly can press for changes to national, Mayoral or local policy.

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[1] DEFRA (2017) *Local authority collected waste management – annual results 2016-17,* available online at https://www.gov.uk/government/statistics/local-authority-collected-waste-management-annual-results [accessed on 8/2/18]

[2] Evidence submitted by Cory in response to the call for evidence

[3] SLR (2017) *London Plan Waste Forecasts and Apportionments* available online at https://www.london.gov.uk/sites/default/files/task_3_-_strategic_waste_data.pdf [accessed on 8/2/18]

[4] Evidence from Dan Cooke, Viridor, meeting of the Environment Committee, 7 November 2017

[5] SLR (2017) *London Plan Waste – Forecasts and Apportionments, Task 3 – Strategic Waste Data,* available online at https://www.london.gov.uk/sites/default/files/task_3_-_strategic_waste_data.pdf [accessed on 13/2/18]

[6]DEFRA (2014) *Energy from waste – A guide to the debate (revised version)* available online at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/284612/pb14130-energy-waste-201402.pdf [accessed on 8/2/18]

[7]Renewable Energy Association (2011) *Energy from Waste – A guide for decision makers* available online at https://www.r-e-a.net/pdf/energy-from-waste-guide-for-decision-makers.pdf [accessed on 13/2/18]

[8] Evidence from Viridor

[9] Douglas et al. (2017) *Estimating Particulate Exposure from Modern Municipal Waste Incinerators in Great Britain,* available online at http://pubs.acs.org/doi/full/10.1021/acs.est.6b06478 [accessed on 13/2/18]

[10] Thompson, J. and Anthony, H. (2008) *The Health Effects of Waste Incinerators,* available online at http://www.bsem.org.uk/uploads/IncineratorReport_v3.pdf [accessed on 13/2/18]

[11] Mayor of London (2017) *London Environment Strategy – draft for public consultation,* available online at https://www.london.gov.uk/sites/default/files/london_environment_strategy-_draft_for_public_consultation.pdf [accessed on 13/2/18]

[12] Evidence from Tim Rotheray, Director of The Association for Decentralised Energy, meeting of the Environment Committee, 7 December 2017

[13] Evidence from Dan Cooke, Viridor, meeting of the Environment Committee, 7 November 2017