

CIRCULAR INSIGHTS SERIES

COMPARATIVE STUDY OF WASTE RECOVERY TAXES/LEVIES IN EUROPE

EPA RESEARCH REPORT



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Circular Insights

Comparative study of Waste Recovery Taxes/Levies in Europe

EPA Research Report

Prepared for the Environmental Protection Agency
by Mabbett & Associates Ltd

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This report is based on research carried out/data from February to April 2023. More recent data may have become available since the research was completed.

The EPA Research Programme addresses the need for research in Ireland to inform policymakers and other stakeholders on a range of questions in relation to environmental protection. These reports are intended as contributions to the necessary debate on the protection of the environment.

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Foreword

The Circular Insights Series is an initiative of the EPA's Circular Economy Programme, to build evidence and fill knowledge gaps to support circular economy policy. Through analysis of data, literature review, stakeholder interviews, and assessment of best and emerging practices, these studies offer insights relevant to policy makers, business and other circular economy practitioners and contribute to national discussions on circular economy. This study has been carried out by Mabbett & Associates Ltd. under contract to the EPA Research Programme 2021 - 2030.

Executive Summary

The Whole of Government Circular Economy Strategy (WGCEs) aims to transition Ireland away from the traditional 'take, make, consume and dispose' linear economy to a circular one which focuses on keeping resources in use at the highest value for the longest period of time. It necessitates a change in attitude to how waste is seen within the context of the economy and ultimately supports wider sustainability, climate change and resilience goals.

Countries across the globe are seeking policy tools to help stimulate and accelerate a circular economy within their own economies. One of the most successful policy interventions to facilitate this change can be a fiscal measure. Taxes or levies can be used to discourage one form of behaviour or activity and incentivise another more positive one.

The Irish Waste Action Plan for a Circular Economy (WAPCE), published in 2020, proposed a Waste Recovery Levy of €5 per tonne (with potential for escalation) for recovery operations carried out at Municipal Solid Waste (MSW) Landfills, Waste to Energy Plants and Co-incinerators Plants and on exports of MSW.

This is intended to increase recycling, ensure higher value waste management outcomes, and progress Ireland towards a more circular economy. The introduction of the levy will also help Ireland meet the EU's Waste Framework targets for 're-use and recycling of municipal waste to 55% by 2025, 60% by 2030 and 65% to 2035'¹.

This study examines what similar taxes/levies have been applied by other EU Member States and whether there is evidence of these similar fiscal measures supporting the objectives of the proposed Waste Recovery Levy.

Key Findings

The findings from this study highlight a number of factors that are important considerations in the implementation of a Waste Recovery Tax/Levy (WRTL):

Section 2 - Policy Context for a WRTL (page 3) outlines some of the possible factors for policy making regarding the use of a Waste Recovery Tax/Levy.

Section 3 - The experience of WRTLs across Europe (page 9) provides an overview of waste recovery infrastructure and operations across Europe and summaries nine WRTLs used in European countries.

Section 4 - Country Case Studies (page 13) – explores the operation of WRTLs in seven countries in some detail to examine their design, use, and impact.

Section 5 - Conclusion & Recommendations (page 39) - summaries the key findings and associated conclusions from the study and makes recommendations on:

- Providing a holistic Policy Framework
- Ensuring effective incentives and certainty for investment
- The pricing of carbon emissions
- Avoiding unintended consequences

1. Introduction

The Whole of Government Circular Economy Strategy (WGCES)² aims to transition away from the traditional 'take, make, consume and dispose' linear economy to a circular one which focuses on keeping resources in use at the highest value for the longest period of time. It necessitates a change in attitude to how waste is seen within the context of the economy and ultimately supports wider sustainability, climate change and reliance goals.

Countries across the globe are seeking policy tools to help stimulate and accelerate a circular economy within their own economies. One of the most successful policy interventions in the economy can be a fiscal measure i.e., a tax or spend initiative in its broadest sense. Taxes/levies can be used to discourage one form of behaviour of activity and incentivise another.

There has been a Landfill Levy in place in Ireland since 2002, introduced to divert material from landfill and push waste management outcomes higher up the waste hierarchy, with disposal being the least desirable outcome and prevention being the best. This, in combination with other measures, has been hugely successful with the number of landfills in operation dropping from a peak of 31 in 2008 to just 3 commercial landfills in operation in 2022. The levy was introduced at €15 per tonnes of material disposed and now sits at €75 per tonne. This funding is paid into the Environment Fund along with the Plastic Bag Levy and is ring-fenced to support projects and activities that meet the objectives of the Fund.

The Irish Waste Action Plan for a Circular Economy states

'we will introduce a Waste Recovery Levy of €5 per tonne. This will apply to recovery operations at Municipal Solid Waste (MSW) Landfills, Waste to Energy Plants and Co-incinerators Plants and the Export of MSW'.

This is intended to increase recycling rather than recovery and disposal, to ensure higher value waste management outcomes and progress towards a more circular economy. This will help Ireland meet revised EU Waste Framework Directive targets³ for 're-use and recycling of municipal waste to 55% by 2025, 60% by 2030 and 65% to 2035'.

The Circular Economy and Miscellaneous Provisions Act 2022 grants the Minister powers to introduce new environmental levies to affect more responsible behaviour in waste management. It underpins Ireland's shift from a 'take-make-waste' linear model to a more sustainable pattern of production and consumption, that retains the value of resources in the economy for as long as possible.

1.1 Aims and Objectives of this study

This study examines approaches taken by other EU Member States in implementing behaviour change around waste recovery to achieve their EU waste targets. It seeks to identify:

- What other EU Member States implemented a waste recovery levy or similar?
- What wastes are covered by a recovery levy in those Member States operating such a levy and how the distinction between recycling and recovery is made?
- Are there exemptions to the levy in the EU Member States?
- What is the levy amount?
- Is there a tiered approach to the levy and is waste for export subject to this levy if there is a similar levy operating in the receiving EU Member State for example?
- Are these EU Member States comparable to Ireland in the context of geographical and population sizes?
- Can a comparison be made between the different approaches?
- Is there evidence available to show that the introduction of the levy has been successful in delivering the desired behaviour?
- Challenges and successes associated with the identified approaches.

2. The Policy Context for a Waste Recovery Tax/Levy

It is useful to understand some of the possible factors for policy making regarding the use of a Waste Recovery Tax/Levy (WRTL). This section outlines some of those aspects that have been reinforced through undertaking the research for this study and reviewing the readily available literature. It is not intended to be an exhaustive list; however, it does highlight some key aspects that need to be considered in the design or application of such a fiscal measure in the waste management sector.

2.1 The Trend from Landfill Disposal to Energy from Waste (EfW) Treatment

Whilst the majority of countries in Europe have a Landfill Tax⁴, several have no landfill tax and instead rely on landfill bans and restrictions. Landfill Tax and Restrictions/bans are known to be effective at “pushing” material away from landfill and into EfW treatment or recycling systems. However EfW treatment, like landfill, is viewed as being responsible for a loss of valuable materials from a circular economy. To move to a more circular economy there is therefore a need to make EfW less attractive as incinerators need feedstock and they can squeeze out potential recycling opportunities through more attractive gate fees. This challenge is made more difficult when established EfW infrastructure has become oversized for a country or region.

2.2 Disposal Contract Terms

Waste disposal contracts can often be long-term contracts with some public private partnership contracts extending over a period of 25 years. The nature of these contracts means that responses to tax or levies may not have an immediate impact unless there is an appropriate clause within a contract for regulatory changes, for example to enable a change in contracted price, tonnage or composition.

2.3 Waste Treatment Infrastructure and Services

Infrastructure for recycling and waste recovery takes time to plan and construct, and given the impact on surrounding population and environment, there is often resistance to new facilities and changes that impact local populations. This can also apply to waste collection services which may need to be changed or expanded to accommodate new behaviour by businesses and citizens instigated by a fiscal incentive. These issues slow the response to any new fiscal incentives.

2.4 Emissions from EfW

There has long been concern about the air emissions from incinerators and the impact on the environment and human health of various air quality issues; in the UK a parliamentary group has recently investigated this issue⁵. It is, however, the increasing concern about greenhouse gas emissions and subsequent climate change impact that is now influencing the design of some WRTLs. In particular residual waste may contain a considerable amount of plastics and textiles that are fossil fuel based. Food waste and organic fractions may be considered biogenic carbon and of less concern. Where the energy produced from oil based materials in an incinerator is providing heat into a district heating network or electricity into the national grid this can raise the overall carbon intensity of the energy supply; effectively it is more akin to producing energy from oil and gas.

2.5 Producer Responsibility and other “Pull” policy measures

Extended Producer Responsibility (EPR) measures are aimed at making material and products available for recycling and ensuring producers take greater responsibility for them. This may include systems like a

Deposit and Return Scheme (DRS), although these can also be introduced for other reasons, for example the control of litter. Similarly, fiscal measures such as the UK Plastic Packaging Tax introduced in April 2022 are a further policy measure designed to “pull” material out of waste and into recycling streams, as well as encouraging the development of domestic recycling infrastructure. This tax applies to plastic packaging that does not have a 30% recycled content threshold. The result of this tax is a significant increase in the demand for post consumer plastics. In principle there is no reason why such a tax could not be applied to more material types. These measures are some of the most effective at reducing residual waste and across the EU they are increasingly seen as part of the Circular Economy solution.

2.6 The European Emissions Trading Scheme (ETS)

On 22 June 2022, the European Parliament adopted the revision of the EU Emissions Trading System (EU ETS), which will include municipal waste-incineration plants from 2026⁶. While more work to analyse the impact is planned by 31 December 2024 before the introduction (see Amendment 422 below), this has the potential to push high emission fossil fuel derived material such as plastics and textiles out of municipal EfW facilities and potentially encourage the accelerated take up of Carbon Capture Utilisation and Storage (CCUS) technology. How such a scheme will work with each country’s domestic WRTLs in the long term is currently unclear, although some countries have already adopted the ETS approach.

Amendment 422 Proposal for a directive Recital 13 a (new)

(13a) The EU ETS should avoid, as much as possible, undue exemptions and distortive measures. In the long-term, all sectors should play a role in contributing to the achievement of climate neutrality within the Union by 2050 and all CO₂ emissions should be covered by the appropriate Union policy instruments. The inclusion of municipal waste incineration installations in the EU ETS would contribute to the circular economy by encouraging recycling, reuse and repair of products, while also contributing to economy-wide decarbonisation. Since recycling and regeneration activities are already covered by the EU ETS, the inclusion of municipal waste incineration installations would reinforce incentives for sustainable management of waste in line with the waste hierarchy. It would complement other elements of Union waste legislation. Moreover, integrating waste incineration into the EU ETS would create a level playing field between the regions that have included municipal waste incineration under the scope, reducing the risk of tax competition between regions. However, to avoid deviation of waste from municipal waste incineration installations towards landfills in the Union, which create methane emissions, and exports of waste to third countries, with a potentially hazardous impact on the environment, the inclusion of municipal waste incineration installations within the scope of Directive 2003/87/EC from 1 January 2026 should be preceded by an impact assessment to be conducted by 31 December 2024, which, where appropriate, should be accompanied by a legislative proposal to prevent such deviation of waste and such exports

EU countries must measure, report, and verify emissions from municipal waste incineration installations from 2024. By 31 January 2026, the Commission shall present a report with the aim of including such installations in the EU ETS from 2028 with a possible opt-out until 2030 at the latest (as reported in the December 2022 edition of News - European Parliament⁷).

2.7 Waste recovery classification

Landfill and Energy from Waste (EfW) are viewed as the two forms of final disposal with processes such as Mechanical and Biological Treatment (MBT) being viewed as an interim stage. There are a range of other potential recovery operations that are possible, such as using appropriate inert wastes for spreading on land. There do not appear to be WRTLs applied to these operations and so within this study the focus has been on the Energy from Waste recovery route. A full list of recovery operations is shown in **Appendix 3**.

2.8 Energy supplies and renewable energy

At the time of writing this report, due to the widespread sanctions applied to oil, gas and coal supplies originating from Russia and the continuing supply chain impacts of the Covid 19 pandemic, European governments are increasingly concerned about energy security, sourcing sufficient energy and avoiding energy price inflation. This factor is clearly a consideration in the application of any WRTL policy even though EfW facilities may be a relatively small part of the overall energy infrastructure in many countries.

The EU is in the process of revising renewable energy targets and part of this work involves defining what activities are classed as renewable energy. Generally, it has been accepted that mixed waste incineration contains an element of renewable and non-renewable material. The Dutch Waste Management Association highlighted in an article (September 2022⁸) the risks to the waste management industry of biogenic or biomass feedstock material used in waste incinerators being reclassified as non-renewable energy. This could impact negatively on a sustainable energy source, the diversity of energy supply and renewable energy contributions to challenging EU renewable energy targets. According to the Confederation of European Waste to Energy Plants (CEWEP), European waste-to-energy plants now generate enough electricity to meet the needs of 20 million people and heat for 17 million people⁹.

2.9 Waste import and export

Countries with good transport links in Europe can experience significant waste imports or exports due to relatively small price changes caused by a WRTL. This can be tempered by ensuring a WRTL applies equally to exports and imports.

2.10 Waste sorting, cogeneration and CCUS

Three technologies are being seen as measures to address some of the environmental concerns about EfW treatment:

1. Pre-sorting to remove more recyclates, especially plastics prior to incineration. This was recently identified as a key action in an Incineration Review by the Scottish Government¹⁰.
 2. Incineration producing heat as well as electricity is much more efficient than electricity alone and so generating both types of energy will improve plant efficiency.
 3. Carbon Capture, Utilisation and Storage (CCUS) is currently expensive, but it could help extend the life of the EfW and EfW infrastructure in the face of Climate Change concerns. Facilities in the Netherlands are now demonstrating it in practice¹¹.
-

2.11 Residual Waste Recovery in Ireland

Waste recovery infrastructure in Ireland consists primarily of two incinerators and three co-incineration facilities. The table below highlights the incineration co-incineration facilities with their maximum authorised capacity for 2022 and waste accepted in 2020.

Authorised Waste-to-Energy Facilities	Authorised Annual Capacity (April 2022)	2020 Waste Accepted (tonnes)
Thermal Treatment		
Indaver Ireland Ltd. (W0167-03)	220,000 ¹²²	210,235
Dublin Waste to Energy Ltd. (W0232-01)	600,000	599,915
Thermal Treatment (Co-incineration)		
Breedon Cement Ireland Ltd. (Kinnegad) (P0487-07)	105,000	223,500 ¹²³
Irish Cement Ltd. (Platin) (P0030-06)	220,000 ¹²⁴	
Mannok Cement Ltd. (Ballyconnell) (P0378-03)	127,875	
Total	1,272,875	1,033,650

Source: page 69: Volume 1 Current Situation and Challenges, Draft National Waste Management Plan for a Circular Economy
In addition to these facilities, Ireland's three landfill sites have an authorised tonnage for recovery as part of their landfill operations. This amounts to recovery of inert waste or construction and demolition waste for landfill engineering works or daily cover.

Bio-stabilisation of waste fines is also undertaken, with 143,700 tonnes of capacity for this activity being authorised as well as the mechanical production of Solid Recovered Fuel (SRF) and Refuse Derived Fuel (RDF). SRF is used in Irish cement kilns and both SRF and RDF is exported in bales for incineration overseas. Healthcare waste is primarily autoclaved in Ireland.

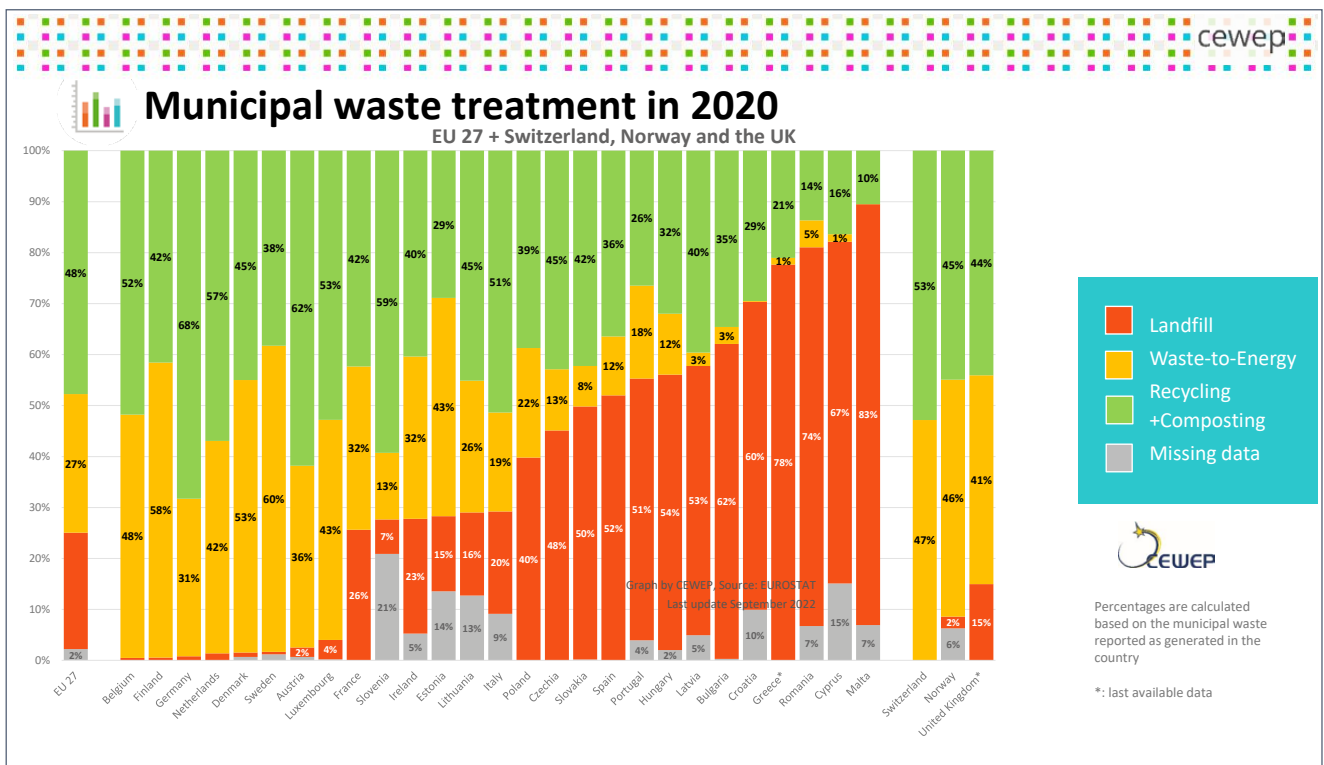
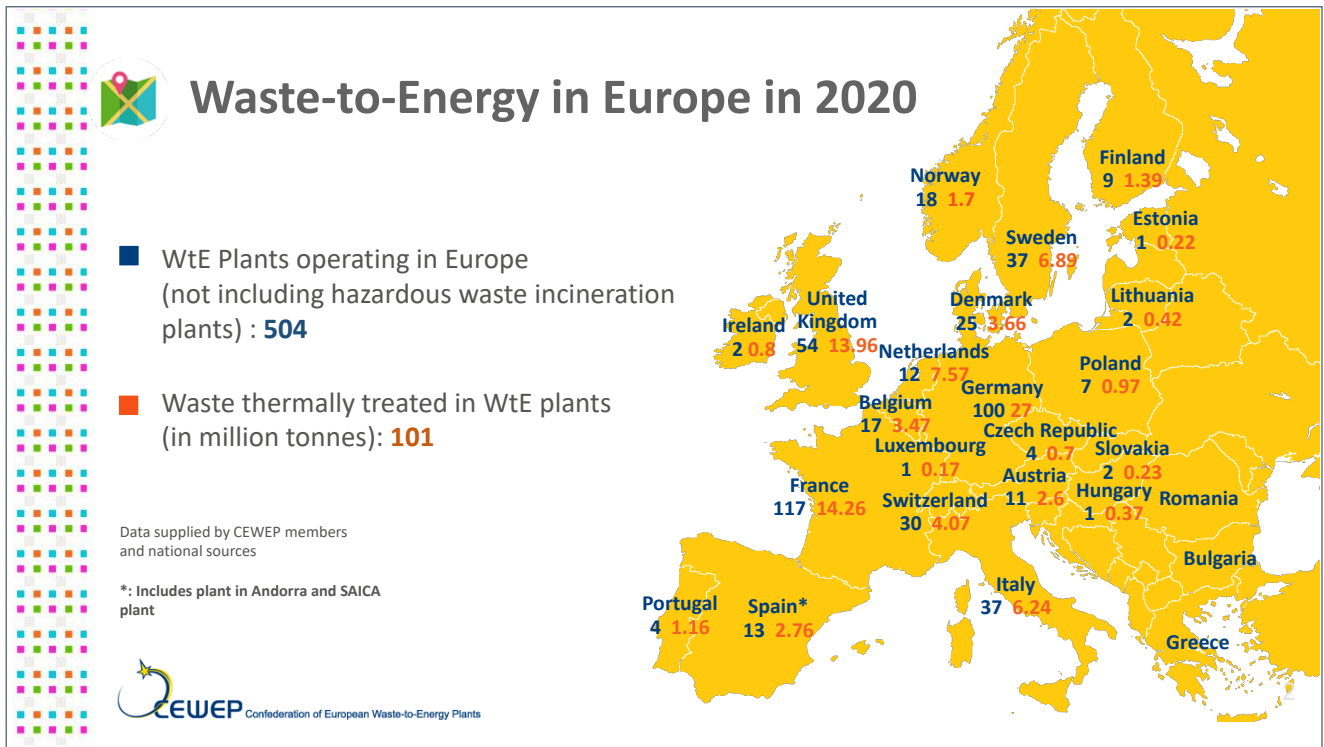
At the time of writing the 2022 figures have not been published but draft figures obtained for 2022¹² show that 1,756,179 tonnes of municipal (commercial and household) residual waste were generated. Approximately 60% of this was incinerated, 23% landfilled and 16% exported for treatment overseas. The exported waste went primarily for EfW treatment in the Netherlands, Sweden and Belgium.

Ireland is undertaking a range of measures to meet EU recycling Targets, for example a Deposit Return Scheme (DRS) for plastic bottles and cans in 2024, and implementing the actions required by the Single Use Plastics Directive. This range of measures may be expected to have an impact on the composition and tonnage of household waste. Despite the waste prevention and EPR measures, with a growing population, there is recognition that more capacity for EfW may be needed to reduce the reliance on waste exports; for example the draft National Waste Management Plan for a Circular Economy supports the provision of an additional 200,000-300,000 tonnes p.a. of EfW treatment infrastructure¹³.

The overall circular economy policy context for Ireland is summarised in **Appendix 2**.

3. The Experience of Introducing WRTLs From Across Europe

Energy from Waste (EfW) is a popular waste recovery and treatment mechanism utilised across Europe. The two diagrams below from the Confederation of European Waste to Energy Plants (CEWEP)¹⁴ show firstly the approximate number of facilities per country according to CEWEP and secondly the proportions of waste recovery in each country for municipal waste.



For this study an online search of EU and European Economic Area (EEA) countries was undertaken to discover what WRTL fiscal measures may be in place. This was then followed up by approaching relevant contacts in each country. Information was challenging to find from online sources regarding this type of tax/levy, due to its general lack of prominence and also the different languages used across Europe, however from a broad literature search it was evident that a range of countries, or autonomous regions, have introduced a Waste Recovery Tax of some kind.

The most prominent of these were nine countries with a short summary of the key features for each shown here:

- **Sweden** - Introduced an Incineration Tax in April 2020 of €7 per tonne and eliminated the tax effective from 1 January 2023.
- **Norway** – Introduced waste incineration tax on 1st January 2022. This is NOK192 (~ € 20) per tonne of fossil-based CO₂ in the waste, levied on all waste that is delivered to a treatment facility.
- **Denmark** – Has since 2010 had a range of taxes applied to waste incineration that is used for energy purposes, including taxes for energy content, and emissions of CO₂, oxides of nitrogen (NO_x) and sulphur.
- **Netherlands** - On 1st January 2020 introduced an import tax of ~ € 32 per tonne for Refuse Derived Fuel (RDF) to be incinerated in the Netherlands; adding to the existing domestic tax arrangements which have been in place since 2014.
- **Belgium (Flanders Region)** - The tax rate depends on the composition and type (e.g., Industrial, Household) of the waste, and the type of facility (with/without energy recovery and with/without clean tech). There are ~16 different rates ranging from c. €62 per tonne for “general incineration” to c. €1 per tonne for specific types of waste soils.
- **France** – has a WRTL regime that has been in place in its current form since 2019 with nine different tax rates being applied. Current rates in 2023 vary from €6 to €23 per tonne based on factors such as the NO_x emissions, the energy efficiency of the facility, pre-sorting, and whether it is compliant with the ISO 50001 Energy Management Standard.
- **Austria** – Has had an incineration tax in place since 2006 at €8 per tonne.
- **Portugal** – has a waste management charge “Taxa de Gestão de Resíduos” (TGR). This covers waste landfilled or incinerated and commenced in 2015 in its current form. The tax levels for incineration and incineration with energy recovery are 70 % and 25 % of the landfill tax rate.
- **Spain (Catalonia Region)** - The Spanish AWCL tax is levied on the delivery of waste for (i) landfill disposal, and (ii) its disposal or energy recovery in waste incineration and co-incineration facilities. It commenced on 1st January 2023 , however in Catalonia it continued an existing tax regime from 2004 where incineration tax is 50% of the landfill rate. In 2023 the tax on incineration was €32.70.

What is evident from this is that there is no one approach across Europe in applying a WRTL, however all are primarily focused upon activities involving the incineration of waste. This means that Mechanical and Biological Treatment (MBT) processes appear to be viewed as an intermediate stage; when disposal is taken to be either incineration treatment or landfill across European States. The WRTLs can either be part of the environmental legislation or part of the finance legislation (e.g., customs/excise duties) in each country.

Some countries have chosen to apply WRTLs on an emissions to air basis, others on a simple weight basis (linked or unlinked to landfill tax rates) and others have many tax rates depending on the type of waste and the type of facility used for treatment. In essence countries appear to have applied a WRTL that fits best with their own waste policy framework and their own economic, geographic and environmental circumstances rather than follow a consistent international model.

Many of the WRTLs identified in this study have been recently introduced or amended and so as may be expected there are limited evaluation studies available on the medium to long term impacts of such fiscal measures. Similarly, it appears that there may be little information on those with a longer standing WRTL, perhaps because it is an adopted part of the fiscal landscape in that country, however it may also be that information on these is simply less accessible.

The recent revisions to WRTLs on this list do reflect a trend away from simple waste- based taxes/levies to more nuanced variable tax rates focused on a combination of their emissions and plant efficiency. This trend is not surprising when you consider the factors a WRTL may now be addressing (i.e., reducing air pollution and climate change impacts, increasing energy efficiency, keeping energy prices low or consistent across fuels, reducing cross border trade in waste, increasing plant efficiency, increasing recycling, reducing annual waste incineration tonnage etc.). Variable tax rates may be necessary for incentivising the right decisions about materials in a move to a more circular economy that also addresses environmental pollution and climate change impacts.

Other countries within the EU, EEA or Europe may be considering introducing a WRTL, for example it was noted from industry press articles that both the UK and Germany have discussed the potential of a WRTL in recent times.

The impact of a WRTL is challenging to measure and attribute to changes in incineration levels in a complex policy environment. There are also a range of economic and infrastructure changes that can also influence the use of landfill versus incineration and increase recycling or reuse. For this reason, in this study reliance has been placed on evaluation studies in individual countries that can directly assess impacts and consider other factors.

Seven countries from the list above, which have notable features of interest, have been explored in more detail in the next section. A summary table for the features of these different WRTLs is shown in **Appendix 1**.

An outline of each country's approach is highlighted in varying levels of detail depending on what information was readily available. There are evaluation reports and studies in some countries and then little information found in others.

4. Country Case Studies

In this section we examine the seven countries of interest that the project team identified as having, or recently had, a WRTL in place. These countries are:

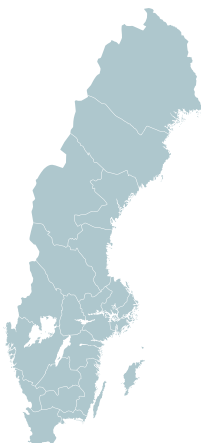
1. Sweden
2. Norway
3. Denmark
4. Netherlands
5. Belgium (Flanders)
6. France
7. Spain & Catalonia

Many of these countries have recently introduced or changed such fiscal measures and so as you would expect there is limited information on evaluation at this point for those cases. Evaluation of impact can be undertaken shortly after a fiscal change, but a realistic expectation is to evaluate after several years of a measure being in place to witness the medium to long term impacts.

There were only a few reports in English available and so many of the reports were translated using *Google Translate*. Where credible evaluation reports are not available industry representatives in each country were contacted to confirm the situation there.

As an introduction to the context of each country, the country population and GDP as well as rural/urban indicator and any notable features of the waste industry are highlighted.

4.1 Sweden



Population:	10.42m
GDP:	635,663 (millions of US\$)
Urban Population (% of total pop.):	88%

4.1.1 Summary of the Swedish Waste Recovery Tax/Levy

Sweden is interesting because an incineration tax was introduced here in April 2020 but was removed from January 2023. Given this experience the Swedish example is explored in some detail in order to understand the various factors involved.

This excise based WRTL was introduced in 2020 in addition to the EU ETS quotas scheme that Swedish EfW plants were already subject to. Biofuel, hazardous waste and animal by-products were exempt from tax liability – which occurs when material is accepted at a facility and goes onto be processed. Co-incineration plants such as for cement, where waste incineration is part of the production of the material, were also exempt. Sweden uses landfill bans/restrictions for some wastes. It has a well developed EfW sector operating in a cold climate and in 2021 it had 38 EfW plants supplying district heating. Around two thirds of food and residual waste in Sweden is collected by private companies and the remainder by local authorities.

After the tax was approved there was considerable interest from the waste industry press in the UK as to the plans and the objective of the tax, which were reported thus:

The Swedish government has approved plans to introduce a 75Kr (£6) per tonne tax on “waste that is burnt”, which will include refuse derived fuel (RDF) imported from the UK.

The tax was passed by the Swedish government on Wednesday, December 04, and will become effective from 1 April 2020.

Under the confirmed plans, the levy will then rise by a further 25 Kr (£2) in both 2021 and 2022 before the annual rise will be indexed after 2022.

Confirming the plans, a spokesperson for the Riksdag (Swedish parliament), said: “The Riksdag said yes to the government’s proposal for a new excise tax on waste that is burnt. The tax is introduced in order for Sweden to be able to achieve the national climate targets and to create a more resource-efficient and non-toxic waste management. The new law takes effect on 1 April, 2020.” They went on to say the tax was needed because by 2045, “Sweden should have no net greenhouse gas emissions to the atmosphere, and emissions from operations in Swedish territory should be at least 85 percent lower than the 1990 emissions”.

(December 2019, Letrecycle.com¹⁵)

The interest from the UK industry at the time was understandable as the UK exported around 750,000 tonnes of RDF to Sweden in 2018, making up around 50% of Sweden's RDF imports. The other major exporter to Sweden is Norway, as well as various countries exporting smaller amounts, including Ireland. Importing waste for incineration increases Sweden's overall greenhouse gas (GHG) emissions.

At the time the tax plans were approved they were criticised by the waste industry in Sweden, including comments that companies operating incineration plants may not be able to pass on the tax costs to customers and so it would have no impact on reducing the amount of waste incinerated nor reduce emissions.

Sweden had previously implemented and withdrawn an incineration tax on household waste between 2006 and 2010. This was based on a measure of the fossil fuel materials within residual waste, similar to the WRTL currently being applied in Norway (see the section on Norway). However, this was withdrawn after an enquiry, as it was assessed to have had no effect on GHG emissions nor on the amount of waste material recycled, however the tax did create incentives to burn household waste in cogeneration plants (electricity and heat generation) instead of district heating plants. When the tax was abolished the EU ETS was adopted.

In June 2016, another inquiry was appointed to review the conditions for waste incineration in Sweden and analyse the need to introduce a tax on waste incineration. The investigation was justified by the fact that the Swedish incineration capacity had been expanding for a long time and had resulted in excess capacity being available which subsequently resulted in an increase in the amount of waste being imported. The investigation concluded that a tax on waste that is incinerated would be purely fiscal in nature and not effective at changing behaviour. However, despite this the government went ahead and implemented an incineration tax and stated that an evaluation of the tax's effects should be done at an early stage after the tax has come into force. (2021, p8, Swedish Tax Agency¹⁶).

Subsequently the Swedish Tax Agency undertook an evaluation of the impact of the "waste incineration tax" against its purpose after only a year of implementation; the purpose being to increase material recycling and reduce greenhouse gas emissions in the long term.-.

The evaluation's (2021, Swedish Tax Agency¹⁷) most relevant findings were:

- The tax has probably been passed on through the EfW plant gate fees in the short term – i.e., passed on to the actors who generated the waste (households and businesses) through collectors of the waste. However, this may only apply domestically as the import market is more competitive. Clauses in the majority of long-term contracts enable the tax to be added as an extra cost.
- In the long term, the tax is estimated to be distributed between the plant gate fee and the waste incinerators' profit in an undetermined ratio; however, should the Swedish plant operators no longer require waste imports (i.e. the overall EfW capacity is sized appropriately for Sweden) then the tax could be fully applied to gate fees.
- The cogeneration and heating plant investment plans for some operators may be adversely affected by the tax due to uncertainty.

- The EU's overall costs for reducing Greenhouse Gases (GHGs) are likely to increase due to the tax. Imported waste is now likely to be sent to other EU countries for incineration or landfilling. The Tax Agency's assessment is that this is because emissions move from a cost-effective management system (EU ETS) to other parts of the economy; where the control of GHG's usually consists of a patchwork of control instruments that may not be cost-effective. There is also the fact that many other EU plants are less efficient than Swedish plants because they produce electricity only, rather than combined heat and power with electricity being more of a by-product (the latter is more efficient).
- EfW powered district heating prices are unlikely to be affected but the overall balance of power generation in district heating may change.
- There was little effect on waste flows - the design of the waste incineration tax, being weight based, provides incentives to sort out heavy fractions such as metals and retain fractions with high energy content, such as plastic. However, there was no evidence this was happening, perhaps as more plastics also mean higher climate emissions under the EU ETS or potentially exceeding many facilities design parameters.

Overall, the evaluation has shown that the tax's effect on increasing recycling has been negligible in the short term and that the tax's effect is probably relatively small even in the longer term. There were indications that the tax would need to be higher (perhaps c. €22 per tonne although this value was based on 10-year-old research in the evaluation) to have an effect in those parts of waste management where a price signal could affect recycling. However, such an increase could also lead to unintended consequences in the form of increased illegal waste practices and also to increased costs/inefficiency for actors who are not sensitive to price (e.g., they cannot act on the price incentives as a result of other control instruments/regulations that interact with the waste incineration tax).

The argument for removing the tax appears to have been influenced by ensuring the production of more electricity at cheaper prices given the situation with sanctions on energy imports (2021, Geminor¹⁸). The tax was removed with effect from 1 January 2023 when it was SEK125/t per tonne or equivalent to about €11.50 and at the same time the energy and carbon taxes on bio-oil were also removed on 13 December 2022 as part of the decisions on Sweden's 2023 budget (2023, euwid-recycling.com¹⁹).

4.1.2 Discussion

The example of Sweden is an interesting one given that a WRTL was introduced and removed in a very short period of time. Two factors that may have influenced the reasons for this were the requirement for production of domestic energy and that Sweden was already applying EU ETS quotas to the industry, meaning there were now two additional charges beyond a facility's gate fee. With reduced residual waste flows following the Covid 19 pandemic and the potential export of waste to EfW plants in nearby countries being a serious consideration.

However ultimately the evaluation by the Tax Agency can be summed up as - it may not be possible to pass on the cost of the tax to those who have control over the generation of the waste to influence change.

The tax was implemented in 2020 with a notional short term escalator mechanism, however it is during 2022 when concerns about energy security and inflation began to become more pressing across Europe and EU ETS quotas had risen significantly in 2021. The evaluation report also states that a clear long-term plan is required for any policy instrument to reduce political uncertainty for investment purposes:

“Uncertainties about future instruments and targets can also affect the cost-effectiveness of the instrument and contribute to cost-effective investments not being carried out. If the policy instrument or the objective is perceived as politically uncertain, it can affect the marginal cost condition and thus cause the policy instrument not to function fully at different times. It is thus not enough to design the control instrument according to the marginal cost condition, but also requires credible political long-term planning”. (2021, p19, Swedish Tax Agency)

The effectiveness of a WRTL in Sweden was dependent upon how the tax could be passed on to either waste producers, energy users or absorbed by the operators. In reality depending upon the constraints upon these different actors the tax could have minimal effect compared to a measure higher up the supply chain. There is also the issue of the basic technicalities of running EfW facilities that need to meet design parameters around daily tonnage and the caloric value of that tonnage.

In terms of where support may be needed to help achieve the goals of the WRTL the report draws attention to the complexity of some recyclable materials such as plastics as opposed to other more simple recyclable materials such as glass. Households and businesses have less knowledge about the recycling of plastics and how to sort them and this may lead to incorrect sorting or the avoidance of sorting leading to higher levels of residual plastic waste ending up in EfW treatment.

The Swedish Tax Agency does also highlight the limitations of their evaluation and that should be noted in this study:

“Evaluating a tax one year after its introduction has involved several challenges, e.g., there have been no statistics available to enable statistical analyzes of the tax’s effects. Several of the questions cannot be evaluated satisfactorily after such a short time because the effects are expected to occur only in the longer term”. (2021, p5, Swedish Tax Agency²⁰)

4.2 Norway



Population:	5.41m
GDP:	482,174 (millions of US\$)
Urban Population (% of total pop.):	83%

4.2.1 Summary of the Norwegian Waste Recovery Tax/Levy

As of 1st January 2022, a mandatory waste incineration tax of NOK192 (~ €16) per tonne of fossil-based CO₂ was levied on all waste that is delivered to waste disposal plants in Norway. This tax is classed as an excise duty²¹ and is calculated by multiplying the tonnage of waste that is delivered to the incineration plant by a pre-determined national factor of 0.5498 per metric ton of fossil CO₂, therefore the cost of the tax per tonne of waste is approximately NOK100.

The Norwegian Environment Agency can, upon application, determine a facility-specific factor that can be used when calculating the fee, instead of the factor of 0.5498. For 2023, two rates (a differentiated tax) have been adopted, one for emissions subject to the EU ETS and one for emissions not subject to the EU ETS. The rate for emissions subject to ETS has been reduced by 50 per cent compared to 2022, while the rate for emissions not subject to ETS quotas has been increased by 141 per cent, to NOK 95 and NOK 476 per tonne of CO₂ respectively. This differentiation requires changes to the Block Exemption Ordinance (GBER) in Norway before it can be implemented.

There are exemptions from the tax for hazardous waste or if the CO₂ produced is captured and stored. These exemptions work in two slightly different ways. Hazardous waste is simply not included in the total amount of "incinerated waste". However, the exemption from tax on CO₂ that is captured and stored is carried out by a reimbursement application for the tax. Refunds are not given for captured and stored CO₂ originating from waste that does not contain fossil material, nor hazardous waste.

Current rates are NOK238 (~€20) (April 2023 Norwegian Tax Administration²²) and an Annual Circular for "the tax on the incineration of waste" is also produced by the government (January 2023, Norwegian Tax Administration²³)

Research for this study did not identify a publicly available review of the tax impact, which may not be unexpected given the short time it has been applied. This WRTL appears to have been introduced in response to the Swedish WRTL applied in 2020. Similar to Sweden, there is a history of political debate on a WRTL. This was highlighted in an article by waste industry press where the RDF Industry Group was calling for the removal of the tax – (January 2022, Recycling Magazine²⁴):

"A similar proposal for a tax of NOK85 was rejected by the Norwegian parliament in March 2021 with the tax slated for re-design, but the tax was revived towards the end of the year with little time for industry to input or prepare for the tax. The Group calls on the Norwegian government to review the findings of the Swedish authorities on its similar tax, and ensure the Norwegian tax is evaluated and removed if the tax does not produce the desired effect."

One issue highlighted with the design of this WRTL is that with fixed proportions of fossil fuel set in the estimated waste composition it may remove incentives to produce lower levels of plastic (and therefore GHG emissions) in Refuse Derived Fuel (RDF).

The future of the tax may be uncertain due to comments from the Norwegian government noted in Recycling Magazine, September 2022.²⁵

“Climate and Environment Minister Espen Barth Eide is also intent on removing the tax his party recently voted forThe premise is that this tax is replaced by another tax, preferably higher up the value chain.”

4.2.2 Discussion

As this is a very recent introduction of a WRTL it is perhaps unsurprising that there is a lack of evaluation information on its impact. However, some of the factors identified as important for success in the Swedish WRTL evaluation example e.g. providing a clear long term plan to reduce uncertainty for investment, are considered likely to be impacted by the apparent “to and fro” of political discussions on the use of this WRTL.

While it may be too early for evidenced data to confirm this, the view from industry representatives contacted in this study is that the removal of the Swedish WRTL will result in significant waste exports from Norway.

4.3 The Netherlands



Population:	17.53m
GDP:	1,012,847 (millions of US\$)
Urban Population (% of total pop.):	93%

4.3.1 Summary of the Netherlands Waste Recovery Tax/Levy

In comparison with Sweden, Norway and Ireland the Netherlands is a much larger economy with a greater population and it is also located in the heart of Northern Europe with excellent transportation links from the port of Rotterdam, and rail lines and roads connecting it to other European countries. It has around a dozen EfW facilities across the country and around 25% of the waste incinerated is imported, mainly from the UK. Due to a range of regulatory measures, there is very limited landfilling of waste in the Netherlands and like Sweden it has an oversized EfW sector reliant on imports.

The Netherlands has had a waste tax that covers waste recovery and EfW treatment for domestically produced waste since April 2014. It applies to waste delivered to facilities to be landfilled or incinerated, or waste that originates in the Netherlands and is transported to a location outside the Netherlands to be incinerated or landfilled there (since 2019). The tax is levied on the weight of the waste, expressed in kilograms and is €35.70 per tonne for waste landfilled or incinerated (January 2023, EU Commission²⁶). It is administered by the Ministry of Finance and exemptions include sewage sludge that is incinerated, asbestos and dredgings.

Plans to extend the WRTL to the import of refuse derived fuel (RDF) for were passed through the Dutch House of Representatives (Tweede Kamer) in 2019 (2019 Letsrecycle.com²⁷). On 1st January 2020 this came into force.

With this change there were several reports produced regarding the overall impact of this change:

- The contribution of incineration of imported waste to Dutch and European CO₂ emissions by TNO in April 2020 (R10567)²⁸.
- Foreign import tax Waste and Emissions of Greenhouse gases by Strategy & PWC in September 2019²⁹.
- Impacts of the Netherlands' Waste Import Tax – Briefing Note by Encomia Consulting in March 2020³⁰. A legal challenge to the introduction of the import tax resulted in a review report (short term) by Eunomia consulting, focusing on the impact on the UK as biggest RDF exporter.

The most relevant findings from these three reports are as follows:

- The TNO report concluded that applying the waste tax as an import levy leads to 937,000 tonnes more CO_{2e} emissions annually at European level. This was due to several factors including methane emissions from increased landfilling in the UK, the increased emissions from metal production for metals lost to landfilling and the increased emissions from importing electricity to replace lost domestic generation.

- The Strategy & PWC report concluded that a tax that reduces waste imports could reduce recycling as EfW operators would have to lower gate fees to attract extra domestic material and could draw material away from recycling options. The EfW operators would also have less finance to invest in safety, maintenance, sorting and efficiency improvements such as CCUS or heat capture. Overall, emissions would rise in the short term as fossil fuels may be required to fill the gap left by imported waste and emissions would rise due to more landfilling in countries like the UK that export RDF to the Netherlands.
- The Eunomia briefing note assessed the impact of the import tax in the short term (2-3 years) against four assumptions and concluded that overall it will be environmentally negative. Considering that there are no restrictions on landfill in the UK and there appeared to be insufficient incineration capacity in other EU countries, like Sweden, to fill the gaps, residual waste not destined to be sent for energy recovery elsewhere may end up being landfilled in the UK. It is therefore unlikely that it will go through such advanced pre-treatment stages associated with RDF production and so less recyclate will be removed before being sent to landfill.

The increased charge added by the tax could lead to import contracts being cancelled as the introduction of a new tax may negate the existing contract within its terms. If waste is disposed of in the country of generation then the EfW facilities in Netherlands would not have sufficient material to operate and so would be forced to lower their gate price. During the Covid-19 pandemic, when EfW facilities were short of material, gate prices were lowered. This made recycling more expensive in comparison and reduced the potential for investment in the EfW sector.

When the scope of the tax expanded in 2020, waste imports to the Netherlands from the UK did decline and tax was indicated as one of the reasons³¹, although 2020 and 2021 have not been normal years due to pandemic-related lockdowns and other measures and so it may take more time before a true picture in historical waste data can be assessed. In addition, a CO₂ levy was also introduced in 2021 to work in tandem with the EU ETS and this applies to incinerator facilities in the Netherlands (OECD 2021³²).

It is clear that the EfW sector in the Netherlands would prefer other mechanisms to be introduced to reduce the amount of incineration capacity. Reports from the Netherlands Parliament on reducing the size of the EfW sector state:

“The waste sector experiences the import levy as restrictive and they would like to see an alternative to it.” “Once agreement has been reached on the phase-out <of incinerators>, we urge the government to reconsider the import levy on foreign residual waste.”
(June 2021, Letsrecycle.com³³)

4.3.2 Discussion

The situation in the Netherlands highlights that a WRTL may have unintended negative environmental impacts if cost pressures incentivises a move to disposal in landfills or indeed to less efficient incineration facilities. The impact on potential investment in lower emission technology and the efficiency of existing plants is also a serious consideration. Again, however, it should be noted that these reports are only assessing performance over the short term.

The relevance to Ireland’s circumstances is less than that of Sweden and Norway mentioned previously because the Netherlands is so well connected to other countries, which makes it easier and less costly to transport waste imports, and it has an oversized EfW sector.

4.4 Denmark



Population:	5.86m
GDP:	398,303 (millions of US\$)
Urban Population (% of total pop.):	88%

4.4.1 Summary of the Danish Waste Recovery Tax/Levy

Denmark introduced taxes on landfilling and incineration in January 1987. In 2019, Denmark produced the highest municipal waste per capita in the OECD³⁴ which appears to be partly due to including significant amounts of garden waste in its waste data, but it has an excellent record at diverting waste from landfill:

“Landfilling decreased from 5% to 1% of municipal waste treated between 2005 and 2017. Incineration with energy recovery accounted for 53% of municipal waste treated in 2017” (OECD, 2019³⁵)

In January 2009 the Danish Government³⁶ undertook a tax neutral restructuring of its waste incineration tax, moving from a weight-based tax to one more focused on efficiency and emissions. The **agreement on restructuring the waste incineration tax** was implemented for a number of reasons.

These reasons and the taxes applied are described in some detail below because it appears to be a unique approach in Europe linked to the Danish district heating infrastructure. Reasons for the restructuring were given as:

1. **Supports the waste hierarchy** – waste with a high energy content such as plastics (and therefore assumed recyclability) is taxed higher than low energy wastes encouraging recycling for this material.
2. **Reduces CO2 emissions in waste incineration plants that are outside the country’s CO2 “quota sector”** - the changes effectively equalise the tax incentives with other industrial process plants that are not in the EU ETS.
3. **Reduces tax incentivised cross-border trade** - addressing materials such as biological sludges being transported outside Denmark and high energy content plastic waste being imported.
4. **More electricity and less heat from waste** - the tax structure will be neutral in its incentive effect between the production of heat and electricity and thus lead to an increase in the co-production of electricity (as previously heat production was incentivised).
5. **Cost-effective incineration** - tax rules will be neutral between different facilities. As a result, waste can be moved between different facilities to be incinerated wherever it is most cost effective.

- 6. **Encourage more waste heat used in businesses** - For ordinary heating customers, waste heat will continue to be relatively cheap heat.
- 7. **Burning of manures will not be at the expense of biogas production** - the tax on burning fertilizer will fall significantly to the same level as for oil, but no subsidy will be given, even if fertilizer is also classed as renewable energy. This will help incentivise biogas production (i.e., Anaerobic Digestion) rather than incineration for this material stream as biogas production is exempt from tax.

As noted on the PWC Denmark website “Combustible waste is today considered a fuel on an equal footing with, for example, oil, coal or gas” (April 2023, PWC Denmark³⁷). This approach leads to a more complex tax structure than in other countries with the tax paid for the incineration of waste effectively split into five different fractions: a waste heat tax; an additional energy charge; a CO₂ tax; and taxes based on NO_x and SO_x emissions. Each of these is described below.

- 1. **The waste heating tax** - is based on the amount of heat produced from waste incineration, including heat used at the plant for indoor heating or water heating.
- 2. **The additional charge** - is based on the energy content of the input waste, per Giga Joule (GJ).
- 3. **The CO₂ tax** - is levied per tonne of CO₂ emissions from waste incineration, except for exempted waste.
- 4. **Taxes on emissions of nitrous oxides and sulphur** - are separate charges imposed on some waste incineration plants depending their fuel mix and technology for cleaning air emissions.

The main three components and rate for 2023 are shown below.

Tax Component	Unit	Fee 2022	CO ₂ tax 2022	Fee 2023	CO ₂ tax 2023
Waste tax at landfill	DKK/tonne	475.00		475.00	
	€/tonne	63.72		63.72	
Waste charge for landfill, hazardous waste	DKK/tonne	475.00		475.00	
	€/tonne	63.72		63.72	
Waste heat tax 1	DKK/GJ	26.00		26.70	
	€/GJ	3.49		3.58	
Surcharge (Additional charge)	DKK/GJ	26.50		26.50	
	€/GJ	3.49		3.49	
CO ₂ tax per tonnes of CO ₂ emitted by burning waste 1	DKK/tonne		179.20		181.70
	€/tonne		24.04		24.38

- 1- Is calculated as waste heat tax with deduction of the additional tax divided by 1.20.
- 2- However, this does not apply to waste that is biodegradable. For companies that do not have permission to emit CO₂, a standard emission factor of 28.34 kg is used. CO₂ per GJ waste.

Source: (PWC Denmark, Appendix 6, 2023³⁸)

In addition, most waste incineration plants take part in the EU Emissions Trading System (ETS) and pay emission allowances for heat and electricity production. Waste incineration plants are therefore subject to two charges related to CO₂ emissions; however, they can claim a reimbursement of the CO₂ tax if the heat is used in certain manufacturing processes (PwC, Denmark 2023³⁹).

Exemptions from the **waste heat tax** element as of April 2023 include (PWC, Denmark, 2023⁴⁰):

- Biomass waste
- Meat meal, bone meal and fat, which originate from the processing of animal waste
- Fibre fractions that emerge after degassing and separation of livestock manure
- Waste without the content of non-biodegradable waste (e.g., plastic, mineral oil products, etc.) in whole independent loads.

The first two taxes ensure that the same energy tax rate is levied on heat whether it is generated from waste incineration or fossil fuels. These taxes on incineration seem mainly designed to ensure a level playing field in the energy sector while also helping divert waste towards recycling. Denmark intends to implement a uniform CO₂ tax from 2025 replacing existing energy taxes across various sectors.

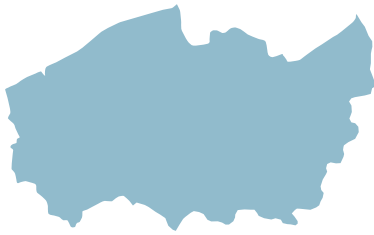
There is no recent analysis on the impact of incineration taxes on recycling rates, however an analysis is expected in 2024 as part of the ongoing green tax reform according to recent comments from the Danish Government (DAKOFA Seminar, April 2023)⁴¹. This will examine the potential for a CO₂-tax on fossil fuel-based CO₂ emissions from waste incineration heat production while no tax will be applied on biogenic CO₂. The analysis will include assessing the (possibly negative) influence this may have on the recycling of waste from biogenic sources (paper, carton, food waste, garden & park waste, cotton textile waste etc). (DAKOFA Seminar, April 2023)⁴².

Denmark also has an industry agreement to reduce the overall capacity of the EfW sector in the country which aims to reduce the sector by 30% by 2030 (Politico, 2020⁴³). There is scepticism about how this can be achieved in a sector that is currently undergoing increased privatisation of infrastructure (from existing municipalities) and increased competitive tendering.

4.4.2 Discussion

Denmark has a range of different fiscal instruments applying to the incineration of waste as these are focused not just on the objectives of increasing recycling levels or reducing emission, but also in creating a level playing field for domestic fuel markets. Given Denmark's considerable district heating system infrastructure this is a tax structure that is focused on that need, making it less relevant for Ireland in a waste management context as the tax is not geared towards having an impact on how waste is treated. However, the principle of taxing specific emissions and equalizing taxes on CO₂ across sectors has relevance to all countries as they aim to meet Climate Change targets.

4.5 Belgium (Flanders Region)



Population:	6,650,000 ⁴⁴
GDP:	322,175 (millions of US\$) ⁴⁵
Urban Population (% of total pop.):	97.5% ⁴⁶

4.5.1 Summary of the Flemish Waste Recovery Tax/Levy

Belgium consists of three regions, Brussels, Flanders and Wallonia. In this section the situation in Flanders is explored. It has a population similar in size to Ireland.

Flanders has had an environmental tax on the incineration and disposal of waste since 1990. Flanders is also well known internationally for its action on waste, the circular economy, and the environment. OVAM (Public Waste Agency of Flanders⁴⁷) is an internally independent agency and is part of the Environment, Nature and Energy policy domain of the Flemish government.

The tax rate in Flanders has around sixteen different rates depending on the composition and type of the waste (e.g. Industrial, Household), and the type of facility used (e.g., with/without energy recovery and with/without clean tech). Once the tax is applied the waste cannot be taxed again.

The tax rates range from €61.82 per tonne for “general incineration” to €0.93 per tonne for “Incineration of waste from soil sanitation operations or of residues from permitted soil sanitation centres”. This compares to a general landfill rate of €123.63 per tonne.

The aim of this tax is to push waste from landfill towards incineration and from incineration towards recycling as much as possible. The tax is also payable on waste exported for processing outside Flanders. While there are many influencing factors involved the most notable result of this policy is that disposal of waste in landfills has been greatly reduced and the landfilling of combustible waste is almost completely phased out by keeping the tax on landfilling significantly higher than that for the incineration of waste (OVAM, 2023.⁴⁸).

On 1st January 2022 the tax on the incineration of industrial/commercial waste was significantly increased (with some exceptions for example for the incineration of hazardous waste). The incineration tax on household waste was kept slightly lower and this may reflect the recognition from OVAM’s own research that Household Waste is less sensitive to incineration tax than commercial and industrial sources.

The tax rate can now be doubled for the incineration of commercial waste that has not been properly sorted with recyclates adequately removed in advance. As the result of this OVAM have already noticed a slight decrease in the amount of commercial waste that has been incinerated after January 2022.

Stricter rules came into effect on 1st January 2023 (OVAM, 2023⁴⁹) which also includes the potential for the tax to be removed on export to another country that has a similar tax. An extract of some of the different rates for 2023 is shown below.

Flanders - Tax on waste dumping and burning	Tax	Waste management - in general	Incineration of waste from soil sanitation operations or of residues from permitted soil sanitation centres... with energy or raw material recuperation -- 24)	€0.93 per tonne.
Flanders - Tax on waste dumping and burning	Tax	Waste management - in general	Incineration of waste from soil sanitation operations or of residues from permitted soil sanitation centres... without energy or raw material recuperation -- 23)	€0.93 per tonne.
Flanders - Tax on waste dumping and burning	Tax	Waste management - in general	Incineration of waste in an incinerator permitted for household waste with energy recuperation and without smoke gas cleaning -- 29)	€11.29 per tonne.
Flanders - Tax on waste dumping and burning	Tax	Waste management - in general	Incineration of waste in an incinerator permitted for household waste with smoke gas cleaning and without energy recuperation -- 28)	€14.38 per tonne.
Flanders - Tax on waste dumping and burning	Tax	Waste management - in general	Incineration of waste in an incinerator permitted for household waste without smoke gas cleaning and without energy recuperation -- 27)	€16.54 per tonne.
Flanders - Tax on waste dumping and burning	Tax	Waste management - in general	Incineration of waste in an incinerator permitted for household waste, with smoke gas cleaning and with energy recuperation -- 30)	€6.80 per tonne.
Flanders - Tax on waste dumping and burning	Tax	Waste management - in general	Incineration of waste in an incinerator permitted for particular waste, with smoke gas cleaning and with energy recuperation -- 34)	€6.80 per tonne.

Source: OVAM website, 2023⁵⁰

A report in 2013 by OVAM, -Research into levies to promote selective collection and recycling of industrial waste⁵¹, looked at what fiscal options were better to pursue. In summary, although it recognised that an option further up the waste supply chain was the best option it also recognised that increasing levies on incineration was perhaps a simpler option due to the administration already being in place for such a measure.

A more recent report in 2021 by OVAM, "Impact of the Increase in the Combustion Tax⁵²", concluded that:

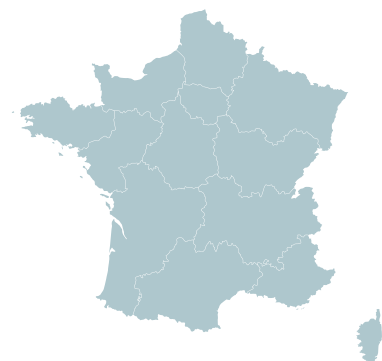
"Based on international research and recent figures relating to the Flemish Region, we conclude from different angles and with different approaches that the increase in this levy alone does not provide a sufficient condition to achieve the future Flemish target, neither for residual industrial waste nor for residual household waste, but a necessary precondition, in combination with other measures, to create a decrease in the supply of residual waste. These other measures include tariff differentiation (between selective fractions and residual waste), the level of comfort and coverage of selective collection and the approach to extended producer responsibility for packaging. Merely increasing the incineration levy would only lead to a relatively limited effect in terms of residual waste production compared to the increase in the levy. This conclusion is in line with international research on this issue."

4.5.2 Discussion

A key finding from OVAM's own research was that a WRTL requires to be part of a holistic package of policy measures and is likely to have a limited effect otherwise. This echoes other findings in this study. The recent increase in rates following on from the evaluation report in 2021 also reflects the previous findings from Sweden covered earlier; where low WRTL rates may be simply absorbed by the sector and waste producers without any change in behaviour.

The other aspects of interest are the strong differentiation of taxes for different wastes and plant design, which Flanders appears to view as important for the tax to work, and the importance attached to adequate sorting of waste for incineration (emphasised by the possibility of an extra tax charge being applied on inadequately sorted waste).

4.6 France



Population:	67.75m
GDP:	2,957,879 (millions of US\$)
Urban Population (% of total pop.):	81%

4.6.1 Summary of the French Waste Recovery Tax/Levy

The main mechanism is the *Taxe Générale sur les Activités Polluantes (TGAP)*⁵³. This began in 1999⁵⁴ and the objective is defined as:

“The waste component of the TGAP aims to limit the development of landfills and incinerators and to encourage virtuous behaviour, i.e., waste prevention and recovery, in line with the hierarchy of waste treatment methods mentioned in Article L. 541-1 of the Environmental Code: prioritise waste prevention in order, preparing for reuse, recycling, any other recovery, in particular energy, waste disposal.”

The TGAP is in fact a range of different taxes and it is collected by the Directorate-General for Customs and Indirect Taxes. The waste component of the TGAP is payable by any operator of a landfill (referred to as a storage facility) or incinerator (referred to as a thermal waste treatment facility) subject to a permit under the Environmental Code. The tax is payable on receipt of waste by the operator of the installation or on export to an equivalent installation.

The TGAP finances the Ecological Transition Agency “Agence de la transition écologique” (ADEME) Circular Economy Fund, which allows it to support operations in line with the objectives of the French waste policy and the Circular Economy Roadmap (50 measures to a 100% Circular Economy).

“The Circular Economy Fund supports the implementation of the waste and circular economy policy in France. The aim is to support local authorities and guide the behaviour of stakeholders through investment in sorting, recycling and recovery facilities as well as prevention actions”.⁵⁵

The escalator mechanism used in France is demonstrated by the rates table below which includes at rate H. the beneficial rate for pre sorting and high energy efficiency in plants.

Designation of thermal treatment facilities for non-hazardous waste concerned	Collection Unit	Quota (in euros)						
		2019	2020	2021	2022	2023	2024	From 2025
A - Authorised installations whose energy management system has been certified in accordance with the international standard ISO 50001 by an accredited body	tonne	12	12	17	18	20	22	25
B - Authorised facilities with NOx emission values of less than 80 mg/ Nm3	tonne	12	12	17	18	20	22	25
C - Authorised installations achieving high energy recovery with an energy efficiency greater than or equal to 0.65	tonne	9	9	14	14	14	14	15
D - Installations belonging to both A and B	tonne	9	9	14	14	17	20	25
E - Installations belonging to both A and C	tonne	6	6	11	12	13	14	15
F - Installations falling under both B and C	tonne	5	5	10	11	12	14	15
G - Installations covered by both A, B and C	tonne	3	3	8	11	12	14	15
H - Authorised installations whose energy efficiency is greater than or equal to 0.70 and achieving energy recovery of high calorific residues that come from high-performance sorting operations	tonne	-	-	4	5,5	6	7	7,5
I - Other authorised installations	tonne	15	15	20	22	23	24	25

Source: [Article 266h - Customs Code - Légifrance \(legifrance.gouv.fr\)](#)

The performance criteria to meet rate H was agreed in 2023 as per an article on better TGAP rates for high performing EfW facilities (ActuEnvironnement.com, 2023⁵⁶). It is hoped that this reduced rate for pre-sorted waste and very efficient facilities will stimulate more recycling, less EfW and more efficient EfW.

A French Government review of the air emissions impact for the TCAP, an evaluation in 2018, concluded amongst other things that the rates were too low to influence industry investment and there should be variable rates and the ability to modulate tax rate at a local level (French Government, 2018⁵⁷). There was also a question in the French Senate on the effectiveness of the TGAP in 2022 (French Senate, 2022⁵⁸).

There are a range of exemptions including asbestos waste related to building materials, non-hazardous waste from natural disasters and healthcare waste with infectious risks or for waste containing persistent organic pollutants until 31 December 2024 (Compta Online, March 2023⁵⁹).

4.6.2 Discussion

France has chosen to use a range of different tax rates, although not as many as Flanders. Again, like Flanders, this differential is aimed at incentivising better plant efficiency, emissions and management but does not go as far as varying the tax rate by waste type. The most Incentivised rate includes all the plant design elements that will maximise beneficial environmental outcomes and includes pre-sorting of waste to be incinerated.

Setting rates for a tax over a 6 year period (as part of an escalator mechanism) clearly will give stakeholders in the sector a degree of certainty to invest around. In addition the use of the tax to help fund the right investment in the sector through the ADME Circular Economy Fund is also a helpful measure to ensure efficiency and innovation.

4.7 Spain (Catalonia)



Population:	7,739,758 ⁶⁰
GDP:	265,583 (millions of US\$) ⁶¹
Urban Population (% of total pop.):	91.3% ⁶²

4.7.1 Summary of the Catalonian Waste Recovery Tax/Levy

In Spain, the Act 7/2022, of April 8, 2022, on Waste and Contaminated Land introduced a new state tax (referred to as the AWCL) on the deposit of waste in landfills, and the incineration and co-incineration of waste. This replaced the taxes already introduced in some autonomous regions in Spain, including Catalonia's. The new tax entered into force on January 1, 2023⁶³.

This new tax is devolved to the autonomous governments in Spain, to which certain legislative, management, collection and auditing powers are granted, and replaces existing autonomous community taxes. The chargeable event for the tax occurs at the point when the waste is landfilled or at the point when it is incinerated or co-incinerated at the facilities concerned.

There are a range of exemptions from the AWCL tax⁶⁴. For example:

- Waste ordered by public authorities in events qualifying as force majeure, extreme necessity or catastrophe, or in cases involving property seized for destruction.
- Waste that comes from taxable transactions on which the tax has effectively been charged.
- Waste that is legally required to be disposed of at these facilities.
- Waste (by government activities) that comes from the decontamination of land which was not able to be treated in situ.
- Inert waste items suitable for restoration, preparation or backfilling work and for building purposes.
- Waste resulting from treatment operations other than rejections of municipal waste, coming from facilities performing recovery operations other than intermediate treatment activities.

However, Catalonia has had a long standing landfill and incineration tax in place prior to this Spanish legislation. This dates back to 2004 with the incineration rate being 50% of the landfill rate. An escalator mechanism is also in place and with the tax being refunded to municipalities on the basis of set criteria, such as how much waste separation activities are undertaken. This is summarised by an extract from the EU's 2021 Polluter Pays Summary of Spain⁶⁵.

Catalonia has continued a similar regime under the new Spanish legal framework. It has a limited range of EfW and incineration plants with around c.20% of municipal waste generated going to Incineration (c.40% is recycled and c.34% is landfilled), although around two-thirds of residual waste goes through Mechanical Biological Treatment prior to landfill or incineration⁶⁶.

The Catalonian Tax returns revenue raised from the tax on landfill and incineration based on a range of good practice measures. The unique approach of the tax is outlined in the European Environment Bureau report extract from "No time to Waste" in October 2020⁶⁷



Catalonia's Landfill and Incineration Tax, with tax refund criteria

In Spain, the region of Catalonia introduced the Landfill and Incineration Tax, with tax refund criteria for municipalities.

Waste management treatment fees need to respect the waste hierarchy in order to make landfill and incineration more expensive than recycling. Collected fees and taxes should finance further improvement in waste management that is in line with the waste hierarchy.

Catalan legislation encourages local authorities to enhance separate collection, and at the same time discourage disposal and incineration of mixed waste by making this more expensive than separate collection.



Catalonia introduced **mandatory separate collection of biowaste for all municipalities** in the region ([Catalonia Law on Waste 9/2008](#)).



This approach of subsidiarity in applying taxes at municipal/regional level was a recommendation of the [European Commission's Early Warning report](#) for Spain. The [Spanish Waste Act](#) enabled Spanish regions to use economic incentives.



Catalonia diverts waste, with a particular focus on biowaste, away from landfilling and incineration through its [Waste Disposal Tax](#) (Law 8/2008). The tax refund criteria for municipalities was introduced to provide a financial incentive for better management of biowaste. The Catalan municipal solid waste disposal tax [is the only tax in the EU](#) that affects municipal solid waste, allowing the return of the revenue to taxpayers, according to their performance.

The Disposal Tax is set per tonne of municipal waste being sent to landfill or for incineration. For municipalities that have not begun the implementation of the separate collection of biowaste, there are higher taxes. **The tax has been essential for boosting biowaste separate collection and recycling.**

There has been a gradual increase in the disposal tax over the last few years to encourage the proper separation of waste at source, minimising disposal and incineration.



Year	Landfilling tax	Incineration tax
2018	€35.60 per tonne	€17.80 per tonne
2019	€41.30 per tonne	€20.60 per tonne
2020	€47.10 per tonne	€23.60 per tonne

Source: [NoTimeToWaste_Annex-IVa_web.pdf \(eeb.org\)](#)

4.7.2 Discussion

Catalonia is an interesting example of a WRTL because of the nature of the return of the tax directly to municipalities based on a specific "rate card" of good practice; unlike France and Flanders where funding from the tax is applied in a more general nature to a Circular Economy Fund. Alongside an escalator mechanism for both landfill and incineration this incentivises further reductions in waste to landfill and incineration.

5. Conclusions and Recommendations

Key Findings

The findings from this study highlight a number of factors that are important considerations in the implementation of WRTL's:

- The Waste Recovery Tax/Levy (WRTL) appears to be a relatively niche area of fiscal policy in the EU27 and European Economic Area. However, as a number of countries have recently introduced, withdrawn, or updated an existing WRTL it is evidently a growing area of interest.
- There appears to be limited information on the evaluation of the impacts of a WRTL although with many languages and different governance structures across the EU there may be additional information which was not readily accessible.
- Across the European Union and the European Economic Community at least eight countries have a WRTL of some form. The WRTLs used by countries identified in this study are focused on Incineration or Energy from Waste (EfW) treatment.
- The WRTLs identified in the eight countries which are subject of this report are different with no consistent approach being adopted.
- Examples of exemptions (or reimbursements) for WRTLs vary by country and include biomass, hazardous waste, and facilities with Carbon Capture Utilisation and Storage (CCUS).
- Mechanical and Biological Treatment (MBT) processes are generally viewed as a pre-treatment stage and so do not have WRTLs applied to them.
- The interest in WRTLs is being driven by a range of factors, including:
 - ▶ the successful use of Landfill Tax/Levies in many countries, which has "pushed" residual waste away from landfill disposal and into Energy from Waste (EfW) treatments, without a significantly large enough diversion into alternative recycling solutions;
 - ▶ oversized EfW sectors in some countries that are hampering the move to higher recycling rates and are reliant on waste imports;
 - ▶ concerns over the emissions, particularly the Greenhouse Gas (GHG) impacts, arising from incinerating oil based materials such as plastics and textiles;
 - ▶ the EU's plan for waste incineration to be included in the EU Emissions Trading Scheme from 2026-2028.
- There are WRTLs based on many different measures, for example: carbon dioxide (CO₂) per tonne of waste; a broader environmental impact per tonne of waste to help equalise EfW with fossil fuel energy costs; the type and efficiency of the plant being used to incinerate the waste; or simply as a percentage of the country's landfill tax.
- The legislative approaches vary by country with some using financial legislation such as Customs/Excise duties and other using Environmental Legislation.
- Each country has a different approach to tax/levy rates; from simply having one rate to up to a maximum of sixteen within the researched countries.
- Some countries have a clear escalator mechanism for tax /levy rates over several years and others do not. Some extend as far as 2025, which may be related to the forthcoming European Union Emissions Trading Scheme (EU ETS) change in 2026 being used as useful time to review.

- Recent experiences in Belgium (Flanders) the Netherlands, and Sweden, have provided analysis of the impact of increased WRTL rates, the application of an import WRTL and the introduction (and then withdrawal) of a WRTL respectively.
- Key points arising from the countries examined include:
 - ▶ The overall impact of a WRTL on reducing EfW treatment and increasing recycling appears to be weak when compared to other interventions further up the supply chain, such as improved waste sorting. This suggests that a WRTL requires to be part of a wider package of holistic circular economy and waste management policy measures to enhance its effectiveness.
 - ▶ If a WRTL rate is set too low, with no clear long-term trajectory of the WRTL as a basis for sector investment, then the impact on improving recycling rates may be negligible. The WRTL costs will generally be absorbed by the waste producers and/or the treatment facility operators and it may reduce overall investment in improved efficiency by the EfW sector.
 - ▶ The use of a WRTL may have unintended negative environmental consequences if it incentivises waste producers to switch to a cheaper landfill disposal alternative; domestically or in other countries (or increase illegal activities).
 - ▶ Where the EfW sector is oversized, applying an import WRTL may reduce imports and force facility operators to lower their prices to attract material, thereby potentially reducing recycling rates through price competition.
 - ▶ An appropriately designed WRTL, with a long term indication of rates providing certainty for investment, is more likely to change behaviour in the waste management sector and of waste producers.
 - ▶ Funding support for the sector associated with introducing any WRTL may be best targeted at innovations and investment focused upon reducing EfW emissions and increasing waste sorting. The increased sorting includes both residual waste prior to incineration and ensuring better understanding and separation of complex materials (such as plastics) for recycling by business and households in order to reduce recyclates in the residual waste stream at source.

Recommendations

The Waste Recovery Taxes/Levies (WRTLs) examined as part of this study appear to have been tailored for each country and are focused on Energy from Waste (EfW) treatment. Ireland has a small EfW sector and so can facilitate strong stakeholder engagement, when designing a WRTL to be introduced as part of the Waste Action Plan for a Circular Economy (WAPCE).

Ireland also appears to have a current under-capacity in the EfW sector because waste material is being exported for incineration and there are plans to increase domestic EfW capacity (with a potential 401,000 tonnes p.a. of infrastructure expansion noted in the National Waste Management Plan for a Circular Economy⁶⁸). Taking these circumstances into account, and based on the key findings, it is recommended that the following points are considered as part of any design and implementation process for a WRTL.

Providing a holistic Policy Framework

- Ensure a close alignment with other policy initiatives such as improved Extended Producer Responsibility (EPR), and the forthcoming Deposit Return Scheme DRS for plastic bottles and cans. There needs to be a balance of interventions at the sorting stage and residual waste receipt stage in the overall waste supply chain; as the former is much more powerful at reducing residual waste impacts than the latter.
- Assess the likely impact of the EU Emission Trading Scheme (ETS) for the Irish EfW sector, choosing a WRTL design that is compatible with, or helps to prepare the sector for, the forthcoming ETS inclusion in 2026-2028. The Irish Government should declare whether a future ETS will be relied upon post 2026 or the WRTL will continue post 2026 alongside the ETS. Care should be taken to avoid costs/inefficiency for actors who are insensitive to price (e.g., they cannot act on the levy incentives as a result of other control instruments/regulations such as ETS).

Ensuring effective incentives and certainty for investment

- A WRTL should consider the importance of factors such as the energy efficiency of the plant and the content of the waste feedstock used in terms of biogenic and fossil fuel material. A reduced rate, such as the ones used in France and Flanders, may be a consideration as an appropriate incentive to achieve greater extraction of recyclates from residual waste and more investment in the energy efficiency of plants.
- If a low levy rate (i.e., €5) is set initially to allow the sector to plan and adapt, provide a clear route map to future rates so investments can be made with some certainty. A route map or escalator mechanism could run to the expected implementation of the EU ETS, or until more information is known about the ETS implementation and application alongside a WRTL in Ireland.
- Any funding provided through the Circular Economy Fund could be directed at innovations in pre-treatment to extract plastics and other fossil fuel derived recyclates, which will help prepare for the impact of the ETS and recover material for recycling that has failed to be collected via recycling systems. Easier and more informed sorting arrangements for plastic recyclates for both households and businesses is another important area of support.

The pricing of carbon emissions

- Where possible, apply the principle of equalizing taxes/levies on any CO₂ emissions across sectors. Even if a carbon dioxide (CO₂) emissions linked levy is not adopted a flat rate levy will still indicate a notional carbon price for residual waste in the Irish economy.

Avoiding unintended consequences

- Ensure that levy rates set will not incentivise landfilling and will minimise any unintended consequences regarding export of waste. Taxing waste export streams and domestic waste streams equally, as is proposed, may prevent some of these unintended consequences.
- With no consensus on appropriate exemptions to a WRTL, any exemptions from the levy should be chosen on what is most appropriate for Ireland's overall strategy and circumstances.
- Set an incineration diversion target for the levy and evaluate progress towards this target within a reasonable time period after implementation, for example within 2- 3 years to ensure that the waste recovery levy is performing as expected without adverse impacts. This target could be similar to the proposed 1% annual reduction target per capita (target 1A) for residual municipal waste going to landfill or incineration; contained in the draft National Waste Management Plan for a Circular Economy (May 2023).

APPENDIX 1 - SUMMARY OF SEVEN WRTLS

Country	Key Dates	WRTL Structure	Legal Basis	Applies to exports/ imports	Notable Tax Exemptions	ETS also applies	Evaluation of impact found*	Comment
Sweden	Introduced 2020 Withdrawn 2023	Incineration tax applied per tonne €11.50 when withdrawn.	Excise Tax	Yes Imports	<ul style="list-style-type: none"> ▶ Biofuels ▶ Hazardous Waste ▶ Animal By products ▶ Co Incineration Plants 	Yes	Yes	<ul style="list-style-type: none"> ▶ a very detailed assessment by the Swedish Tax Authorities highlights the challenges of a WRTL.
Norway	Introduced 2022	Incineration tax applied to fossil fuel content of waste using fixed factor per tonne. €20 in 2023	Excise Tax	Yes Imports	<ul style="list-style-type: none"> ▶ Hazardous Waste ▶ Plants with CCUS 	Partially-different rate for ETS registered facilities.	No	<ul style="list-style-type: none"> ▶ the Norwegian Tax may push waste exports to Sweden ▶ the fixed factor per tonne of waste may hinder some innovations in RDF production.
Denmark	Introduced 2010, to be reviewed in 2024	Up to five tax elements including Heat Energy content, CO ₂ emissions and also NO _x /SO _x charges.	Excise Duties	Yes Imports	<ul style="list-style-type: none"> ▶ Biomass waste ▶ Waste which originate from the processing of animal waste ▶ Fibre fractions that emerge after degassing manure ▶ Non-biodegradable waste, (e.g., plastic, mineral oil products, etc.) in independent loads. 	Varies per facility with discount for those in ETS	No – a review expected in 2024	<ul style="list-style-type: none"> ▶ A unique set of tax elements focused on the large district heating sector in Denmark.

Country	Key Dates	WRTL Structure	Legal Basis	Applies to exports/ imports	Notable Tax Exemptions	ETS also applies	Evaluation of impact found*	Comment
Netherlands	Introduced 2014 Extended to Imports in 2020	Flat rate applied per tonne of waste. €35.70 in 2023	Ministry of Finance	Yes Imports since 2020	<ul style="list-style-type: none"> ▶ Asbestos ▶ Sewage sludge 	Yes, a Netherlands CO ₂ levy was introduced in 2021 to work alongside the EU ETS	Yes	<ul style="list-style-type: none"> ▶ a potential negative environmental impact in other countries identified in the short term due to more landfilling of waste imported.
Belgium (Flanders)	Introduced 1990 and updated	Up to 16 different rates depending on the waste type and efficiency/ clean tech of the treatment facility.	Environment Tax	Yes Imports Yes Exports	<ul style="list-style-type: none"> ▶ Where a similar tax is paid in another jurisdiction 	No	Yes	<ul style="list-style-type: none"> ▶ increased rates and strong differentials may be effective at changing behaviour in the commercial sector.
France	Introduced 1999 and updated in 2019	9 rates based on the efficiency of the treatment facility and pre sorting undertaken	Finance Ministry Customs & Indirect Taxes	Yes Imports Yes Exports	<ul style="list-style-type: none"> ▶ Asbestos building related waste ▶ Infectious healthcare waste ▶ Non-Hazardous waste arising from natural disasters 	No	Partial – focused on air emissions in 2018	<ul style="list-style-type: none"> ▶ Six Year Tax escalator in place till 2025. ▶ Circular Economy Fund financed via the Tax
Spain (Catalonia)	Introduced in 2004 and updated in 2023	50% of landfill rate per tonne	AWCL Environment Legislation	Yes Imports Yes Exports	<ul style="list-style-type: none"> ▶ property seized for destruction ▶ decontamination of land activities by government where material cannot be treated in situ 	No	No	<ul style="list-style-type: none"> ▶ Unique refund mechanism where municipalities get the tax back for increased recycling and composting activities.

APPENDIX 2 - POLICY CONTEXT

At a national level, the Government recognises the importance of the circular economy in achieving its climate ambitions of a 51% reduction in GHG emissions by 2030 and net zero by 2050. Ireland has strengthened its approach to driving a circular economy with recent policy and legislative activity, summarised below.

- *Climate Action Plan 2021*⁶⁹ is the overarching roadmap for achieving Ireland's ambitious climate targets. The Plan includes a dedicated section on the circular economy with 18 actions that aim to support the successful roll-out of a circular economy in Ireland.
- *A Waste Action Plan for a Circular Economy*⁷⁰ is Ireland's roadmap for waste planning and management. Crucially, this Plan moves the focus from traditional waste disposal to look at how we can develop a more circular economy. The digital economy is referenced as a tool to create and recreate value in a circular economy.
- *The Whole of Government Circular Economy Strategy (WGCES)*⁷¹ is Ireland's first national strategy providing a policy framework for the transition to a circular economy, with an aim to eliminate the barriers of the circular economy transition in Ireland and close the gap between policy and action.
- *The Circular Economy Act 2022*⁷² places the Circular Economy Strategy, and Ireland's commitment to a circular economy, on a clear statutory footing and provides the necessary underpinning for relevant measures. The Act defines the Circular Economy for the first time in Irish domestic law. It incentivises the use of reusable and recyclable alternatives to a range of wasteful single-use disposable packaging and other items. It introduces mandatory segregation of commercial waste, bringing it in line with the household market to support increased recycling rates. Integrates the WGCES and Ireland's commitment to the transition to the circular economy into Irish law.

APPENDIX 3 - WASTE RECOVERY SCHEDULE

[1996.] Waste Management Act 1996 [No. 10]

FOURTH SCHEDULE *Section 4 (4).*

Waste Recovery Activities

1. Solvent reclamation or regeneration.
2. Recycling or reclamation of organic substances which are not used as solvents.
3. Recycling or reclamation of metals and metal compounds.
4. Recycling or reclamation of other inorganic materials.
5. Regeneration of acids or bases.
6. Recovery of components used for pollution abatement.
7. Recovery of components from catalysts.
8. Oil re-refining or other re-uses of oil.
9. Use of any waste principally as a fuel or other means to generate energy.
10. Spreading of any waste on land with a consequential benefit for an agricultural activity or ecological system, including composting and other biological transformation processes.
11. Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
12. Exchange of waste for submission to any activity referred to in a preceding paragraph of this Schedule.
13. Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced

GLOSSARY

CCUS	Carbon Capture, Use and Storage
CO₂	Carbon Dioxide
DRS	Deposit and Return Scheme
EEA	European Economic Area
EfW	Energy from Waste
EPR	Extended Producer Responsibility
EU	European Union
EU ETS	European Union Emissions Trading Scheme
GHG	Greenhouse Gas
MBT	Mechanical Biological Treatment
NO_x	Oxides of Nitrogen
RDF	Refuse Derived Fuel
SO_x	Oxides of Sulphur
SRF	Solid Recovered Fuel
WRTL	Waste Recovery Tax or Levy

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Unless stated, country case study sources are as follows:

- ▶ Population: <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=EU> updated as of 2021
- ▶ GDP: <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=EU-CH-NO> updated as of 2021
- ▶ Urban Population (% of total population): <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=EU-NO-CH&view=chart> updated as of 2021

ENDNOTES

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- 2 [gov.ie](http://www.gov.ie) - Whole of Government Circular Economy Strategy 2022 – 2023 'Living More, Using Less' (www.gov.ie)
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- 5 <https://www.pgweb.uk/images/2021/documents/211208-waste-incineration-and-public-health-appg-air-pollution-report-1-compressed.pdf>
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- 13 <https://www.mywaste.ie/wp-content/uploads/2023/05/SRWMO-National-Waste-Management-Plan-for-a-Circular-Economy-Volume-II-Policy-Responses-and-Actions-AW-Onscreen.pdf>
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AN GHNÍOMHAIREACTH UM CHAOMHNÚ COMHSHAOIL

Tá an GCC freagrach as an gcomhshaol a chosaint agus a fheabhsú, mar shócmhainn luachmhar do mhuintir na hÉireann. Táimid tiomanta do dhaoine agus don chomhshaol a chosaint ar thionchar díobhálach na radaíochta agus an truaillithe.

Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

Rialáil: Rialáil agus córais chomhlíonta comhshaoil éifeachtacha a chur i bhfeidhm, chun dea-thorthaí comhshaoil a bhaint amach agus díriú orthu siúd nach mbíonn ag cloí leo.

Eolas: Sonraí, eolas agus measúnú ardchaighdeán, spriocdhírthe agus tráthúil a chur ar fáil i leith an chomhshaoil chun bonn eolais a chur faoin gcinnteoireacht.

Abhcóideacht: Ag obair le daoine eile ar son timpeallachta glaine, táirgiúla agus dea-chosanta agus ar son cleachtas inbhuanaithe i dtaobh an chomhshaoil.

I measc ár gcuid freagrachtaí tá:

Ceadúnú

- Gníomhaíochtaí tionscail, dramhaíola agus stórála peitрил ar scála mór;
- Sceitheadh fuíolluisce uirbigh;
- Úsáid shrianta agus scaoileadh rialaithe Orgánach Géinmhodhnaithe;
- Foinsí radaíochta ianúcháin;
- Astaíochtaí gás ceaptha teasa ó thionscal agus ón eitlíocht trí Scéim an AE um Thrádáil Astaíochtaí.

Forfheidhmiú Náisiúnta i leith Cúrsaí Comhshaoil

- Iniúchadh agus cigireacht ar shaoráidí a bhfuil ceadúnas acu ón GCC;
- Cur i bhfeidhm an dea-chleachtais a stiúradh i ngníomhaíochtaí agus i saoráidí rialáilte;
- Maoirseacht a dhéanamh ar fhreagrachtaí an údaráis áitiúil as cosaint an chomhshaoil;
- Caighdeán an uisce óil phoiblí a rialáil agus údaruithe um sceitheadh fuíolluisce uirbigh a fhorfheidhmiú
- Caighdeán an uisce óil phoiblí agus phríobháidigh a mheasúnú agus tuairisciú air;
- Comhordú a dhéanamh ar líonra d'eagraíochtaí seirbhíse poiblí chun tacú le gníomhú i gcoinne coireachta comhshaoil;
- An dlí a chur orthu siúd a bhriseann dlí an chomhshaoil agus a dhéanann dochar don chomhshaol.

Bainistíocht Dramhaíola agus Ceimiceáin sa Chomhshaol

- Rialacháin dramhaíola a chur i bhfeidhm agus a fhorfheidhmiú lena n-áirítear saincheistanna forfheidhmithe náisiúnta;
- Staitisticí dramhaíola náisiúnta a ullmhú

agus a fhoilsiú chomh maith leis an bPlean Náisiúnta um Bainistíocht Dramhaíola Guaisí;

- An Clár Náisiúnta um Chosc Dramhaíola a fhorbairt agus a chur i bhfeidhm;
- Reachtaíocht ar rialú ceimiceán sa timpeallacht a chur i bhfeidhm agus tuairisciú ar an reachtaíocht sin.

Bainistíocht Uisce

- Plé le struchtúir náisiúnta agus réigiúnacha rialachais agus oibriúcháin chun an Chreat-treoir Uisce a chur i bhfeidhm;
- Monatóireacht, measúnú agus tuairisciú a dhéanamh ar chaighdeán aibhneacha, lochanna, uiscí idirchreasa agus cósta, uiscí snámha agus screamhuisce chomh maith le tomhas ar leibhéil uisce agus sreabhadh abhann.

Eolaíocht Aeráide & Athrú Aeráide

- Fardaíl agus réamh-mheastacháin a fhoilsiú um astaíochtaí gás ceaptha teasa na hÉireann;
- Rúnaíocht a chur ar fáil don Chomhairle Chomhairleach ar Athrú Aeráide agus tacaíocht a thabhairt don Idirphlé Náisiúnta ar Ghníomhú ar son na hAeráide;
- Tacú le gníomhaíochtaí forbartha Náisiúnta, AE agus NA um Eolaíocht agus Beartas Aeráide.

Monatóireacht & Measúnú ar an gComhshaol

- Córais náisiúnta um monatóireacht an chomhshaoil a cheapadh agus a chur i bhfeidhm: teicneolaíocht, bainistíocht sonraí, anailís agus réamhaisnéisiú;
- Tuairiscí ar Staid Thimpeallacht na hÉireann agus ar Tháscairí a chur ar fáil;
- Monatóireacht a dhéanamh ar chaighdeán an aeir agus Treoir an AE i leith Aeir Ghlain don Eoraip a chur i bhfeidhm chomh maith leis an gCoinbhinsiún ar Aerthruailliú Fadraoin Trasteorann, agus an Treoir i leith na Teorann Náisiúnta Astaíochtaí;
- Maoirseacht a dhéanamh ar chur i bhfeidhm na Treorach i leith Torainn Timpeallachta;
- Measúnú a dhéanamh ar thionchar pleannanna agus clár beartaithe ar chomhshaol na hÉireann.
- Taighde agus Forbairt Comhshaoil
- Comhordú a dhéanamh ar ghníomhaíochtaí taighde comhshaoil agus iad a mhaoiniú chun brú a aithint, bonn eolais a chur faoin mbeartas agus réitigh a chur ar fáil;
- Comhoibriú le gníomhaíocht náisiúnta agus AE um thaighde comhshaoil.

Cosaint Raideolaíoch

- Monatóireacht a dhéanamh ar leibhéil radaíochta agus nochtadh an phobail do radaíocht ianúcháin agus do réimsí leictreamaighnéadacha a mheas;
- Cabhrú le pleannanna náisiúnta a fhorbairt

le haghaidh éigeandálaí ag eascairt as taismfí núicléacha;

- Monatóireacht a dhéanamh ar fhorbairtí thar lear a bhaineann le saoráidí núicléacha agus leis an tsábháilteacht raideolaíochta;
- Sainseirbhísí um chosaint ar an radaíocht a sholáthar, nó maoirsiú a dhéanamh ar sholáthar na seirbhísí sin.

Treoir, Ardú Feasachta agus Faisnéis Inrochtana

- Tuairisciú, comhairle agus treoir neamhspleách, fianaise-bhunaithe a chur ar fáil don Rialtas, don tionscal agus don phobal ar ábhair maidir le cosaint comhshaoil agus raideolaíoch;
- An nasc idir sláinte agus folláine, an geilleagar agus timpeallacht ghlan a chur chun cinn;
- Feasacht comhshaoil a chur chun cinn lena n-áirítear tacú le hiompraíocht um éifeachtúlacht acmhainní agus aistriú aeráide;
- Tástáil radóin a chur chun cinn i dtithe agus in ionaid oibre agus feabhsúchán a mholadh áit is gá.

Comhpháirtíocht agus Líonrú

- Oibriú le gníomhaireachtaí idirnáisiúnta agus náisiúnta, údaráis réigiúnacha agus áitiúla, eagraíochtaí neamhrialtais, comhlachtaí ionadaíochta agus ranna rialtais chun cosaint comhshaoil agus raideolaíoch a chur ar fáil, chomh maith le taighde, comhordú agus cinnteoireacht bunaithe ar an eolaíocht.

Bainistíocht agus struchtúr na Gníomhaireachta um Chaomhnú Comhshaoil

Tá an GCC á bhainistiú ag Bord lánaimseartha, ar a bhfuil Ard-Stiúrthóir agus cúigear Stiúrthóir. Déantar an obair ar fud cúig cinn d'Oifigí:

- An Oifig um Inbhuanaitheacht i leith Cúrsaí Comhshaoil
- An Oifig Forfheidhmithe i leith Cúrsaí Comhshaoil
- An Oifig um Fhianaise agus Measúnú
- An Oifig um Chosaint ar Radaíocht agus Monatóireacht Comhshaoil
- An Oifig Cumarsáide agus Seirbhísí Corparáideacha

Tugann coistí comhairleacha cabhair don Gníomhaireacht agus tagann siad le chéile go rialta le plé a dhéanamh ar ábhair inní agus le comhairle a chur ar an mBord.



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