

Stop, Sort, Burn, Bury?

Independent Review of the Role of Incineration in the Waste Hierarchy in Scotland

Report

May 2022

Foreword from Dr Colin Church, Chair of the Independent Review

I was honoured to be asked in November 2021 to lead the independent review into the role of incineration in the waste hierarchy in Scotland. How we address the challenges of moving from a linear economic model to a low-carbon, more circular economy is a passionate interest of mine, and the role of incineration in that move is one key challenge.



As Scotland seeks to make this move, the prominence of incineration has grown. The ban on landfilling biodegradable municipal waste from 2025 has concentrated many minds, and incineration is rightly a fundamental element of the approach to meet it. At the same time, concerns have been raised about the impacts of incineration on human health and the environment. Modern plants are far from the polluting monstrosities of the past, now being required to meet stringent emissions standards to protect human health and the environment from airborne harm. But burning waste also produces carbon dioxide, a greenhouse gas, so allowing it to be **freely emitted in the long term is incompatible with Scotland's desire to reach net zero carbon emissions.** There are also concerns as to whether a high level of incineration can act as a constraint on greater waste prevention and recycling.

At the same time, the resource and waste management system is complex and interdependent. It is impossible to consider one aspect of it (such as incineration) properly in isolation from the others (waste prevention, recycling, etc). I must admit to having been more than a little daunted to be asked to do so in a little over four months! It has indeed been a difficult challenge, especially in the light of the lack of data in some crucial areas and whilst other parts of the system are also in motion. However, the Report before you now is as good as it could be in the circumstances, and I believe it offers some clear messages to the Scottish Government and all stakeholders on the current and future role of incineration in the waste hierarchy in Scotland.

I am immensely grateful to all the individuals and organisations who provided input to the Review via submissions to the Call for Evidence and through online and in person meetings. Their insights and evidence, and their willingness to share them with me, enabled this Review to deliver its report within the timescales laid down by the Minister.

Finally, my thanks to the team who supported me so ably in this task and without whom this report would not exist.



Dr Colin Church CEnv FIMMM CRWM MCIWM
Independent Chair of the Review

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- Inability of the model to shed light on the balance between larger centralised facilities and smaller decentralised facilities, such as the economics and carbon emissions of transporting waste.

3.5 Risk Of Lock-In And Stranded Assets

Lock-in is where the development of residual waste treatment infrastructure with a long operational life, such as incineration, limits the treatment of waste further up the hierarchy. This can come about nationally if more capacity is built than, over time, is needed as an economy moves towards a more circular model.

This emergence of excess capacity over time has been the experience of some northern European countries³⁶. This has been handled in many cases by importing RDF from elsewhere to make up volumes. However, doing this in Scotland would not be consistent with the overall resource and waste management policy.

It can also happen on a more local basis because, in order to finance the infrastructure, long term residual waste supply contracts with local authorities may have guaranteed minimum amounts with either financial penalties for not meeting them or bonuses for meeting them. If set at too high a level, this can constrain local recycling or waste prevention activities as the penalties (or missed bonuses) that might result are viewed as too expensive.

The Review received some stakeholder contributions that suggested there is a potential for lock-in effects, including examples where rising rates of incineration were accompanied by declining rates of recycling^{37,38}. Others suggested that the market dynamics would mean that financiers would not invest where there was likely to be insufficient waste. However, where there are high guaranteed minimum tonnages, it is the local authority that carries the risk, not the financier, so this argument does not always stand.

One evidence contribution³⁹ provided the results of some unpublished analysis of English data showing the relationship between rates of incineration and rates of recycling over the past ten years (a period of significant growth in incineration capacity in England). For most combustible materials, this shows an inverse relationship (that is, recycling is dropping and incineration is growing) which might be an indication of the impact of lock-in.

³⁶ *SEPA response to Incineration Review Call for Evidence*. SEPA. (2022). Available at: [Incineration in the waste hierarchy review: call for evidence - Scottish Government - Citizen Space \(consult.gov.scot\)](#)

³⁷ *Friends of the Earth Scotland response to Incineration Review Call for Evidence*. FOES. (2022). Available at: [Incineration in the waste hierarchy review: call for evidence - Scottish Government - Citizen Space \(consult.gov.scot\)](#)

³⁸ *UKWIN response to Incineration Review Call for Evidence*. UKWIN. (2022). Available at: [Incineration in the waste hierarchy review: call for evidence - Scottish Government - Citizen Space \(consult.gov.scot\)](#)

³⁹ Email correspondence between Prof Phil Purnell (University of Leeds) and the Review

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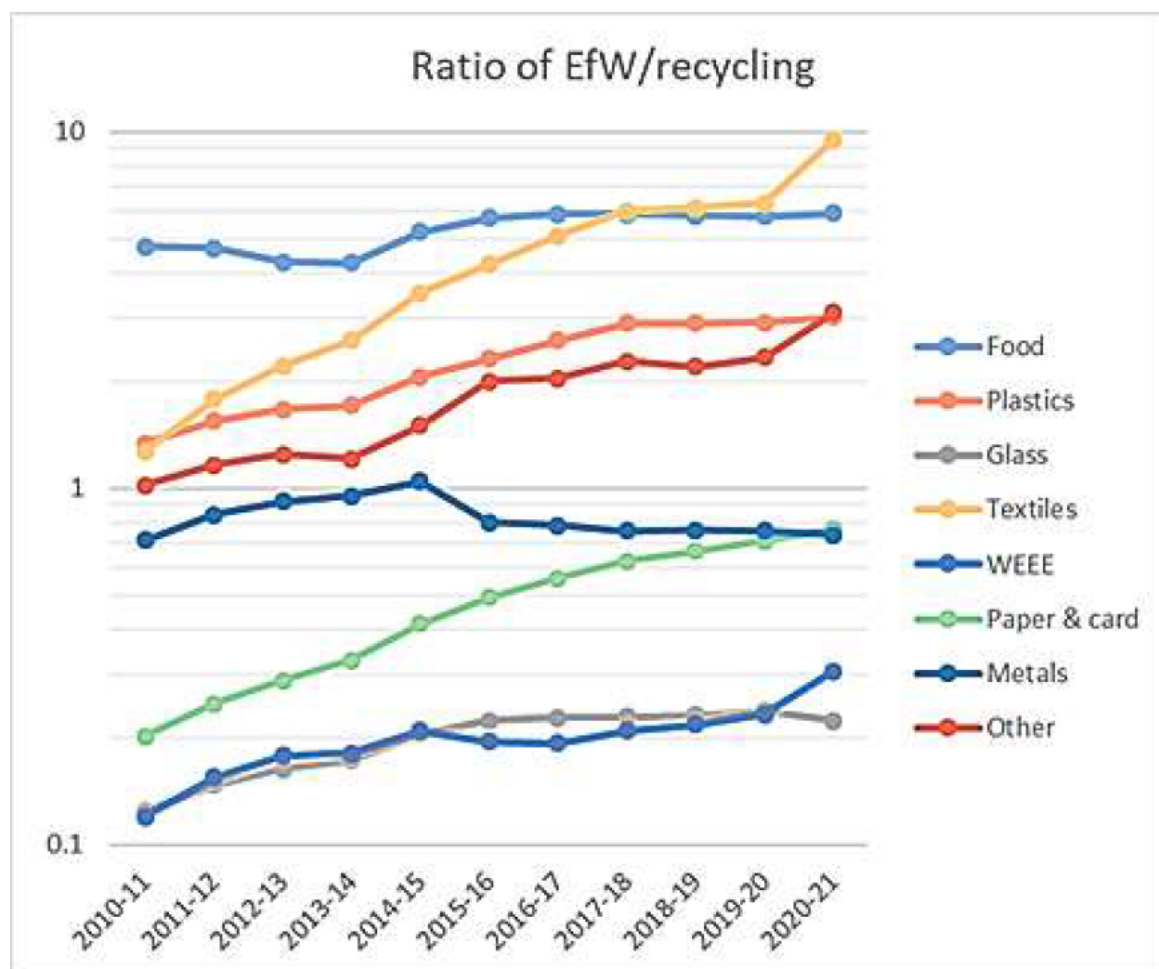


Figure 3: Rates of incineration versus recycling in England, Prof P Purnell (University of Leeds)

The Review was unable to analyse whether or not existing local authority contracts in Scotland contained guaranteed minimum tonnages (or other conditions) that might be problematic in terms of lock-in as it was informed that such contracts were commercially confidential and would not be shared.

Stakeholders generally associated lock-in effects with incineration. For example, one stakeholder suggested that MBT or biostabilisation would avoid lock-in associated with residual waste treatment facilities such as incinerators which cost hundreds of millions of pounds to build. However, the evidence received by the Review suggests that MBT facilities require a consistent feedstock to operate effectively and their costs can range from £50m to £125m, suggesting the potential for similar lock-in effects, or stranded assets if the composition of feedstocks does change.

Stakeholder feedback also raised concerns about the increased risks of lock-in or stranded assets with a reliance on expensive carbon capture and storage solutions to reduce the carbon impacts of incineration.

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3.6 Conclusions On Capacity

Despite the uncertainties outlined above, the capacity analysis suggests that there is likely to be a residual waste treatment capacity gap in 2025, when the Ban comes into force. This will clearly be exacerbated if the ban is extended to include non-municipal biodegradable waste. While this capacity gap could be closed by Scotland achieving its waste and recycling targets, a few stakeholders raised concerns about the likelihood of achieving these targets, drawing on experience and comparisons with other nations as evidence of what could be possible.

The capacity analysis also shows there is a risk of long-term overcapacity beginning from 2026 or 2027, if all or most of the incineration capacity in the pipeline is built, notwithstanding the predicted closure of some facilities in the future.

The analysis demonstrates the difficulty in using infrastructure with long operational lifespans alone to treat residual waste. Scotland appears to have more than enough capacity (in operation and in the development pipeline) to manage its residual waste beyond 2025. Given the risks of overcapacity, Scottish Government should limit the amount of national capacity that is developed. Care will be required to ensure any limits are appropriate and waste can be managed during planned or unexpected events (e.g. from routine maintenance to pandemics) which temporarily reduce capacity or increase waste arisings. For example, additional ‘buffer’ capacity beyond the availability assumed in this model may be necessary.

The Review has considered whether it would be possible to comment on which of the pipeline facilities should be built and which should not, but has decided that in the time and, with the evidence available to it, is unable to do so with sufficient robustness. However, it would point to the discussion in Section 6 for some principles that might be applied.

Recommendation 4 Effective immediately, the Scottish Government should ensure that no further planning permission (i.e. beyond that already in place) is granted to incineration infrastructure within the scope of this Review unless balanced by an equal or greater closure of capacity. The only exceptions to this should be those outlined in Recommendation 10. This change could be embedded in the final version of the fourth National Planning Framework.

The Review recognises that it is not straightforward to terminate or revoke planning permission once it has been granted. However, as a consequence of the Review and the acceptance of Recommendation 4:

- Developers of the schemes categorised as “planning granted” in the capacity analysis report should consider whether there will in fact be sufficient residual waste available to operate as currently foreseen.
- Local authorities should consider using the powers under section 61 of the Town and Country Planning (Scotland) Act 1997 or other powers to terminate existing planning permissions for incineration facilities that have not been pursued.

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Finally, the Scottish Government should consider how best it can discourage undesirable imports of RDF to Scotland that might drive otherwise unnecessary infrastructure capacity development.

Recommendation 5 As part of an overall strategic approach to planning and deploying waste management capacity (see Recommendation 11), the Scottish Government should develop an indicative cap that declines over time for the amount of residual waste treatment needed as Scotland transitions towards a fully circular economy.

To do this, Scottish Government should:

- Consider what other options are available to manage waste (see Recommendation 7) and the regional demand and resilience of residual waste infrastructure (see Recommendation 10).
- Remain cognisant that there may be a justification for local or regional capacity, even where no national capacity requirements are needed.
- Define the scope of the Extended Ban carefully to consider the best management option for specific waste streams (e.g. C&D sorting residues)
- Develop its own modelling capabilities to rapidly update this modelling with new data.
- Work with SEPA, local authorities and the waste industry to improve waste data (for example, C&I waste arisings) and reduce uncertainty in future capacity analyses (see also Recommendation 2).
- Work more closely with developers of pipeline infrastructure to understand the timelines for development, capacity and other needs.
- Consider what buffer capacity may be required in the future and how to provide it.

This work should be carried out with stakeholders.

Some of the biggest problems in recommending a level for the cap are the uncertainties in the data and the lack of a clear understanding of the likely trajectory of residual waste arisings. This in turn depends fundamentally on the policy choices of the Scottish Government within the context of the whole resource and waste management system. It is to be hoped that the forthcoming Route Map to deliver Scotland's resource and waste management targets will provide greater clarity on this.

In the meantime, given the data and modelling issues noted earlier, it is hard to recommend a definitive figure. Clearly, though, it should be on a declining trajectory over time and be below the projected residual waste arisings in the BAU scenario.

Recommendation 6 When negotiating contracts for residual waste management treatment, local authorities should specifically address the risks of lock-in and ensure those contracts are aligned with meeting Scotland's current and future targets on resource and waste management.