ZERO WASTE EUROPE

Waste trade and incineration – debunking an unnecessary alliance

Study

February 2022 – Zero Waste Europe

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Executive Summary

In 2020, the EU shipped 32.7 million tonnes of waste - both municipal and non-municipal - outside of the EU.

This staggering amount of waste shipments took place despite the EU's adoption of the Waste Shipment Regulation (Regulation 1013/2006) and the implementation of the Basel Convention's new amendments - two pieces of legislation meant to limit and control waste shipments in a safe and sustainable way.

This waste ended up in countries all over the globe, causing great environmental and health damage when not treated properly.

To further limit the waste shipped outside its territory, the EU is looking at adopting new waste export bans. In this case, any surplus of waste should be absorbed by intra-EU recycling, prevention, and reuse activities in order to meet the EU's Waste Framework Directive Targets. However, the incineration industry claims that potential waste export restrictions would lead to an increase in the need for incineration capacity.

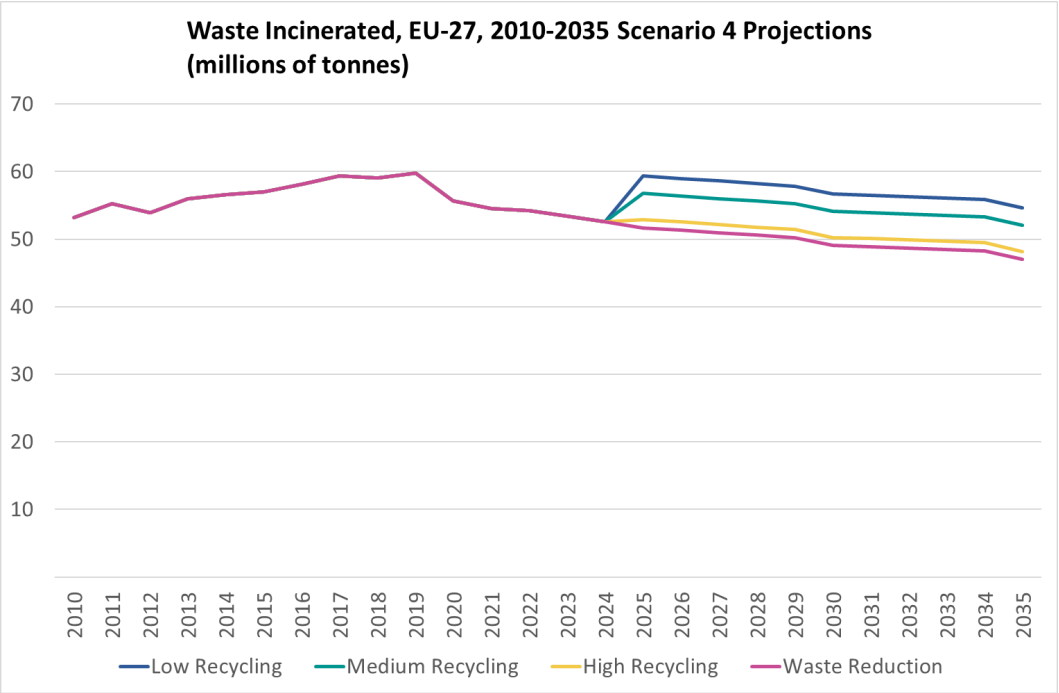
This study demonstrates that the need for further incineration capacity resulting from new waste export bans is neither necessary nor justified.

Our research and conclusions stemmed from two possible ban options and their subsequent scenarios (12 in total):

- **A waste export ban outside the OECD** - would allow waste to continue to be exported to OECD countries such as Turkey or the UK, who together currently take 52% of the EU's exported waste, but potentially eliminate waste going to Southeast Asian countries such India, Indonesia or Malaysia.
- **A waste export ban outside the EU + EFTA countries** -which would limit waste exports from the EU to only Iceland, Liechtenstein, Norway, and Switzerland, who together take only about 10% of the EU's waste.

Out of these 12 scenarios, only three result in tonnages being sent for incineration that go above current levels of municipal waste incineration. In these three scenarios, the ban applies to all waste going outside the EU + EFTA, and the recycling rate of this waste, were it to be repatriated, is relatively low. Therefore, although we model population growth as per EU projections, meeting the EU's recycling, residual waste, and waste reduction targets will create enough spare capacity to incinerate any repatriated waste that cannot be recycled in the EU.

Further, since the scope of the repatriated waste would be municipal as well as non-municipal waste, the fact that it is comparable to current municipal waste incineration tonnages is a strong result. The maximum increase modelled is 13%, which it may still be possible to absorb in spare capacity at existing facilities; or export to allowed countries may increase, which is a possibility not considered in the current modelling.



If the recycling rate of the repatriated waste were indeed this low, other waste would still need to be reduced or recycled in order to meet the EU's Waste Framework Directive targets, thus opening up further capacity in existing incineration facilities. **Therefore, we conclude that the current incineration capacity should be sufficient to deal with the additional waste no longer being exported.**

Taking into account these results, we strongly emphasise that any waste exports restriction could not justify an increase in the EU incineration capacity. Instead, more emphasis should be put on prevention, reduction, and reuse.

EU Waste Export

In 2018, China's national sword policy[1] shed a light on waste trade around the world, with half of the global plastic waste previously going there to be recycled. The restriction imposed by China led the European waste flows to shift to South-East Asia and Turkey. To control and monitor those shipments, the European Union has adopted the Waste Shipment Regulation (Regulation 1013/2006)[2] which, coupled with the Basel Convention, should ensure that shipments happen in a controlled and limited way, following the proximity principle.

However, despite this legislation currently in place, in 2020 the EU shipped 32.7 million tonnes of waste - comprising both municipal and non-municipal waste - outside of the EU. Being the heaviest waste stream, metal waste ranks first (17.4 million tonnes exported), followed by paper waste (6.1 million tonnes) and plastic waste (2.4 million tonnes).

This waste ends up in countries all over the globe. Turkey is now the largest importer of waste from the EU, taking over 40% of EU exports. Waste going to Turkey saw a 45% increase from 2010 to 2020 – a significant part of this waste was previously going to China, until their import ban came into full effect by the end of 2017. In several of the receiving countries, those exports are causing great environmental and health damages by not being treated properly.[3]

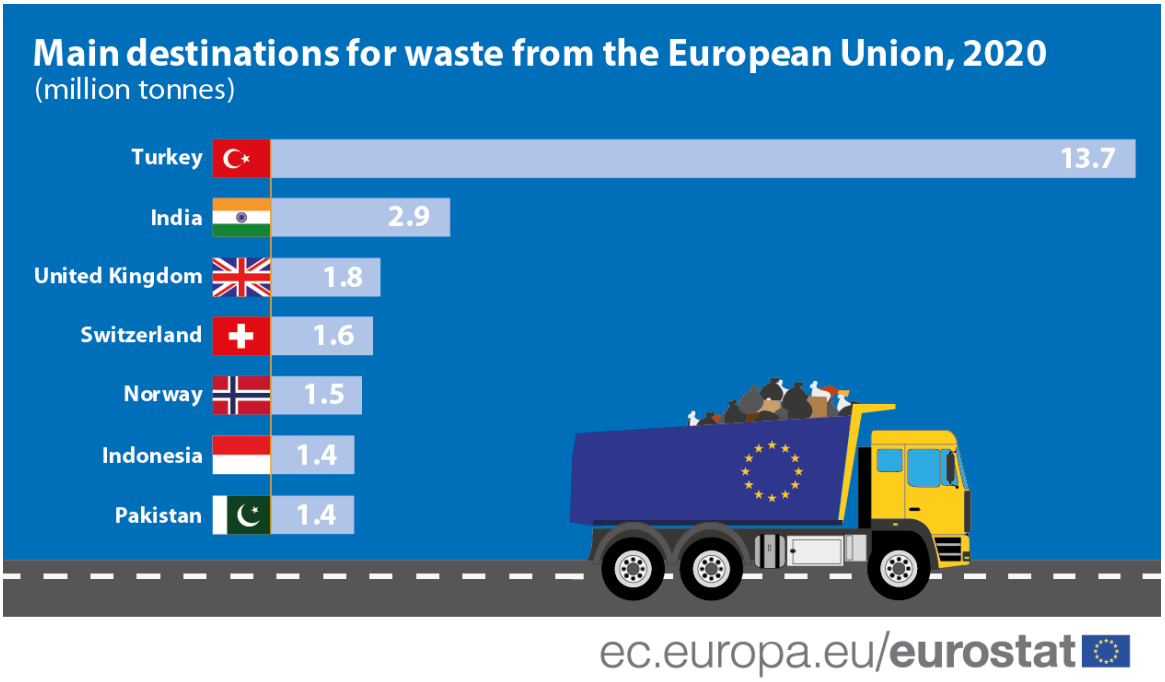


Figure 1. Waste Exports from the EU[4]

Recent changes to the Basel Convention improved the rules for exporting plastic waste, but this remains insufficient, and the EU is now looking at adopting a ban on waste exports outside of its territory. If adopted, the surplus of waste needed to be treated by the EU should be absorbed by recycling, prevention, and reuse. However, the incineration industry claims that those potential waste

[1] World Trade Organization, 'Notification - Committee on Technical Barriers to Trade', *World Trade Organization*, July 2017 (accessed December 2021): docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/G/TBTN17/CHN1211.pdf&Open=True
[2] EUR-LEX, 'Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste', *EUR-LEX*, January 2021 (accessed December 2021): eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02006R1013-20210111
[3] Global Alliance Against Incinerators (2019). Discarded: Communities on The Frontlines of The Global Plastic Crisis (2019). Available at https://www.no-burn.org/wp-content/uploads/Report-April-22.pdf
[4] Eurostat, 'Where does EU waste go?', Eurostat, April 2021 (accessed December 2021): ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20210420-1

export restrictions should lead to an increase in the need for incineration capacity.[5] Through this study, we aim to demonstrate that this need is not justified.

A New Export Ban?

Although details of a potential new export ban are now being discussed at the EU level,[6] here we consider two possible bans:

1. A waste export ban outside the OECD; and,
2. A waste export ban outside the EU+EFTA countries.

The first option would allow waste to continue to be exported to OECD countries such as Turkey or the UK, but potentially eliminate waste going to India, Indonesia, and Pakistan (see Figure 1). The second one would limit waste exports from the EU to only Iceland, Liechtenstein, Norway, and Switzerland, who together take only about 10% of the EU's waste exports. For the purpose of modelling these scenarios, we assume the bans come into effect as soon as 2025, and project forward the tonnages to 2035, the final target year in the EU Waste Framework Directive (2018).

Figure 2 and Figure 3 show the historical tonnages exported, and how much of this would be allowed exports to the OECD and the EU+EFTA respectively, and how much would not be allowed under the two possible bans. There is some year-to-year fluctuation in tonnage, but this is relatively small. For the future projections, we assume an average of the 2010-2020 tonnages would continue to be exported, should no additional bans be put in place.

A total of just under 30 million tonnes of waste is assumed to be exported annually in the future. In the first export ban scenario, 52% of this would be allowed to continue going to OECD countries, while 48% of this waste is assumed to be repatriated in the EU. In the second export ban scenario, only 10% of this would be allowed to continue going to EFTA countries, while 90% would need to be repatriated. Note that in this second scenario, we might expect some increase in current tonnages going to EFTA countries, however, we have not modelled this because it is unlikely that EFTA countries have significant extra capacity.

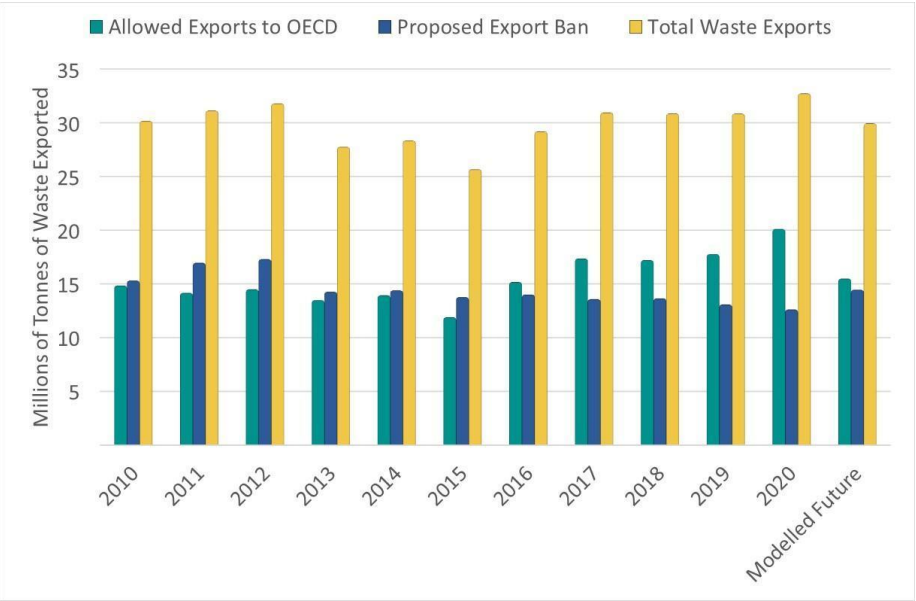


Figure 2. Tonnages of waste exported from the EU from 2010-2020, classified as waste exported to OECD countries which would continue to be allowed (about 52% of the total waste exported) in our first export ban scenario, and waste exported to other countries outside the OECD that would be banned in the future.

[5] Clerens, P. 'It's time for a serious discussion on EU waste exports', *Euractiv*, 11 June 2021. Available at: www.euractiv.com/section/energy-environment/opinion/its-time-for-a-serious-discussion-on-eu-waste-exports
[6] The European Commission's proposal for a new regulation on waste shipments is available at: ec.europa.eu/environment/publications/proposal-new-regulation-waste-shipments_en

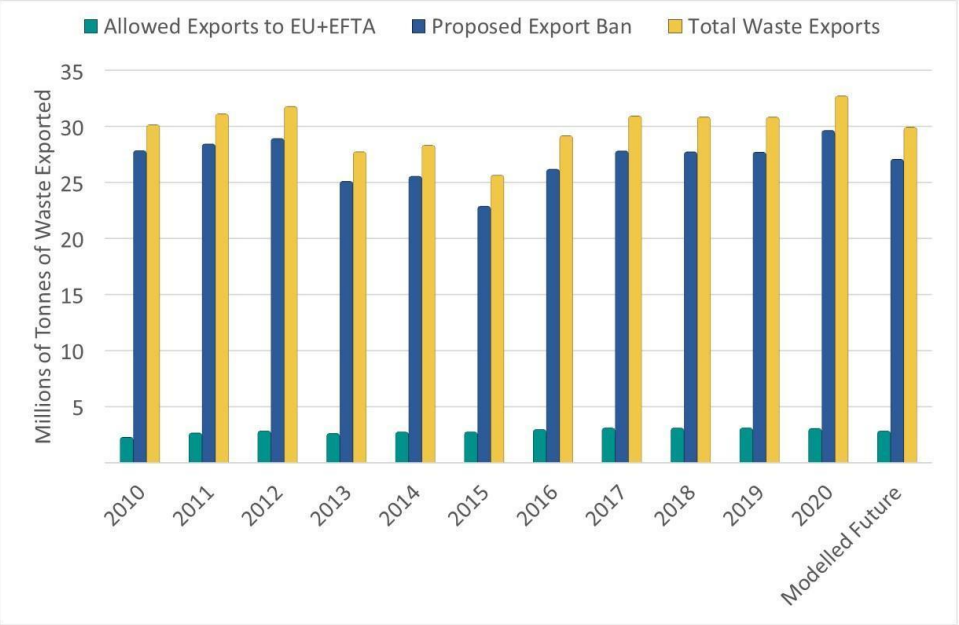


Figure 3. Tonnages of waste exported from the EU from 2010-2020, classified as waste exported to EU+EFTA countries which would continue to be allowed (about 10% of the total waste exported) in our second export ban scenario, and waste exported to other countries outside the OECD that would be banned in the future.

Repatriating Waste

As the EU considers strengthening the Waste Shipment Regulation and implementing new export bans or restrictions, we consider what might happen to the waste currently being exported, which may need to be repatriated in the future, should exports no longer be allowed. No one wants to see an increase in illegal dumping and burning, as was observed in Romania after the Chinese ban took effect.[7] Therefore, a plan needs to be put in place that is consistent with meeting the EU's recycling, residual waste, and waste reduction targets; and that does not rely wholly on incineration.

It is well known that, historically, lower quality recycling was exported to international markets that would accept higher contamination content. This has reduced over time, as waste importers like China and others have become stricter regarding the quality of recyclates they import. This trend is likely to continue in the future. In addition, the quality of recycling sorted in the EU will have to improve in the future to meet recycling targets, thus the quality of exports will improve as well.

As such, we assume that the majority of repatriated waste currently exported for recycling would be recycled within the EU. However, some variation is assumed by material type, as shown in Table 1. In addition, we consider three recycling scenarios: Low, Medium, and High recycling of waste currently exported for recycling. The basis for these scenarios is discussed further below. Any repatriated waste not recycled is assumed to be incinerated, and residual waste currently exported is also assumed to be incinerated if repatriated.

	Low	Medium	High

[7] Gherasim, C., 'After China ban, Romania hit by illegal waste imports', *EU Observer*, 21 April 2021. Available at: euobserver.com/news/151622

Paper and Card	50%	72%	95%
Plastic	20%	33%	80%
Metals	60%	75%	100%
Glass	60%	76%	95%
Other	50%	75%	95%

Table 1. Assumed recycling rate of repatriated waste for each material currently being exported in a Low, Medium and High recycling scenario.

In order to determine the potential future recycling rate of repatriated waste currently exported from the EU, the current recycling rate of each material was considered:

- The paper Medium value is based on the 2019 CEPI "Paper recycling in Europe reached the record level of 72.0% in 2019" statistic;[8]
- The plastic Medium value is based on a European Parliament calculation that shows 32.5% of plastic being recycled in EU countries;[9]
- The metal Medium value is slightly lower than the current EU aluminium collection rate of 85% and on par with the recycling rate of aluminum cans, which is 75%;[10] and,
- The glass Medium value is based on the FEVE "Average collection for recycling rate for glass packaging grew to the record rate of 76% in 2017" statistic.[11]

The Low scenario is then based on the idea that the waste currently being exported is of lower quality than what is recycled in the EU. So it is either not recyclable, or contains high amounts of contamination made of other materials - such as if the material exported as paper and card actually contained some metal and plastic. This would need to be sorted out if the waste were repatriated, and the low-quality and non-recyclable material would get incinerated rather than recycled.

However, since other countries are already cracking down on importing low-quality recycling, the sorting processes within the EU are improving. These sorting processes will need to continue to improve to meet future high recycling targets, with all recyclable materials being sorted correctly and all non-recyclable materials going to incineration (or landfill). Therefore, the High recycling scenario assumes that any contamination made of other recyclable material would be sorted correctly and recycled, e.g. any metal or plastic currently being exported as contamination within paper would be sorted correctly in the first place and get recycled in the EU. Further, with the implementation of Extended Producer Responsibility (EPR) and the high recycling targets, packaging - in particular plastic packaging - will need to become more recyclable than it currently is. There would still be some low-quality material that isn't recyclable, which would again be sorted and incinerated if it were left in the EU rather than exported.

Where exactly we would be within this range would depend on the accuracy of the sorting and quality of sorting outputs at the time when the ban takes effect, as well as on the state of global material markets. If other countries relax their import rules again, we could be heading towards the Low recycling scenario; if the current trajectory in terms of material markets and recycling quality continues, then we could be closer to the High scenario.

[8] CEPI, 'Circular Economy', *CEPI* (accessed December 2021): sustainability.cepi.org/circular-economy

[9] European Parliament, 'Plastic waste and recycling in the EU: facts and figures', *European Parliament*, 2021 (accessed December 2021): www.europarl.europa.eu/news/en/headlines/society/20181212STO21610/plastic-waste-and-recycling-in-the-eu-facts-and-figures

[10] European Aluminium, 'Circular Aluminium Action Plan - A Strategy for Achieving Aluminium's full potential for circular economy by 2030', European Aluminium, April 2020, accessed (December 2021): european-aluminium.eu/media/2903/european-aluminium-circular-aluminium-action-plan.pdf

[11] FEVE - The European Container Glass Association, 'Statistics, *FEVE - The European Container Glass Association*, November 2021 (accessed December 2021): feve.org/about-glass/statistics

EU Municipal Waste

Although the discussion thus far has been about waste exported outside the EU, which includes both municipal and non-municipal waste, many significant changes are ahead in the municipal waste sector that will also have an impact on incineration capacity within the EU. In particular, EU Waste Framework Directive (2018) specifies:

- A 55% municipal recycling target in 2025, as well as a 60% target in 2030, and a 65% target in 2035; and,
- A 10% cap on waste to landfill by 2035.

Figure 4 shows the historical trends in municipal waste recycling and disposal from 1995 to 2019. These per capita figures equate to a total of 224 million tonnes of waste in 2019, of which 60 million tonnes are being incinerated, and an overall recycling rate of 48%.

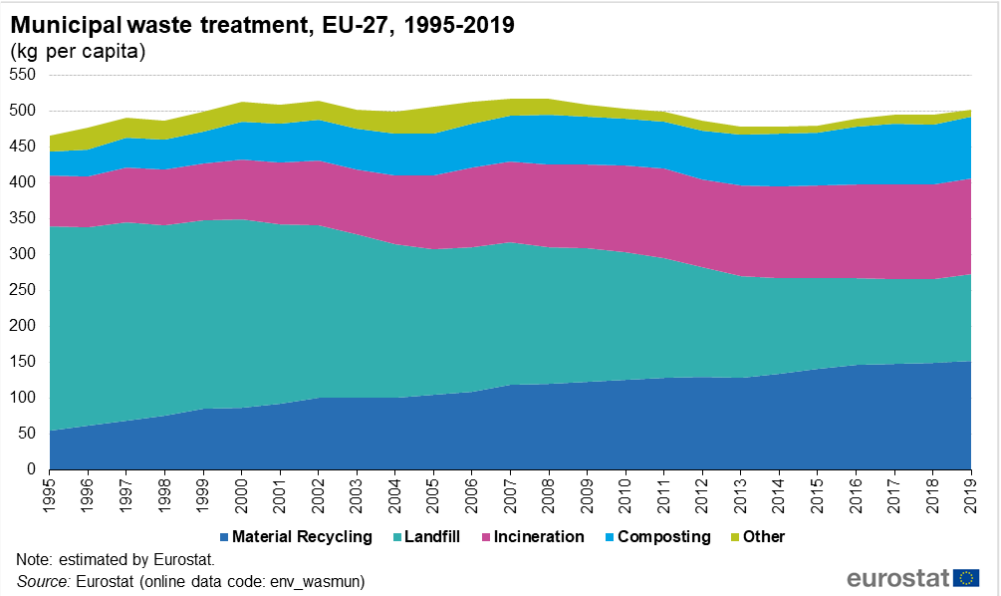


Figure 4. Municipal waste treatment, EU-27, 1995-2019 (kg per capita)[12]

Projecting this forward to 2035, we test two waste growth scenarios:

1. A Business as Usual (BAU) scenario where waste arisings per capita stay constant, and,
2. A waste reduction scenario, where arisings per capita reduce by 10% by 2035.

EU population projections[13] are used to convert between per capita values and total tonnes, which are then comparable to the export values discussed above.

Assuming all the EU targets are met, both the BAU and the Waste Reduction Scenarios (tonnages shown in the Appendix) have relatively constant amounts of waste going to incineration. The increase in recycling required to meet targets effectively offsets the reduction in landfilling to keep incineration stable over time.

[12] Eurostat, 'Municipal Waste Statistics', *Eurostat*, December 2021 (accessed December 2021): ec.europa.eu/eurostat/statistics-explained/index.php?title=Municipal_waste_statistics

[13] Eurostat, 'Population on 1st January by age, sex and type of projection', *Eurostat*, February 2021 (accessed December 2021): ec.europa.eu/eurostat/databrowser/view/proj_19np/default/table?lang=en

Impact on Incineration

To test the potential impact of waste export bans on incineration, we combine all the above scenarios to give us a range of results. To summarise, we are considering:

- Two waste growth scenarios:
  - Business as Usual (BAU), where waste arisings per inhabitant stay constant; and,
  - Waste Reduction, where waste arisings per inhabitant reduce by 10% by 2035;
- Two waste export scenarios:
  - Waste export ban outside the EU+EFTA; and
  - Waste export ban outside OECD.
- Three recycling scenarios:
  - Low, Medium, High recycling of waste currently exported.

In these 12 combined scenarios, the tonnage of repatriated waste that is assumed to be incinerated in the EU is added to the municipal waste projections. Note, that the repatriated waste is not all municipal waste; however, waste export statistics combine municipal and all other waste tonnages, while EU Waste Framework Directive targets apply only to municipal waste. So, the scope boundaries of the work are limited by the available data.

The results still allow us to compare future incineration requirements – including repatriated waste – to current levels of municipal waste incineration. For example, Figure 5 shows the results of 'Scenario 4' which combines the waste reduction projections with a ban on waste outside the OECD. The pink line shows the historical data from 2010-2019, followed by our projected tonnes as described in the sections above. The blue, teal, and yellow lines then show the repatriated waste being added to the municipal waste in the Low, Medium, and High recycling scenarios. In all three scenarios of Low, Medium, and High recycling of repatriated waste, the total tonnage of waste incinerated is similar or less than the tonnages of waste currently being incinerated.

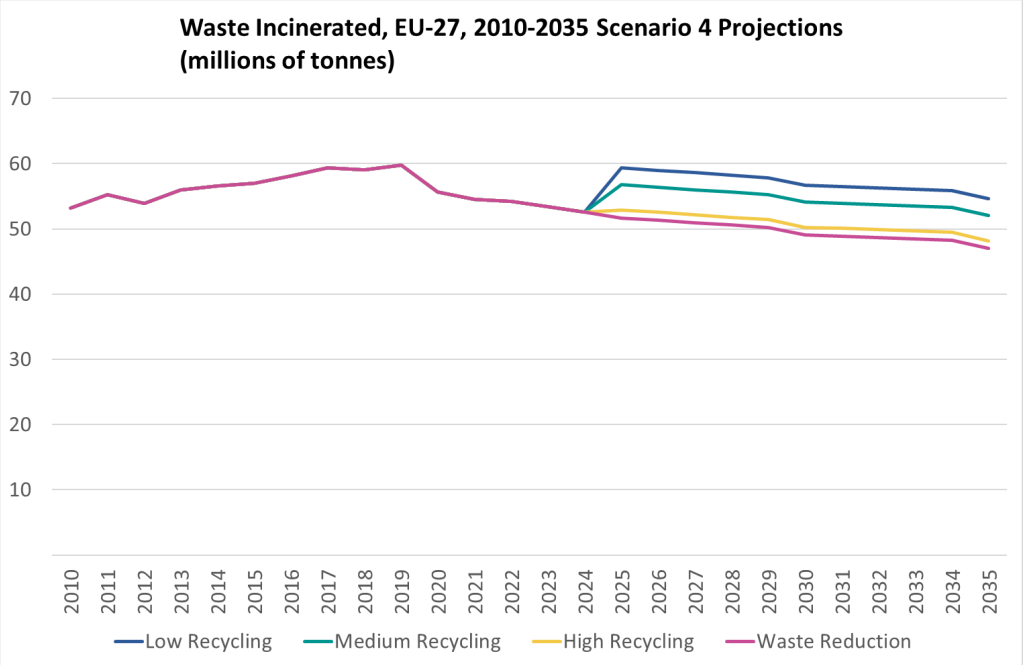


Figure 5. Municipal waste treatment, EU-27, tonnages incinerated from 2010 to 2019, followed by projections from 2020 to 2035. An export ban outside OECD countries is implemented in 2025. The projections assume a reduction in waste arisings by 10% compared to the 2010-2019 average; all recycling rate and landfill targets in the Waste Framework Directive (2018) are met; and Low, Medium, and High recycling of repatriated waste.

The results of the other nine scenarios are shown in the appendix, and in fact, out of all 12 scenarios, only three go above current levels of incineration. These three are all when the ban applies to all waste going outside the EU+EFTA; for BAU waste flows, the Low and Medium recycling scenarios, and with the waste reduction scenario it is only the Low recycling scenario that goes above current levels of incineration. Even then, the tonnage going to incineration is a maximum of 13% more than current levels. This may be able to be absorbed in available capacity at current municipal and non-municipal waste incinerators, or exports to EFTA countries may increase, which is a possibility not considered in the current modelling.

Final Remarks

In this report, we have explored the potential impact of banning waste exports to either countries outside the OECD, or countries outside EU+EFTA. In most of the scenarios modelled, future incineration requirements are similar or less than current levels of municipal waste incineration. Although we model population growth as per EU projections, meeting the EU's recycling, residual waste, and waste reduction targets created enough spare capacity to incinerate any repatriated waste that is not recyclable in the EU.

Since the scope of the repatriated waste would be municipal as well as non-municipal waste, the fact that it is comparable to current municipal waste incineration tonnages is a strong result. Only if the quality of the repatriated waste is so low that a significant proportion of it cannot be recycled, would the tonnages going to incineration be higher than current levels. The maximum increase modelled is 13%, which it may still be possible to absorb in spare capacity as existing facilities; or export to allowed countries may increase, which is a possibility not considered in the current modelling.

Further, if the recycling rate of the repatriated waste were indeed this low, other waste would still need to be reduced or recycled in order to meet the EU's Waste Framework Directive targets, thus opening up further capacity in existing incineration facilities. Therefore, we conclude that the current incineration capacity should be sufficient to deal with the additional waste no longer being exported.

Appendix

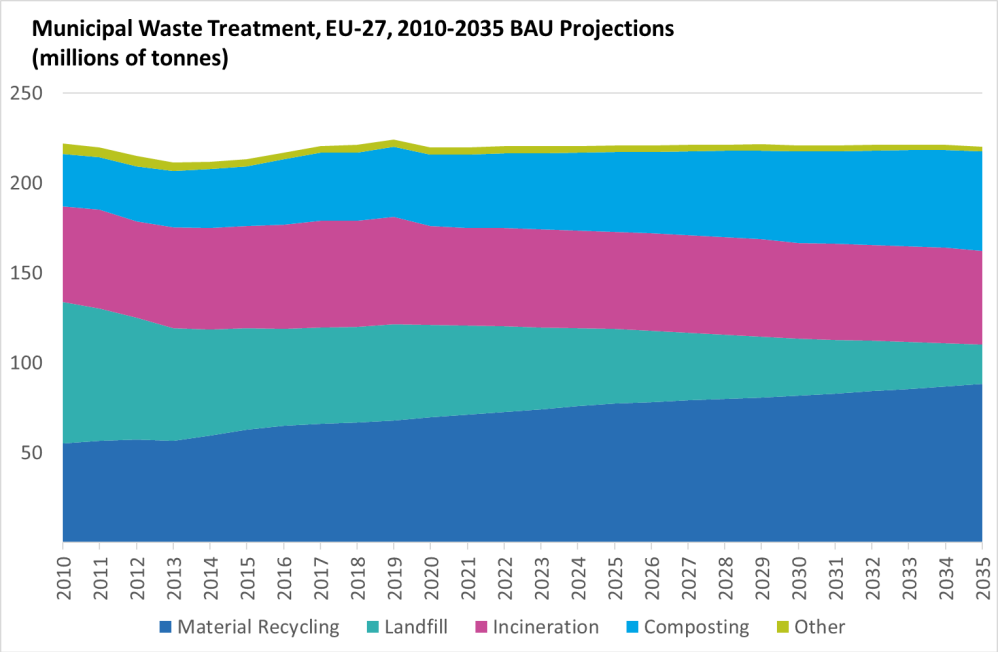


Figure 6. Municipal waste treatment, EU-27. 2010-2019 shows historical data. 2020-2035 shows Business as Usual (BAU) projections based on the assumption that: 1) the kilograms per capita remain constant at the average of the 2010-2019 data, 2) the population grows as per EU projections, and 3) recycling rate and landfill targets in the Waste Framework Directive (2018) are met.

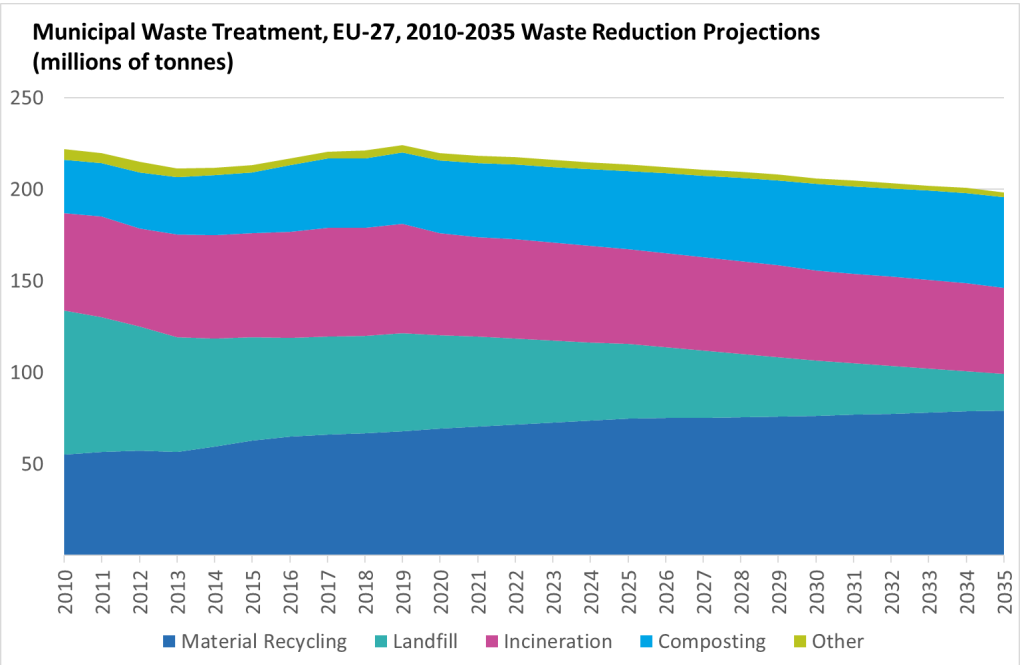


Figure 7. Municipal waste treatment, EU-27. 2010-2019 shows historical data. 2020-2035 shows Waste Reduction projections based on the assumption that: 1) the kilograms per capita reduces by 10% relative to the average of the 2010-2019 data, 2) the population grows as per EU projections, and 3) recycling rate and landfill targets in the Waste Framework Directive (2018) are met.

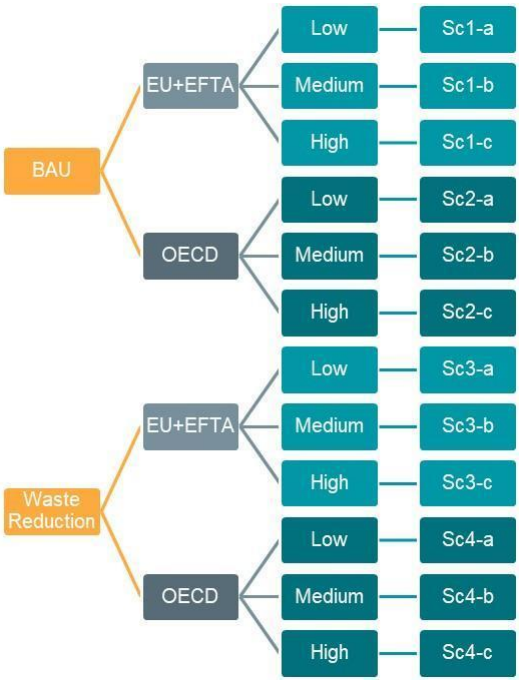


Figure 8. Scenario labeling for results presented below, combining the two waste growth scenarios, two waste export scenarios, and three recycling scenarios for the repatriated waste.

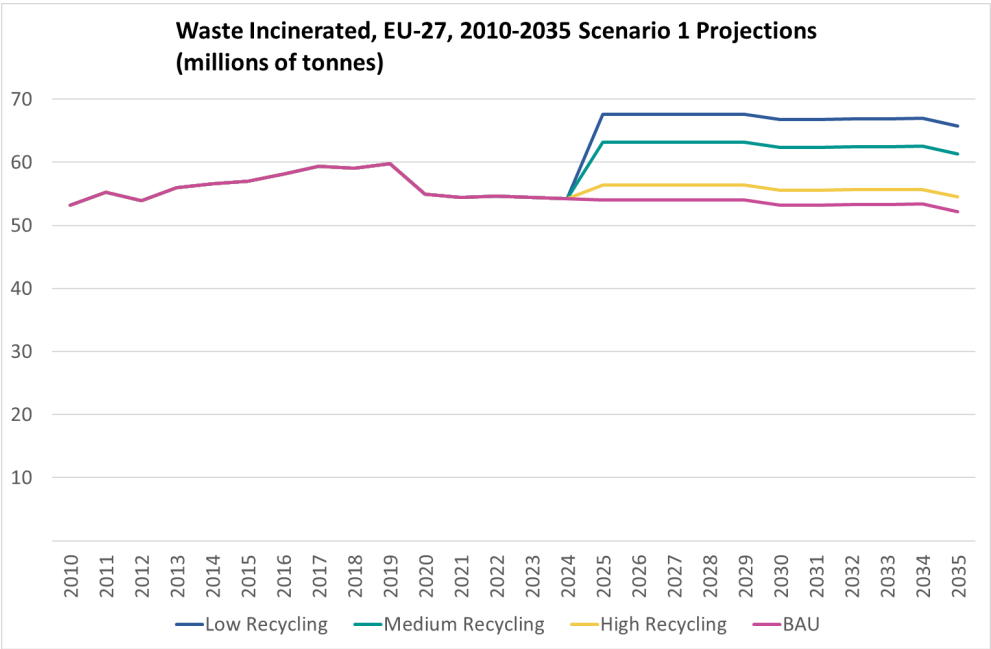


Figure 9. Municipal waste treatment, EU-27, tonnages incinerated from 2010 to 2019, followed by projections from 2020 to 2035. An export ban outside EU+EFTA countries is implemented in 2025. The projections assume BAU waste arisings; all recycling rate and landfill targets in the Waste Framework Directive (2018) are met; and Low, Medium, and High recycling of repatriated waste.

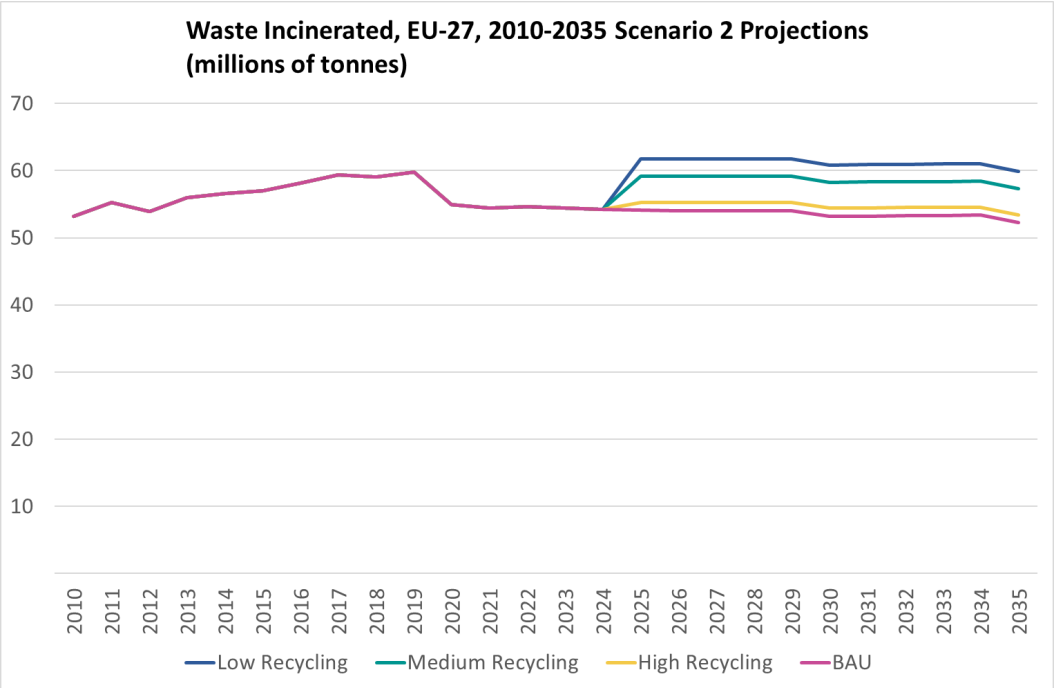


Figure 10. Municipal waste treatment, EU-27, tonnages incinerated from 2010 to 2019, followed by projections from 2020 to 2035. An export ban outside OECD countries is implemented in 2025. The projections assume BAU waste arisings; all recycling rate and landfill targets in the Waste Framework Directive (2018) are met; and Low, Medium, and High recycling of repatriated waste.

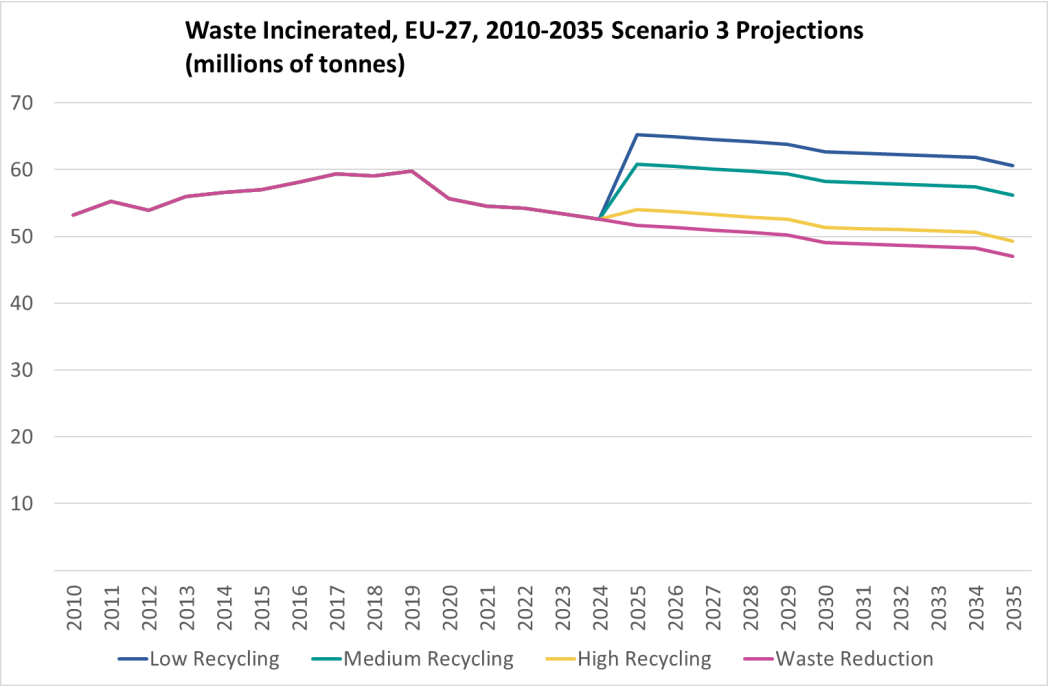


Figure 11. Municipal waste treatment, EU-27, tonnages incinerated from 2010 to 2019, followed by projections from 2020 to 2035. An export ban outside EU+EFTA countries is implemented in 2025. The projections assume a reduction in waste arisings by 10% compared to the 2010-2019 average; all recycling rate and landfill targets in the Waste Framework Directive (2018) are met; and Low, Medium, and High recycling of repatriated waste.

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Zero Waste Europe, 2022

Zero Waste Europe is the European network of communities, local leaders, experts, and change agents working towards the elimination of waste in our society. We advocate for sustainable systems and the redesign of our relationship with resources, to accelerate a just transition towards zero waste for the benefit of people and the planet.

Zero Waste Europe gratefully acknowledges financial assistance from the European Union. The sole responsibility for the content of this event materials lies with Zero Waste Europe. It does not necessarily reflect the opinion of the funder mentioned above. The funder cannot be held responsible for any use that may be made of the information contained therein.