



# Energy from Waste **BRIEFING**

## Energy from waste (EfW)

### Summary

- **‘Energy from waste’ (EfW) should only be used when waste is unavoidable and cannot be reused, recycled or composted:** Although emissions from EfW facilities are over **40 times** lower than from landfill, **90%** of the materials that end up in incineration plants and landfills could be recycled or composted, which offers even lower emissions and is more resource-efficient.
- **Evaluate the need for EfW locally:** Waste management contracts can be **decades long**. This can reduce councils’ flexibility to change their use of EfW. Demand for EfW and the composition of the materials being sent to EfW facilities are likely to change in line with new government policies such as separate food waste collections and a deposit return scheme. Councils should factor this in before designing new waste strategies, signing new contracts and making infrastructure decisions.

### Background

- **What is EfW and what are the different technologies available?** ‘Energy from waste’ (EfW) refers to burning waste to generate heat and electricity for use in homes and businesses. There are several different methods for different waste types, ranging from incinerating non-recyclable plastic to anaerobic digestion of food and animal products. **Anaerobic digestion is not the same as composting**, which is an aerobic process.
- **EfW in the waste hierarchy:** The “**waste hierarchy**” ranks waste management options according to what is best for the environment. Energy from waste is in the penultimate tier, below reduction, reuse and recycling, and above disposal without energy recovery, e.g. landfill. Where waste is unavoidable and cannot be recycled, the most efficient way to manage it is to use it to generate energy.
- **The role of EfW by local authorities:** There are between **50 and 60** energy recovery facilities in the UK. EfW accounted for **48%** of Local Authority Collected Waste (LACW) management in 2020-2021. LACW covers **both** municipal (household/business) and non-municipal (construction/demolition) waste.
- **EfW decarbonisation:** While greenhouse gas emissions from overall waste management have been **decreasing steadily**, EfW emissions **continue to rise**. As there are **no viable low-carbon alternatives** to EfW, decarbonisation will require all new and existing plants to be fitted with carbon capture and storage **by 2050 at the latest** to hit our net zero target.
- **Local opposition to EfW:** There can be strong **opposition** to EfW from local **residents** of areas with proposed and existing EfW incineration plants. **Common reasons** for opposition include perceived negative impacts on **air quality, local traffic congestion, loss of view, odour**, and a preference for measures promoting greater rates of recycling.

- **Concerns about air quality and odour:** Air pollution and odour are oft-cited objections to new EfW facilities. A [report](#) from environmental group Zero Waste Europe in 2015 found that air pollution is “an unavoidable consequence of waste incineration” and can “cause well-known respiratory diseases, cancer, immune system damage, and reproductive and developmental problems”. However, Public Health England found that air pollution from modern, well-run EfW plants is [very small](#) and its effect is [negligible](#). To reduce public concern, it is essential that EfW facilities invest in the most up to date technology available.
- **Using EfW only when necessary:** EfW emits [more than 40 times less](#) greenhouse gas than [landfill](#). However, more than [90%](#) of the materials that are incinerated or put in landfill could have been recycled or composted. Relative to more appropriate waste management options such as recycling, EfW is one of the [most expensive](#) and [inefficient](#) ways to treat waste, especially if the composition of the materials has less biomass within it. Because incineration does not turn material into energy very efficiently, it can be more resource efficient and better value for money to focus on earlier stages of the waste hierarchy, such as recycling and reuse, which can save up to [five times](#) the amount of energy produced by burning waste.
- **Locked into long-term contracts:** EfW [contracts](#) can be decades long, which reduces councils’ flexibility to change whether and how they are used. Such contracts will assume that the amount and type of waste supplied to plants will remain consistent. There is a [risk that energy from waste can compete with](#) recycling for material. This can be avoided by ensuring that contracts, plants, and processes are flexible enough to adapt to changes in waste levels and composition. Although many local authorities have already signed up to long-term contracts, flexibility should be a key consideration for future waste management agreements.

### Government policy

- **The [Environment Act 2021](#) will standardise waste collections across England and ensure weekly separate food collections at council level.** The aim is to prevent food waste and recyclable material from being incinerated or going to landfill. The Act also included measures to increase recycling which will save recyclable plastic from incineration. Defra is due to publish a ‘Waste Infrastructure Roadmap’ in 2022 which will set out anticipated waste arisings to 2035 in light of the packaging and waste collection reforms. The intention of this roadmap is to provide a signal to investors and local authorities as to where there is considered to be a likely over or under-provision of waste management capacity so as to target future investment and better adhere to the waste hierarchy.
- **Defra has set a [target](#) to reduce residual waste by 50% by 2042 from 2019 levels (excluding major mineral waste).** Residual waste is the waste that is left once all other waste has been either prevented, reused, or recycled further up the waste hierarchy. The

commitments made in the Environment Act to improve recycling in England, such as the introduction of a deposit return scheme, recycling labelling, and standardised waste collection, will significantly reduce current levels of residual waste by improving recycling rates. Meeting our residual waste reduction target will necessarily reduce the demand for residual waste management such as landfill and incineration.

- **The [Waste \(England and Wales\) Regulations 2011](#) require waste producers and everyone involved in waste management to declare they applied the waste management hierarchy when transferring waste.** [This document](#) provides guidance on the regulations.

### Ideas and resources

- **Understand your options:** Knowing if and how EfW can fit into your waste management system will require you to reflect on your council's overall waste objectives and the breakdown of your different waste streams. Organisations such as the [Energy Saving Trust](#), [Local Government Association](#), and the [Environment Services Association](#) have resources and guidance available on EfW to help you understand your options. The waste management companies you engage with will also be able to offer advice on how to move your waste up the hierarchy.
- **Read the government's EfW literature:** Alongside its many policy commitments to improve recycling in England, the government has published helpful guidance, **such as:**
  - [Energy from Waste: Guide to the Debate 2014](#) provides an overview of what EfW is, the terminology and policy surrounding it, as well as its pros and cons.
  - [Waste Management Plan for England 2021](#) provides an analysis of waste management in England, an overview of government strategy, including how we are meeting the objectives of the Waste (England and Wales) Regulations 2011.
  - Finally, the [25 Year Environment Plan 2018](#) includes plans to reduce waste and increase uptake of EfW where reduction is not possible, maximise the efficiency of EfW, and minimise greenhouse gas emissions from EfW.

### Conservative case studies

- **[Dudley County Council](#) implemented the most stringent air pollution measures:** The council worked closely with Martin Engineering Systems to redevelop an incinerator site, making it a state of the art energy plant. By investing in the most modern flue gas cleaning systems, the plant can better the most stringent regulations set by EU directives and the recommendations of the Environment Agency. The plant is expected to power over 15,000 homes in the local area and is capable of incinerating 900,000 tonnes per annum of household and light commercial waste.

- **Cornwall Council's EfW partnership provides funding for community projects:** The partnership, whose facility can generate enough electricity to power up to 21,000 homes at full capacity, also funds community projects through a trust composed of local residents and councillors; it provides grants to community groups, voluntary organisations and individuals for the lifetime of the plant.
- **Lincolnshire County Council will save £30 million through EfW:** The partnership with FCC Environment has drastically cut the amount of local residual waste which would have otherwise gone to landfill and saved the council money in the process. The plant has also produced 38,000 tonnes of ash that can be used in the construction of local roads, and generates enough electricity to power over 29,000 homes. The partnership operates a Community Liaison group of local stakeholders which meets every other year.

