

# Deliverable D.A.10

*Recommendations of other economic instruments, technological suggestions and regulatory/market-based opportunities to support plastic circular economy in Israel*

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# 1. Introduction

The plastic sector in Israel is segmented according to the following pie chart:

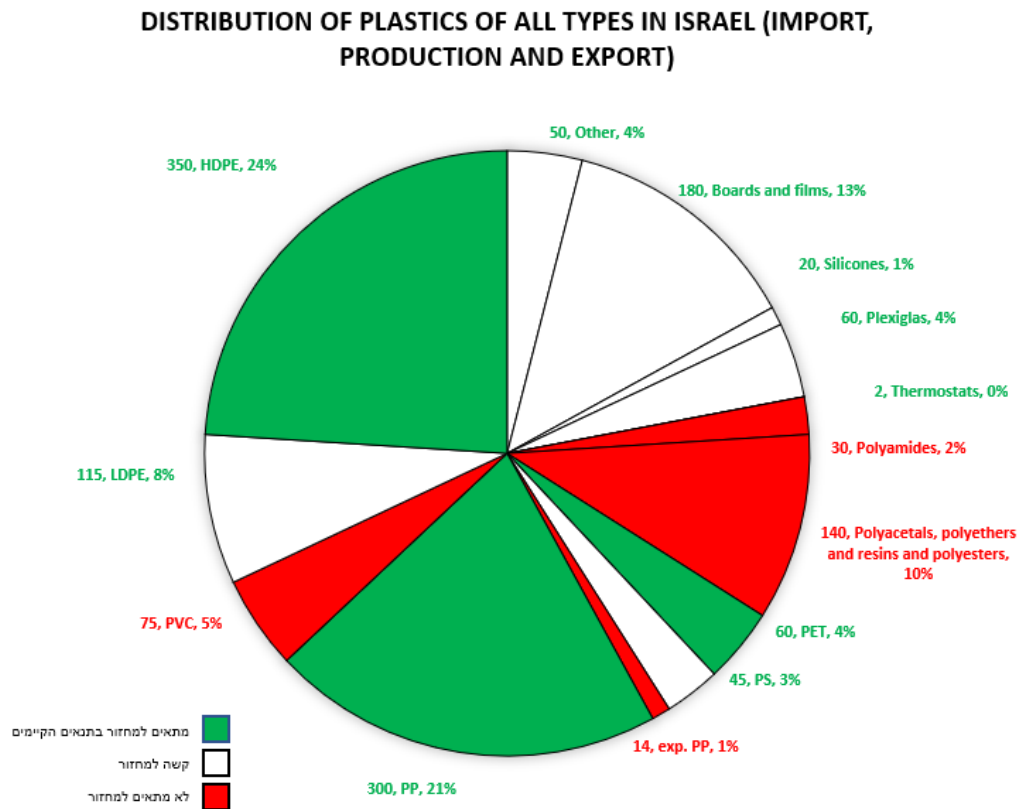


Figure 1. Segmentation of the plastic sector in Israel

(Source: the national plan for CE in industry - packaging sector. A whitepaper for the workgroups 17.4.2019<sup>[1]</sup>)

The main barriers for plastic recycling and the use of recycled plastic were identified in D.B.6 and attached here as Annex 1. On other hand, in comparison to the situation in Europe, Israel has significant market limitations, which prevent the ability to maintain a sophisticated market of plastic waste treatment:

- Waste treatment policy in Europe began long before it began in Israel, and the infrastructure has long been established (collaboration with local authorities, sorting, separation, and recycling facilities).
- The EU creates long term certainty for the various players, enabling investments and development of infrastructure.

Unlike the situation in Europe, local policy in Israel is unstable. Not all waste streams have sufficient regulation (agricultural waste treatment, proper definition of "recycling" etc.) and

[1] התוכנית הלאומית לכלכלה מעגלית בתעשייה - סקטור אריזות מסמך לדיון 17- באפריל 2019 ,

there are difficulties in setting up sorting recycling facilities and recycling facilities (both regulatory and financial). It is the position of the industrialist association that measures such as surcharges on raw materials, without providing solutions to the aspects raised above, is only a revenue generating tax for all intents and purposes, and not an incentive to recycle, especially taking into account that the business sector would find it extremely difficult to promote adequate alternatives in the short and medium term.

We should mention that the purpose of this document is to provide proposals to eliminate such barriers. Given an implementation of the variety of recommendations, it will also be possible to consider taxation as one of the measures.

When developing recommendations, it is important to maintain a systemic view. We recommend the conceptual framework proposed by the Dutch research organization TNO, as outlined in the figure below

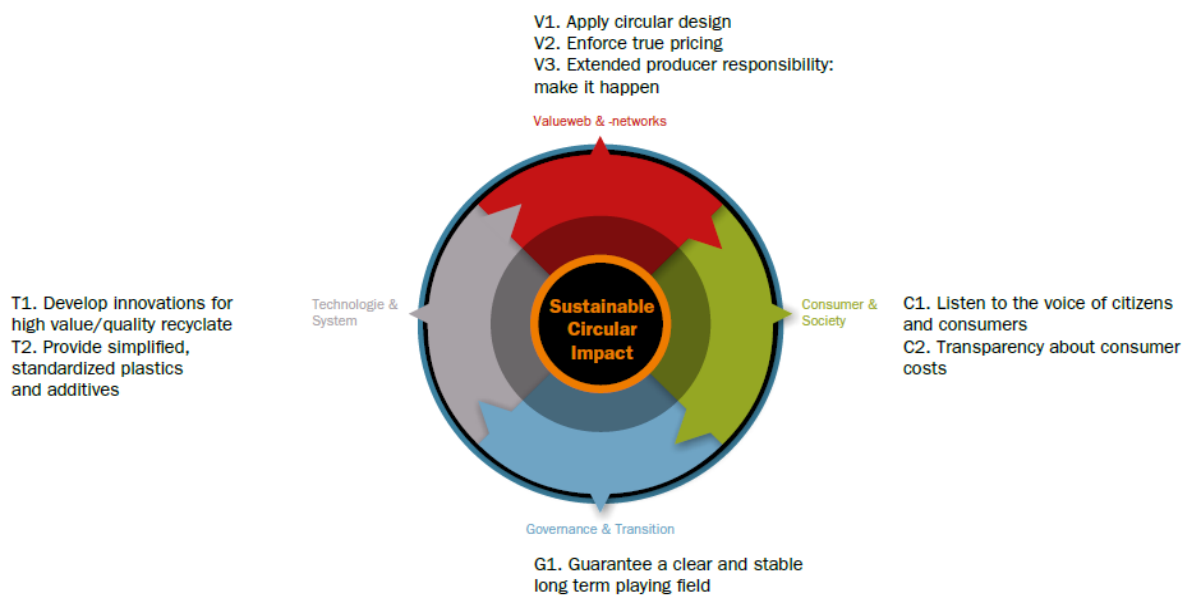


Figure 2. Sustainable Circular Impact

## 2. Economic instruments, taxes, and subsidies

### 2.1 Introduction

Currently, waste quantities in Israel are increasing rapidly, even faster than the rate of population growth (MoEP, 2020). Recently, the Ministry of Environment Protection has set goals for waste reduction and recycling over the next decade. Plastic waste represents up to 45% of the total waste in Israel by volume (Gal Recycling, 2021). In order to achieve the goals of reducing plastic waste in Israel, it is crucial to understand the current and desired incentive structures facing each of the relevant actors along the value chain of products containing plastic. This chapter outlines incentives designed to increase plastic recycling and use of recycled plastic in Israel, and through which reduce the environmental impact incurred due to both the production of plastic, and more significantly, the disposal of plastic into the natural environment.

The term incentives in this chapter are meant to be any set of instruments or policies that would encourage an actor to choose one option or mode of behavior over another. This includes both economic and non-economic incentives, either of which could be positive or negative (i.e., carrots or sticks). Furthermore, economic incentives could be direct (e.g., subsidies, taxes, tax-breaks) or indirect (e.g., criteria for concession contracts). Policies that do not allow for choice, for instance, product bans, may also be effective in reducing plastic waste, but do not fall under the definition of incentives, and therefore are not addressed in this report. Other actions that may influence behavior, such as awareness raising, may also play a critical role in overall policy, and can be incentivized as well.

Incentives may have one or more objectives, for instance:

- Changing producer behavior
- Changing product design
- Changing consumer behavior
- Stimulating innovation / Financing research and development
- Financing other operations and technologies
- Changing consumer behavior
- Revenue generation

Ideally, incentives should be closely targeted to their specific objective. Figure 3 presents an overview of different policy instruments for reducing plastic waste.

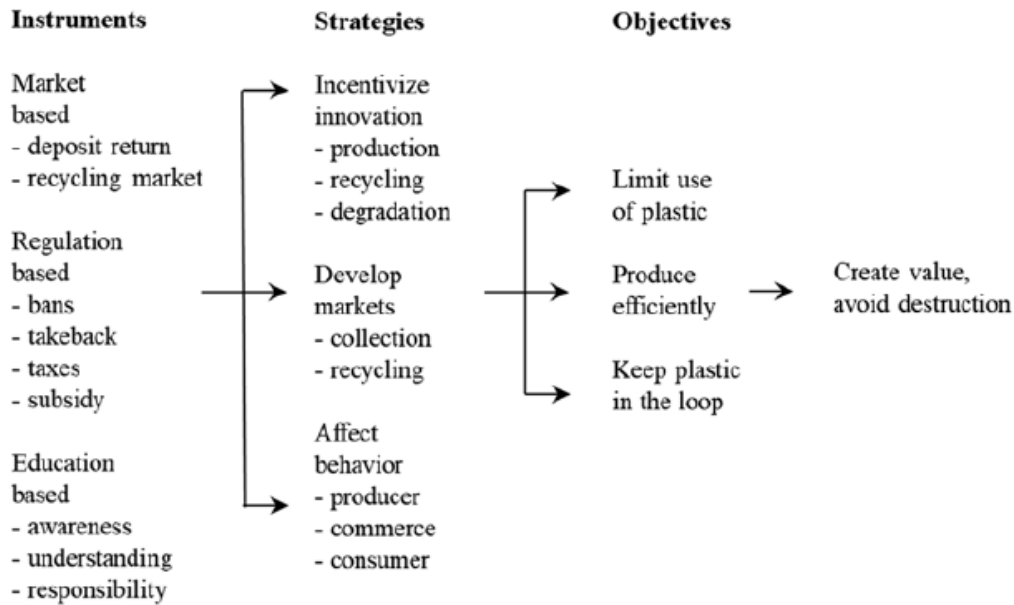


Figure 3. Instruments, Strategies, and Objectives of a Circular Plastic Policy.

(Source: Walker et al., 2020)

The value chain for plastic begins with product conceptualization and design and ends with either material recycling or disposal. A simplified depiction of the value chain is given in Figure 4 below.<sup>[2]</sup> As can be seen in the figure, the value chain can be divided into pre-consumption “front-end” stages - those occurring from product conceptualization through product consumption - and post-consumption “back-end” stages - those occurring from the discarding of the product by the consumer through recycling or ultimate disposal of the product back into the environment at the end of life. Focus on individual stages in the product life-cycle is useful because it allows the targeting of specific incentives to overcome known bottlenecks in the circular part of the life-cycle process. However, while specific incentives typically target a particular stage, in order to achieve a circular economy with minimal waste disposed into the environment, it is critical to adopt a holistic perspective in designing incentives that integrate between all stages, pre- and post-consumer. Failure to do so will result in incompatibilities and ultimately the incentives are likely to be of limited effectiveness.

[2] The figure is meant to be schematic, and in actuality additional stages may exist, for instance, initial sorting by the consumer before discard



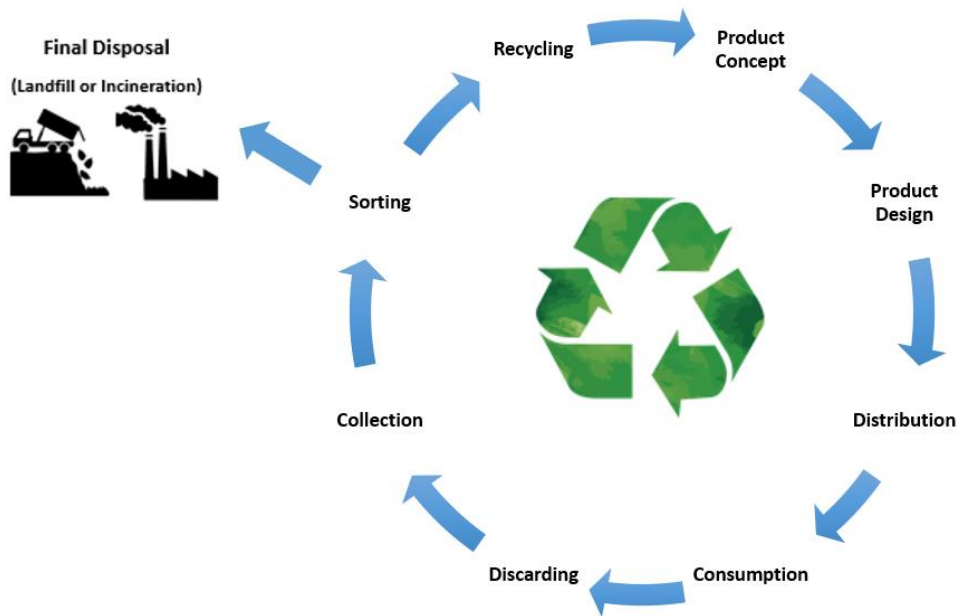


Figure 4. Simplified Value Chain of Products in the Economy

It should be noted that in terms of the ultimate destination of plastic and other waste while there is broad consensus regarding the objective of reducing the disposal of plastic waste into landfills and the environment, there is a heated debate in Israel and abroad regarding the relative merits, including environmental impacts and economic and technical feasibility, of incineration versus recycling. This chapter focuses on incentives for the reduction and recycling of plastic waste and does not address the issue of how recycling compares to incineration as a potential waste management solution.

Known obstacles along the value chain, regardless of country, include the price gaps between virgin and recycled materials, high price volatility, uncertain quality of recycled materials, contamination of plastics rendering them non-recyclable, mixed materials that are difficult to separate into recyclable components, lack of demand for recycled materials and high levels of uncertainty regarding the feasibility of technologies and projects.

Current plastic recycling rates, even in the most advanced economies, are in many cases well below target levels set by governments. In the European Union as a whole, just between 31-33% of plastic waste collected in 2018 was registered as recycled, and much of this volume was exported to low-income countries where its ultimate fate is unknown, though it is known that a significant amount is not recycled (Plastics Europe, 2019; João et al., 2020). As of 2018, only three EU countries had recycling rates higher than 50%.

Even in advanced systems, recycling rates for some types of plastics may be high, while for others extremely low. In France, for instance, 61% of plastic bottles were recycled in 2019, but just 5% of other plastic packaging (Suez 2021a). Furthermore, most of the recycling that does actually occur is in fact, down-cycling, which produces plastic of inferior quality and, thus, only delays the eventual disposal of the product (Calleja, 2019). Furthermore, pre-consumer stages such as distribution, as well, as post-consumer stages, including the recycling itself, can be energy intensive and have significant environmental impacts. Therefore, this chapter assumes that:

- In order to achieve a truly circular economy with regards to plastics, incentives should, to the extent possible, be designed to reduce the production and consumption of plastic.



- Of the plastics that are produced and consumed in Israel, the focus of the incentives should be on promoting a system that is both capable of recycling various forms of plastic waste into high quality reusable plastic raw materials and ensuring that market conditions are favorable to the use of such products relative to virgin plastic.

Incentives should be designed to be as direct and focused as possible on the specific actor or set of actors for which they are designed and should attempt to anticipate all potential outcomes. Poorly designed incentives, even well-meaning ones, can be ineffective or even damaging, by, for instance, resulting in illicit disposal, the substitution of products that are even worse for the environment (Truecost, 2016) or shifting incentives for disposal to other locations and undermining local capacity.<sup>[3]</sup>

This chapter continues as follows. Section 2.2 provides an overview of various plastic reduction and recycling programs around the world, with a particular focus on the European Union (and the UK). Section 2.3 reviews the existing incentives for plastic reduction and recycling in Israel and offers recommendations for the potential implementation of additional incentives.

## 2.2 Plastic incentives in Europe

Different countries around the world have developed a variety of incentive plans to discourage plastic waste and encourage plastic recycling. Foremost among these are the countries of the European Union (EU). In addition to its negative environmental impact, plastic waste also represents unutilized raw materials. According to estimates, Europe loses up to 105 billion euros per year on plastic packaging (European Commission, 2019).

In 2018 the EU issued directives designed to serve as the basis of a strategy for plastics in a circular economy (EU, 2018a, 2018b, 2018c). By 2030, all packaging material on the EU market will have to be recyclable (European Commission, 2019). The plan outlines a number of instruments and incentives for recycling plastic waste and reducing the consumption of disposable packaging. Among the core elements of the strategy are the development of uniform labels for biodegradable plastic substitutes, the creation of collection points for plastic waste extracted from the sea in all European ports, limits on the use of microplastics, especially in cosmetics, and a series of economic incentives for the recycling industry. Estimates predict that if the scale of plastic recycling increases fourfold by 2030, this would create 200 thousand jobs (EIT, 2020).

Though the EU has overall objectives and employs some specific policy instruments, most of the policy governing plastic waste is undertaken at the level of the member states, or even at the sub-national district level. In many cases, incentives are included directly in laws, while in others, the government's primary responsibility is to set objectives and monitor progress in achieving them, while the responsibility for achieving the objectives, including establishing various incentive structures, is left to the producers and/or consumers of plastic. In many of

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[3] For instance, the United Kingdom (UK) has a policy designed to provide certification that packaging materials have been recycled into new products. Recyclers are awarded a Packaging Recovery Note (PRN) indicating the quantity of waste recycled, which can be sold to producers to allow them to fulfill recycling mandates or goals. However, while exporters of waste receive accreditation for the entire weight of the waste they export, local recyclers receive accreditation only for the weight of the content actually recycled, which is often less than half of the waste disposed of. The effect of this policy is to encourage the export of waste, much of which is not recyclable, and to disadvantage local recycling initiatives within the UK (Eunomia, 2015). Due to its perverse incentives and its limited effectiveness, this policy is currently being revised.

the latter cases, the incentives, including the application of fees, setting and monitoring of standards, launching of trading systems, and even support for individual projects, is undertaken by cooperatives made up of private and/or public sector entities, such as those established under Extended Producer Responsibility (EPR) systems. Major instruments in use in the EU strategy as well as in individual EU countries are presented below.

### 2.2.1 Fees, surcharges & taxes<sup>[4]</sup>

The EU and many of its member countries have advocated for policies that would achieve **full cost recovery of the overall economic costs (including externalities (costs of pollution born by the environment and/or the public at large))**. Because the costs of externalities are often difficult to determine with precision, various fees, surcharges and taxes generally consist of an amount covering actual operating costs, often with an additional amount that is often not based on any hard research but is meant to serve as a price signal to users.

**The designation of the use of funds raised by fees and taxes can impact their acceptability by those upon whom they are assessed.** Taxes and fees not earmarked for specific uses can offer greater flexibility to the government or EPR assessing them. However, earmarking for specific waste reduction projects, funneling back to those paying the fees in a manner that does not promote waste production, and/or offsetting such taxes or fees with reductions in other payments can reduce opposition to such policy instruments.<sup>[5]</sup>

The following is a brief survey of several types of such instruments in the EU, beginning with charges for disposal and continuing to fees for plastic itself.

#### 2.2.1.1 Landfill fees

One of the most common economic instruments in place in the EU and other countries around the world, is a landfill tax, the objective of which is two-fold: a) To cover the costs of waste disposal, including externalities (costs of pollution born by the environment and/or the public at large), and b) To serve as a disincentive to dispose in landfills. Though official policy calls for “full-cost pricing” because the costs of externalities are often difficult to determine with precision, landfill fees generally consist of an amount covering actual disposal costs and an additional amount that is often not based on any hard research, but rather, meant to be sufficient enough to deter disposal. Often these are listed separately as “gate fees” and “landfill taxes” respectively<sup>[6]</sup>

- **In order to be an effective disincentive to landfilling, fees need to be sufficiently high relative to alternatives such as recycling or incineration.** For this reason, landfill fees in the EU tend to be relatively high (see, EEWEP, 2020, and Figure 5) and have been

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[4] Under an assumption of rationality in economics, the distinction between the terms fees, surcharges and taxes, would be relatively meaningless in terms of the expected impact on behavior. However, insights from psychology and behavioral economics indicate that people may relate to the terms differently, as they may have pre-dispositions towards the legitimacy, acceptability, or desirability of taxes, for instance, or of government vs. non-government initiatives, etc. However, in this section, they are treated alike.

[5] The process of levying a fee/tax/surcharge on a good with high externalities and combining it with a reduction in distortionary taxes or fees on other items, such as income tax, employment taxes, etc. is known in the literature as a “double dividend”, in that it reduces two types inefficiencies without a net increase in tax collection.

[6] See, for example, <https://www.eea.europa.eu/data-and-maps/figures/typical-charge-gate-fee-and>

increasing over time. Too high of fees, however, can result in illicit dumping of waste if waste streams are not well monitored. Those bearing the cost of landfill surcharges tend to be municipalities and local authorities, though large private sector actors in some cases dispose their waste directly to landfills.

- Funds generated beyond covering operating costs of landfills are designated for various uses in different EU countries. In many cases, the fees go into some type of “waste fund” which can be used to fund waste reduction projects.
- A problem with landfill fees is that they are not closely targeted to the producer of the waste, but rather at the municipality collecting that waste. Therefore, they are an indirect incentive to reduce waste. Many countries have adopted some sort of Pay As You Throw (PAYT) system, in which individuals are assessed differential waste disposal fees based on the amount and type of waste they produce and the times it gets collected. While such PAYT systems are increasingly popular and do provide a direct incentive to reduce waste, they also add new levels of complexity to municipal waste collection, as waste needs to be weighed or estimated (e.g. by the size of the bin) at the source and can also lead to illicit waste disposal in order to avoid fees (Elia et al, 2015).

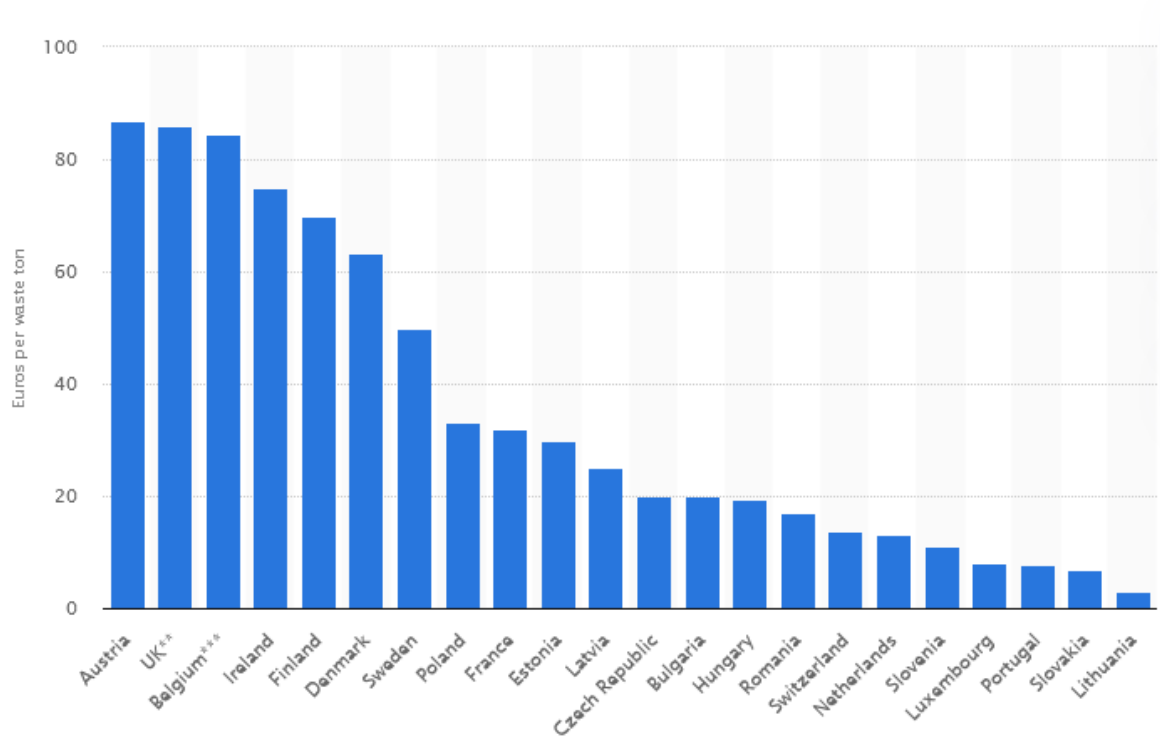


Figure 5. Landfill fees in selected EU countries (as of 2017)

(Source: <https://www.statista.com/statistics/986324/landfill-tax-in-europe>)

### 2.2.1.2 Incineration fees

- Incineration is the primary alternative means of waste disposal in many EU countries. In some, such as Sweden and Denmark, incineration represents the primary means of waste disposal, accounting for more than half of all waste, while landfilling rates are in the single digits only (Eunomia, 2017). Incineration is often labeled as waste-to-energy or energy recovery and seen as a preferred alternative to landfilling. As a result, gate fees and taxes

for incineration tend to be lower than those for landfilling.<sup>[7]</sup> The efficacy of incineration fees is also a function of the cost of alternative sources of energy, and thus, are also affected by fuel costs as well as other costs such as carbon taxes (Olofsson et al., 2005).

- There is growing recognition in the EU, however, that incineration can be an inefficient use of resources. The EU Directive for plastics in a circular economy from 2018, specifically calls for the implementation of economic incentives such as incineration fees in order to prevent the incineration of potentially recyclable materials. As a result, countries with high incineration rates such as Germany and Sweden are seeking to implement “**economic instruments, such as taxes or charges... to promote waste prevention, make reuse and recycling more economically attractive and shift reusable and recyclable waste away from incineration.**” (EU Country Report Sweden, 2019). As a result, incineration gate fees have been increasing (EUWID, 2019), and are expected to increase further over the coming years. There is a risk, however, that higher incineration gate fees will lead to alternative disposal methods that are less environmentally desirable, such as cement kilns, as happened in Germany (EIB, 2002).

### 2.2.1.3 Plastic surcharges & taxes

**In addition to taxing plastic disposal options, many EU countries have some type of fee or surcharge on plastic production and/or import.** This includes both government mandated taxes as well as surcharges implemented within various EPR programs. The European Council approved the introduction of the “plastic tax” from January 1, 2021. EU member states are to pay 0.8 euros to the EU budget for every kg of non-recycled plastic packaging waste (European Commission, 2019; Council of the European Union, 2020). Opinions regarding the tax are mixed, and there is disagreement over the primary goal of the tax - whether it is primarily an instrument to disincentivize plastic use and stimulate recycling or rather simply a means of raising funds for the EU and member country budgets, which may or may not then be used to address plastic waste issues (Walker et al, 2020). Industry representatives, including the European Plastics Converters (*EuPC*), have come out against the tax, and/or have suggested taxation of plastic waste disposal, rather than plastic production or imports (Matthew et al., 2021). It is not clear how the EU tax will be integrated with existing national level taxes and surcharges.

Tax structures often offer varying rates depending on levels of environmental impact or achievement of specific environmentally related criteria (eco-modulation). For instance, **national taxes and fees are often adjusted based on the level of recyclability of the products.** In the Netherlands, for example, the body established within the national EPR system assesses a fee of 0.67 Euro (excluding value added tax (VAT)) per kilogram (kg) of plastic. All producers and importers of more than 50,000 kilograms of packaging material into the Dutch market are subject to the fee. This fee is reduced to 0.41 Euro (a nearly 40% discount) for rigid plastics that are proven recyclable (Afvalfonds Verpakkingen, 2021; Suez, 2021b)

Under the latest update to the Dutch system, bioplastics are assessed a rate similar to that of fossil fuel derived plastics. This reflects the fact that **many bioplastics, while made from organic materials, do not readily biodegrade into organic matter, and need to be sorted**

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[7] See, for example, Dick & Scholes (2019).

**into a separate waste stream in order to be recycled.** Also, consumers tend to have little awareness of the need to separate these items, which can complicate and add costs to their recycling.

France's EPR has an even more detailed surcharge structure, with at least seven different rates, depending on the type of plastic (e.g., PET, PE, PP, PVC). It also goes beyond the Dutch system in that it not only provides different rates for flexible vs. rigid packaging, but also different rates for colored vs. clear PET bottles, to reflect the additional costs incurred in recycling colored bottles and the smaller market for such recycled products (Suez, 2021a). In addition, fees are doubled for plastic bottles and other containers for which no recycling channel currently exists (Watkins et al, 2019). France's system is an example of a relatively advanced **bonus-malus system**, in which increased fees ('malus') are levied on undesirable packaging, while reduced fees ('bonus') apply to packaging with a lower environmental impact.

**Some countries have taxes on specific product designs or chemicals that are deemed problematic.** Lithuania, for instance, levies a tax specifically on multilayer laminates that are more difficult to recycle (Kivo, (2021). Denmark applies a tax to certain soft PVC products, and the tax is reduced if the products do not contain phthalates (Watkins et al., 2019).

**Other taxes and surcharges distinguish between the level of recycled content in the product.** The UK, for instance, has a plastic tax that will come into effect in April of 2022 that will assess a surcharge of 200 pounds per ton of plastic on all plastic packaging produced in, or imported into, the UK, which does not contain at least 30% recycled plastic. Primary and secondary products exported will be exempt, as will imported transport / tertiary packaging (Valpak, 2021). Packaging containing multi-material components will be classed as plastic packaging if they are predominantly plastic by weight. The **tax will apply to plastic packaging on a per component basis.** Liable businesses will need to provide **evidence** that the packaging in question contains sufficient recycled content. Other such taxes include Italy's tax on single-use plastic, which includes exceptions for compostable plastic or plastic made from recycled materials, and Finland's tax on plastic packaging that is not made from renewable natural resources.

Similar plastic taxes and fee systems are expected to be implemented in additional countries as well. Spain, for instance, recently approved a bill proposing a €0.45/kg tax on single-use plastics in packaging to be charged to the manufacturer. This is in addition to further taxes on their incineration and disposal in landfills (Argus Media, 2021). Italy too, is set to implement a tax on single use plastic (Scuderi, 2021) and the Netherlands may also implement a plastic tax, in addition to the fee paid to the EPR. Such taxes are more likely given the need by countries to finance the 0.80 Euro per ton tax they need to pay to the EU as part of the 2018 Directive (Scuderi, 2021).

In the cases listed above, **achieving lower rates for materials that meet the recyclability or recycled content criteria involves a level of certification and burden of proof that also imply regulatory and compliance costs.** It is not clear how much these costs are relative to the taxes. While they are presumably substantially less, they are not likely to be negligible.

In addition to these broad taxes, there are **a number of item specific taxes on plastic goods** in place or proposed in Europe and elsewhere. These include taxes on the plastic bag, straws, and other single use plastic items. Because of the high elasticity for such items, these taxes have by and large been very successful in reducing consumption, though they tend to focus on small shares of the overall waste stream. Also, in many cases it is necessary to update and increase fees after the initial shock of the introduction wears off and consumers adapt to the



reality of having to pay for something that was previously free. It is not clear what the future is for such taxes in the EU, however, as many types of single use plastic items (including bioplastic) such as straws, plates, cutlery, and others, are banned from the EU as of July of 2021 as part of the 2018 EU plastic waste directive.

In some instances, **taxes can be nullified if designated environmental goals are met**. For instance, in Norway, a fee is assessed for every plastic bottle, as is common in many bottle deposit refund schemes. If recycling rates for these bottles are above 95 percent nationwide, then every producer, no matter what, is exempt from the tax (Casella, 2019). Despite this high bar for tax exemption, this goal has been routinely met every year for nearly a decade.

The European Commission (2017) laid out **criteria and features that should be present in any economic instrument used for environmental purposes, including taxes**. These include:

- Defining clear objectives;
- Defining the tax base;
- Introducing the tax and reducing opposition;
- Modifying rates according to performance and outcomes;
- Managing administrative costs (stakeholders);
- Influencing behaviors with monetary punishments and rewards;
- Communicating with clear and positive language;
- Defining the use of revenues;
- Monitoring and evaluating the impacts of the tax.

Of course, these are not always easy to do in practice. Observers have noted that several actions can be taken to increase the acceptability and effectiveness of such plastic taxes, including complementing the tax “with educational incentives that would heighten people’s awareness of the overall problem” or “with programs/incentives for innovation in the production and recycling of plastic... [such that] the revenue generated from the tax can serve to balance the effect of the tax burden.” (Walker et al, 2020).

Sanz et al (2018) identified various stages in the value-chain in which taxes could be implemented depending on the target outcome. A schematic presentation of this is shown in Figure 6. Differentiated taxes may be more effective than across the board ones but are more complicated to implement. Thus, there can be a tradeoff between transparency/clarity and precision.

As mentioned, in many cases the role of the government is to set goals for waste reduction, recycling rates, or recycled content, but the actual implementation is left to a body established under an EPR or some other private sector or not for profit body. In such cases, **it is important that clear sanctions for non-compliance are laid out. The effectiveness of the policies and the incentives for compliance may be a function of the rate of penalties for non-compliance**. Italy’s new plastic tax, for instance, specifies penalties for failure to pay, late payment, and late filing of required documentation (EY, 2020). Unfortunately, clear policies regarding non-compliance are not always present in EU countries, leading to confusion, and even court cases to establish enforcement mechanisms.

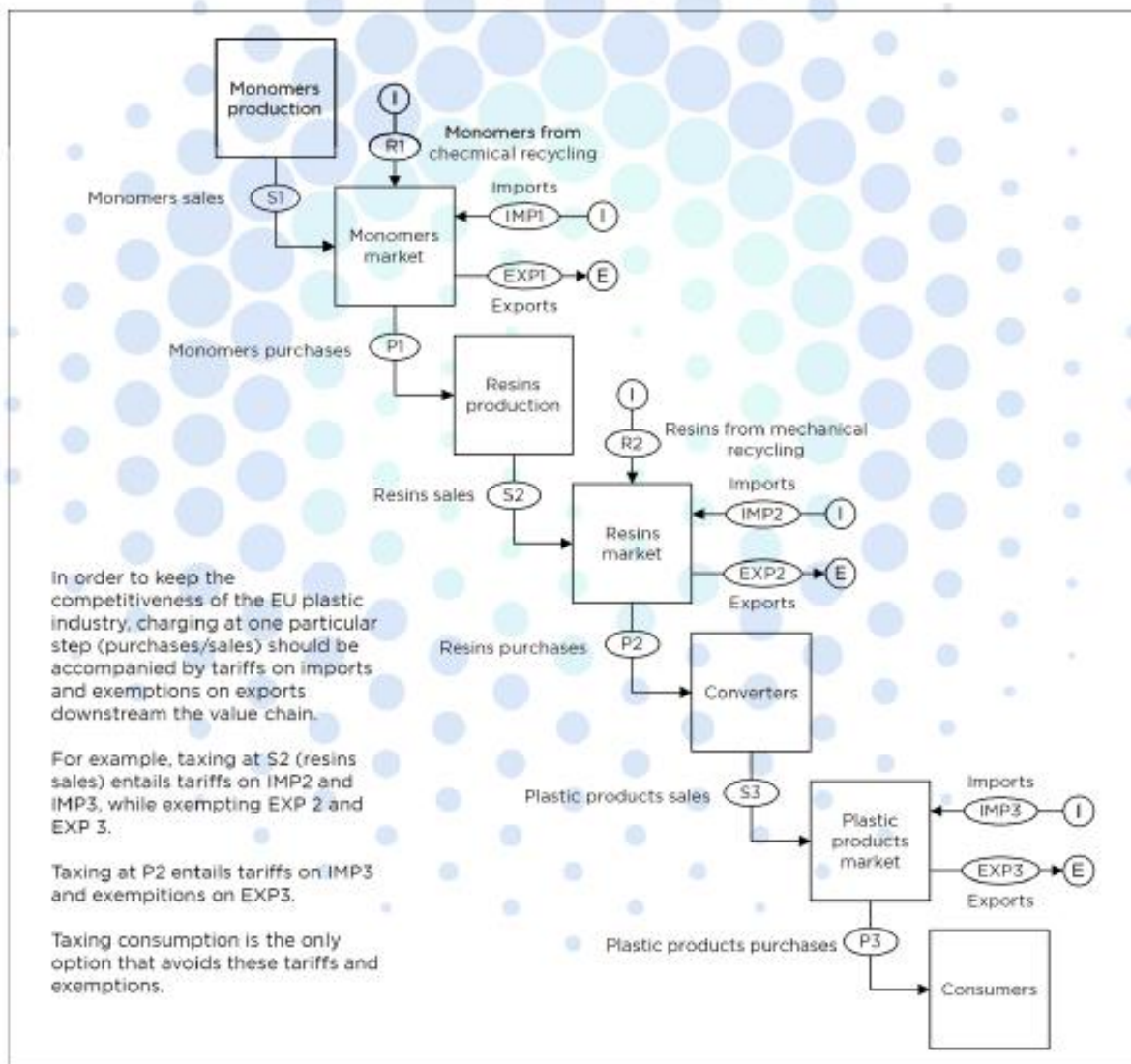


Figure 6. Stages at which a plastic tax could be levied  
(Source: Sanz et al., 2018)

### 2.2.2 Subsidies & financial support

In addition to the “sticks” of the surcharges and taxes, many countries provide “carrots” in the form of financial support for initiatives that can reduce waste in general and plastic waste. Types of support range from direct allocation of grants to soft loans, to tax credits for innovation. While this section focuses on government policy incentives, it is important to note that there is quite a bit of financial support for circular economy and waste prevention and treatment initiatives that is wholly within the private sector, including private banking and investment firms and dedicated venture capital funds. <sup>[8]</sup> One of the primary tasks of

[8] See, for example, Tukiainen (2020) or Closed Loop Partners, <https://www.closedlooppartners.com>



government incentives is allowing initiatives to better access and leverage potentially available private sector funding.

A particular focus of waste management incentives is for research and development (R&D) stages for new technologies or techniques, assisting with early stages of projects in order to allow them to achieve a level at which they are self-sustainable (bridging the so-called 'valley of death' between research and commercialization) (Uusitalo, 2020). In some cases, financial support is put in place in order to provide services that exhibit public good aspects and/or are essential for waste treatment or reduction but are not in and of themselves profitable. In many cases, funding is made available to assist with projects with high initial capital costs, but manageable operating costs. High upfront investment costs are one of the most frequently cited barriers among European stakeholders and businesses to implementing a circular economy (Kirchherr et al., 2018). Some forms of financial assistance or incentives are meant to offset risks involved in waste prevention and reduction initiatives, such as the risk of failure of new technologies, risk of rapid and drastic price fluctuations, risk of changes in demand or supply chains, and risk of currency or interest rate fluctuation.

According to a European Commission report on the transition to a circular economy (European Commission 2019) the following are situations in which incentives are appropriate:

1. Level playing field incentives that enable the circular business to have a better chance to compete and succeed in the market.
2. Value chain collaboration incentives to enable and reward collaboration to optimize circular economy solutions.
3. Long-term value creation incentives to reward product longevity models
4. Market participation incentives to engage end-users in the value chain to ensure circularity of products and material.
5. Integration of public good incentives to take into account the cost of negative externalities and the benefits of positive externalities.
6. Finance knowledge build-up incentives to increase the understanding of financing circular business models.
7. First mover's action incentives to create market demand and engage consumers in circular business models.

#### *2.2.2.1 Retraction of harmful subsidies*

According to the EU's 2018 Directive on plastic and the circular economy, **the first priority of EU and its member countries regarding subsidies affecting waste is the retraction or phasing out of existing subsidies that inadvertently promote plastic waste and/or reduce the possibilities for reuse or recycling of plastic waste** (European Parliament, 2018). All countries are called on to identify and eliminate such subsidies (European Environment Agency, 2019). Because plastic prices are, in large part, a function of the cost of oil production or refining, subsidies to the oil sector are one such category. In addition, several countries provide subsidies or some type of financial assistance for waste incineration, on the basis of it being a source of energy recovery. However, incineration of potentially recyclable

materials is contrary to the stated objectives of the EU's Directive, and EU member countries are now being asked to cancel or reform these subsidies (Recycling Magazine, 2018).

#### 2.2.2.2 Provision of finance - subsidies and loan assistance

The EU, the member states, and many of the affiliated financial institutions are committed to providing finance for environmental projects. The European Investment Bank (EIB), the EU's foremost lending institution, for instance, has committed to dedicating more than 50% of all financing to climate and environment related issues by 2025. This specifically includes waste reduction and recycling initiatives. Finance can be targeted both to private sector initiatives as well as public sector ones. The European Regional Development Fund (ERDF), for instance, funded a project to highlight best practices in waste prevention (PRE-Waste) among public and private sector partners in nine countries (ACR+, 2021). National and regional development banks such as the Nordic Development Bank or Germany's KfW, also have specific waste management lending initiatives and mandates. Sources of funding are varied and include EU level funding institutions and initiatives such as the EIB, ERDF, and European Bank for Reconstruction and Development (EBRD), as well as national level funds, both from ministerial budgets, development banks, dedicated environmental funds, and well as a range of public-private partnerships, as well as private sector financial institutions.

Different types of support include:

- Direct provision of grants
- Soft loans (loans offered at terms preferable to general market terms)
- Loan guarantees
- Debt forgiveness programs

**Terms of soft loans can include lower interest rates (or in some cases, even interest free loans <sup>[9]</sup>), longer tenors and payback periods, higher lending amounts, and lower collateral requirements.** Several programs allow for **partial differentiated subsidizing of waste management activities** depending on the project cost or exemption from loan repayment in case of unsuccessful completion of risky projects.

Certain types of activities are eligible for especially high rates of financing. In France, for instance, R&D costs related to waste management and the circular economy are eligible for subsidies of up to 70%, depending on the beneficiaries, as are projects by SMEs and municipalities developing design work and decision-making support systems that make use of external consultancy services (up to a cap of 100,000 Euro) (Business France, 2018). In Denmark, the legislation provides subsidies for non-profit projects covering up to 100% of costs. Forgiveness of part of all the loans, conditional on meeting various criteria (environmental or otherwise), is also an incentive in place in some EU countries. In Poland, for instance, low-interest loans are offered to enterprises and organizations that use waste. If the planned production capacities, for which a loan from the fund was allocated, are put into operation on time, the loan received is repaid only by half.

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[9] The Czech-Moravian Guarantee and Development Bank (ČMZRB), for instance, offers interest free loans for small and medium sized enterprises (SMEs) for waste management projects (<https://www.cmzrb.cz/en/financial-instruments-will-support-new-technologies-for-waste-management>)

In terms of risk sharing, **several governmental finance schemes cover part or all of the costs of R&D and innovation projects that fail**, while in cases of successful implementation of the project, the recipient of the loan pays the bank the risk premium, which is in excess of the established rate. Some have suggested additional risk sharing mechanisms. For instance, a report for the UK waste market recommended a series of measures to cover the risk from price fluctuations of secondary raw materials (R&WUK, 2015). Such recommendations include risk-sharing contracts between contracting partners, hedging mechanisms such as ‘exchange-traded future contracts’, and price guarantees. In some places, mechanisms such as guaranteed lower bound prices (price floors) have been established for sorting and processing of plastic waste. Such a system has been used in Seattle, for instance, by which the processor of recyclable waste:

“Derives its income from the sale of processed recyclables in the open market, as well as a tonnage-dependent compensation on recycled waste paid by the City of Seattle. This is complemented by a lower bound price guarantee paid by the City of Seattle in situations of a substantial drop in market prices.” (Stromberg, 2004).

Several financial institutions issue environmental bonds to specifically fund environmental initiatives, including waste treatment (see, for instance, Tukiainen (2020), or [https://www.nib.int/investors/environmental\\_bonds](https://www.nib.int/investors/environmental_bonds)). Such funding operations typically have environmental criteria both for lending and for impact monitoring during and after project implementation. Revolving funds are also increasingly common for circular economy initiatives.

### 2.2.2.3 Tax credits

In addition to the differential tax structure designed into the various plastic taxes mentioned above (eco-modulation), **several countries offer reductions in other taxes for initiatives that reduce or treat waste, including plastic waste**. Several EU countries offer **tax breaks for repairs of items**, in order to extend the life of goods before reaching eventual disposal. In many, minor repairs of items are exempted from or are assessed a reduced VAT. In Sweden, 50% of labor costs for repairs of large household appliances are tax deductible (up to a maximum annual capped value) for repairs performed by professionals at the owner’s home. A similar system is in place in areas within Austria (RReuse, 2017).

In many countries throughout Europe, and around the world, **resource-saving R&D expenditures can be fully deducted from taxable profit by the company** and are charged to production costs. In France, for instance, waste management projects can be eligible for tax exemptions from corporate property contribution (CFE), a type of real estate tax. Many states within the United States offer **tax credits to industry, municipalities and even individuals for equipment or other investment in recycling**. In most cases, the credit is limited to a percentage or fixed sum of investment and must provide proof of attainment of specific environmental criteria, for instance, handling a specific percentage of postconsumer solid waste (EPA, 2016). In some cases, companies involved in waste recovery are also eligible for tax breaks on sales taxes, employment taxes, and real estate taxes.<sup>[10]</sup> In the EU, **proposed**

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[10] For a review of types of recycling tax credits in the US, see:  
<https://archive.epa.gov/wastes/conserve/tools/rmd/web/html/rec-tax.html>

**tax credits include reducing VAT secondary materials and recycled products, or exempting them from VAT altogether** (European Parliament, 2018; Uusitalo, et al., 2020).

### 2.2.3 Deposit-refund systems

**Deposit-refund systems (DRS) are essentially a combined tax and subsidy instrument**, in which the purchase of a good is taxed and the return of the used item is subsidized at the same rate. Over 40 countries have such systems for plastic bottles. The deposit tends to be a flat fee, regardless of package size, though some, like Norway's bottle DRS, have fees that increase in accordance to bottle size. While differentiated deposit fees based on package size may more accurately reflect actual recycling and externality costs, reasons for not implementing such a system include fears they are more complicated, involve additional oversight and management, and that they may potentially promote the use of smaller bottles, which would not necessarily reduce plastic waste.

While DRSs for plastic tend to be for bottles and other containers, they have been used for other products as well, for example, types of transport packaging such as boxes or pallets (Uusitalo, et al., 2020). They are also widely used for other waste streams, such as glass and metal, and have been proposed for many more, including electronic waste and construction waste.

In some cases, DRSs are an optional program that producers of plastic can choose to implement or join in lieu of some other form of collection or payment of a waste fee. For instance,

“a beverage packaging tax of EUR 0.51 per liter must be paid for beverage packages in Finland. However, manufacturers and importers of beverage packages can be exempted from the beverage packaging tax by joining a deposit-based recycling system approved by authorities or by organizing one themselves. A separate membership fee is paid for the membership of each recycling system.” (Uusitalo, et al., 2020: 31).

Norway's DRS, which as mentioned above, routinely recovers more than 95% of bottles for recycling, also compensates store owners where the bottles are returned to the extent that recovering the bottles can actually increase business (BBC, 2018).

## 2.3 Incentives for plastic waste treatment in Israel

### 2.3.1 Current state of plastic waste incentives in Israel

Achievements in waste management in Israel lag behind most European countries. Israel's per capita waste production is among the highest of OECD nations and its landfill rate is one of the highest, this is a country with land at a premium, with one of the highest population density rates among OECD members. Of particular concern is post-consumer waste production, with pre-consumer, business-to-business, waste widely considered to be better managed.

**Bottlenecks and obstacles specifically to plastic waste reduction and recycling in Israel** have been identified and described in other reports submitted within the framework of the UNIDO project for which this report was written. These include:

- A small domestic market
- Little competition and many cases little room for competition due to the small market size

- Lack of capacity, especially in sorting
- High discrepancy between the cost of virgin and recycled materials
- A poor match between availability and demand, especially in the domestic market
- Variable and uncertain quality of recycled materials
- Mixed material waste products
- Regulatory burdens
- A sense of apathy/complacency among consumers

Many of the barriers faced by Israel are shared by many other countries, including those with much higher recycling rates and much lower landfilling rates (e.g., Ljungkvist Nordin and Westöö (2019). In addition, there is the potential for leakage of waste, including plastic waste, to the West Bank. On the upside, **the small geographical size of Israel is an advantage in terms of the ability to transport waste to sorting and recycling facilities and ultimately to users of secondary materials.**

Existing incentives for plastic reduction and recycling in Israel include:

- Bottle deposit-refund system for small bottles, currently being expanded for bigger ones
- Plastic bag tax
- Landfill fees
- Various funds made available for project finance from the Ministry of Environmental Protection, the Ministry of Economics, and the Israel Innovation Authority
- A relatively new government program to match potential buyers and sellers of waste

These incentives have had varying levels of success. Post-consumer packaging waste, collected in orange-colored bins, is a mix of plastic, metal, paper and other potentially recyclable materials. The Tmir corporation, established by Israeli producers within the framework of the country's EPR, is the sole recognized collector and sorter of packaging waste. Recycling rates remain low.

The bottle DRS, which has been in place for decades already for bottles less than 1.5 liters, has been moderately successful in reducing PET plastic. According to the State Comptroller, 78% of such bottles are collected separately from the general municipal waste stream, compared to 57% of large bottles not covered by the DRS (State Comptroller, 2021a). These collection rates are still well below those of leading European countries. According to one estimate, typically, countries with deposit refund schemes for plastic containers achieve recycling rates of approximately 80-95% (EAC, 2017). A cost-benefit analysis of the system demonstrated that it provided clear benefits to the economy (Lavee, 2010). The overall effect of the DRS, however, has been limited due to the fact that it was limited to small bottles, which account for a relatively small proportion of plastic beverage containers.<sup>11</sup> The planned expansion of the deposit to include these larger bottles should contribute to the reduction of PET plastic waste in Israel. The system, however, still has issues of financial viability. Recently, towards the new expansion of the deposit, two factories of PET recycling were established in Israel, "Aviv" and "Green PET".

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<sup>11</sup> According to the State Comptroller's report (2021a), in 2008, drink bottles represented 28.5% of the volume of municipal waste landfilled in Israel, with small bottles representing 6.5% and large bottles 22%.



In addition, while, in theory, all sellers of bottles are mandated to accept returns and refund the deposits, in practice, the large supermarkets and retailers are the ones who end up receiving the overwhelming majority of returns. Several representatives of retailers in Israel have complained about having to dedicate space to bottle collection and indicated that this is an economic burden for them.

Like its counterparts undertaken elsewhere, the plastic bag tax, of 0.1 ILS per thin nylon bag, has been successful in dramatically reducing the number of plastic bags consumed.

The landfill surcharges in Israel are currently (as of January 2021) at 108.73 ILS (~27.9 Euro) per ton of mixed waste. Introduced 2007, this fee has increased substantially, more than doubling over the past decade. That said, the fee is still low compared to many countries in Europe, including those with much greater capacity and lower population density. Already in 2010 the Ministry of Environmental Protection called for increasing the fee to 125 ILS per ton, however, increases of the fees face significant political opposition, and increases have been relatively gradual.

Money collected from these charges go into a government administered fund that is available to fund public and private sector waste initiatives. It is unclear to what extent landfill fees serve as an effective incentive for waste reduction. They serve only as an indirect incentive in that they are not applied directly to the producers of waste, but rather on the collectors of waste, primarily municipalities and regional governments. While these municipalities can apply for funding for waste management projects, many, especially smaller ones, do not have the capacity or resources to develop such proposals on their own. As such, the landfill charges are essentially a tax on municipalities and a revenue generating instrument, rather than an actual incentive for waste reduction. This explains much of the public opposition to increases.

In addition, while municipalities can implement sorting and collection initiatives, they do not have the capacity to actually recycle waste. The lack of capacity limits the extent to which their efforts will have any meaningful impact. Previous attempts to sort waste which resulted in sorted waste ending up in landfills have discouraged many among the public from actively participating in separation at source schemes. Waste handlers can also export the plastic for recycling outside of Israel. However, due to the low landfilling fee, this is rarely profitable.

Two sectors responsible for non-municipal solid waste include the construction (0.33M ton per year that 33% of the total plastic waste) and agricultural sectors (35-50K ton per year). According to estimates in the UK, for instance, construction is second only to packaging in terms of plastic waste (Ray, 2019). Plastic components of construction waste include pipes, pallets, and packaging from various building materials. Plastic in the agricultural sector includes pipes, irrigation equipment, nets, and sheets used to cover fields and crops.

Over 6.2 million tons of mixed construction waste in Israel were produced in 2019 (State Comptroller, 2021) out of which approximately. 5% are plastic products (based on interviews with C&DW recycles). The recycling rate for construction waste stood at 55.4%, which is an increase from previous years but is still very much behind rates in many European countries. The value of recycled construction waste in 2019 was estimated at 127 million shekels, with the lost value of non-recycled waste as much as 120 million shekels (State Comptroller, 2021).

Landfill surcharges for construction waste are substantially less than for mixed municipal waste and stand at just 4.83 shekels per ton. One of the reasons for lower fees is not to encourage illicit disposal, however, even at these low rates, it is estimated that roughly 2.2 million tons of construction waste were dumped in open spaces in Israel in 2019 (State Comptroller, 2021).

Agricultural plastic waste is much smaller in magnitude than that of the construction sector. Rough estimates place the amount of plastic waste in the agricultural sector in Israel at between 35-50 thousand tons per year, of which, it is estimated that roughly 20% is recycled and 40% is disposed of illegally (Ackerman, 2021). Of this, plastic pipes, which represent 20-25% of total agricultural waste have a relatively high collection and recycling rates, meaning the rates for recycling of other types of plastics, especially plastic sheets, are even lower than the figures provided above (Ackerman, 2021). Estimates for the current cost of collection and transfer of agricultural plastic waste in Israel to ports or factories is over 1300 shekels per ton, while the sale value of the materials is just 500, less than 40% of the cost before recycling (Ackerman, 2021). Recycling agricultural plastic waste is also complicated by the fact that materials are often contaminated with dirt and other materials that present both technical and economic challenges.

### 2.3.2 Recommendations on plastic waste incentives in Israel

In light of the current state of practice in Israel and abroad and following meetings and interviews with representatives of the packaging industry, retailers, waste management professionals, and government representatives, we offer the following set of recommendations for incentivizing the reduction of plastic waste in Israel.

#### 2.3.2.1 Financial incentives

1. **Increase of Landfill Fees** - Landfill fees are too low to affect change and should be raised to reflect full costs (including external costs) and to serve as a serious disincentive to landfilling. Because this is a burden on municipalities and local authorities that are not equipped or capable of substantially reducing their waste streams, mechanisms to automatically funnel back a greater portion of the waste fees to the municipalities should be developed. That is, in order to reduce opposition and financial burden placed on municipalities, some portion of the funds raised should be returned directly to them, but this, of course, should not be proportionate to the amount paid into the system, so as not to nullify the incentive structure.

In light of the limited capacity currently available for recycling, fee increases should be implemented at a graduated pace, commensurate with the development of recycling and other alternatives. Without more sustainable alternatives in place, a price increase will just end up being an additional tax, and not an actual incentive. In addition, too high of a landfill tax could result in illicit dumping, especially in cases of less regulated waste streams such as construction waste. On the other hand, knowledge of future price increases is part of the incentive structure necessary to promote investment in sorting and recycling capacity. While there is opposition from local authorities to raising the landfill fees, as they will bear the economic burden of such increases, the government is encouraging and financially assisting in the establishment of alternative end of life facilities suitable for sorting and recycling waste, for example:

- A call for proposals of construction and operation of advanced treatment facilities for construction waste (100 M ILS).
- A call for proposals to increase the collection originated and separated for recycling within the local authorities (149.5 M ILS).
- A call for proposal of construction or upgrading municipal waste sorting facilities (240 M ILS).
- A call for proposal of operation of municipal waste sorting facilities (300 M ILS).



Support is therefore available for measures to reduce landfilling, and it can be the basis for increasing landfilling fee, which would be paid by local authorities that have not come up with plans to divert waste from landfills.

2. **Creation of dedicated funds to developing municipal recycling programs** - While landfill funds are available for use by local government, as mentioned, they often go unutilized or underutilized by them. Most local governments do not have the capacity to design waste programs. The funds could be used to fund program designs for the municipalities, and/or could fund the hiring of external consultants by these municipalities for this purpose.

Examples for fund allocation goals:

- Increases recycling or collection rates.
  - Expands and optimizes curbside recycling collection programs where appropriate.
  - Improves the quality of the recycling stream through reduced in-bound contamination.
  - Enhance the performance of curbside recycling and other recycling programs.
3. **Incineration fees** - The Ministry of Environmental Protection new waste management plan prioritizes separation at source. However, incineration and waste-to-energy projects are preferable to landfilling and will continue to be part of the overall national waste management system. Subsidies and financial support for such systems, if left in place at all, should be limited to construction phases and should not cover operating costs. Eventually, such support should be phased out altogether and incineration should be assessed with gate fees that reflect actual costs, and an additional incineration charge to reflect the environmental costs of incineration. Ideally, this would include externalities. The total disposal fees for incineration including gate fees and any tax, however, should be lower than those for landfilling.
    - Currently, the Ministry for Environmental Protection aims for incineration of 26% of the mixed waste by 2030. Our recommendations for raising the incineration fees are referring to these figures.
  4. **Tax on production and import of virgin plastic** - The government should consider issuing a tax on both the production and import of virgin plastic materials. The motivation for such a tax is two-fold: a) incorporation of the eventual environmental and social cost that plastic imposes, and b) making recycled materials more competitive on the local market by reducing the price gap between virgin and recycled materials. Given that Israel already has taxes on plastic bottles and bags, this fee may be waived for such products so as not to involve double taxation. Alternatively (or in addition), the government may wish to implement differential taxes on single use and/or disposable plastic items relative to reusable ones.
    - A tax on plastic does risk the creation of an increased incentive for use of substitute materials, some of which may have even greater environmental impacts than plastic, however, evidence from taxation of plastic bags and other plastic taxes worldwide did not indicate any net negative environmental outcomes. As such, while the possibility exists and the government should be aware and ready to adapt the policy in such an event, it remains unlikely.
    - Various types of eco-modulation should be considered to adjust for the different levels of environmental impacts associated with each specific type and quality of plastic. Tax incentives should be developed to encourage investment in the recycling system and infrastructure improvements. The issues of true cost pricing and tax shifts are being widely debated in Europe. Some tools are taxing plastic use or production.

- To allow Israeli producers a competitive advantage (in the UK) or a level playing field (in E, it would be more beneficial to adapt the EU-obligation on the use of 30% recycled content.

#### *Taxes to plastic manufacturing sector*

This is a new tax that will apply to plastic packaging manufactured in, or imported into the UK, that does not contain at least 30% recycled plastic. Plastic packaging is packaging that is predominantly plastic by weight.

It will not apply to any plastic packaging which contains at least 30% recycled plastic, or any packaging which is not predominantly plastic by weight.

Imported plastic packaging will be liable to the tax, whether the packaging is unfilled or filled.

(Source: gov.uk)

#### Box 1. New taxes to plastic manufacturing sector

- We would like to mention that it is the position of the manufacturers' association that a tax on virgin material is not economical due to the unavailability of high-quality recycled material in Israel. It is also their position that there can be no discussion on taxes until there is sufficient recycling infrastructure or availability of imported/local recycled material.
5. **Tax credits for PCR containing products and recycling facilities** - Tax credits, for instance exemption from VAT, or reduction in various other taxes (corporate profit, land taxes, etc.) should be considered for products with recycled materials and for companies whose primary occupation is in the waste minimization and/or resource recovery sector.
- In other parts of the document, we recommend promoting products made with PCR (post-consumer recyclates). An incentive scheme that would subsidize such products could assist in the early stages of getting them on the market. Such products could also be incentivized by using standards such as GreenBlue's Recycled Material Standard (RMS) that can strengthen user competency and information availability regarding PCR in products. Other mechanisms could be condition state aid to plastic producers/brands, on their use of PCR, Lower VAT on products that are recyclable or contain PCR, etc.
6. **Development of tax incentives for investment in recycling systems, Infrastructure Improvements and R&D**
- Establish tax benefits for improvements to recycling processing equipment and upgrades whereby the government contributes a certain percentage of the cost of equipment or other infrastructure upgrades through a variety of tax structures.
  - Accelerated depreciation is one model to consider - it encourages rapid investment in recycling infrastructure improvements and equipment, as the more quickly a public or private entity can use the tax benefit (write-off) associated with depreciation, the higher the project valuation.
  - Research and development (R&D) tax credits and support for investments into circular opportunities.
  - Tax incentives for reduced waste production or inclusion of recycled content.
  - Explore novel financing instruments such as green bonds and blended finance to invest in the future recycling infrastructure.
7. **Subsidizing R&D and new entries in recycling** - Given the relative lack of competition for recycling plastics in Israel, direct financial support, at least in the short term, should be given

to increase the number of parties involved in recycling. This may consist of reduced interest rate loans, loan guarantees, and other elements of soft loans mentioned above. Possible frameworks could be that of the UK, which has developed a fund specifically for supporting innovation in hard to recycle materials such as films, pouches and pots (Gov.uk, 2019) or that of the U.S.'s recently passed RECOVER Act, which provides funding not only for innovation, but also for objectives such as modernization of existing equipment and expanding recycling access and recycled materials to underserved areas (US Congress, 2021). In order to encourage private sector initiative and investment, the amount of support offered should not represent more than 50% of project costs, and an even lower cap may be considered. (See also clause 4 below)

8. **Price security mechanisms for recycled materials** - The recycled plastic market operates in extremely volatile conditions due to the price of oil affecting price of virgin plastic, and due to the availability of PCR on global markets. Focused investment in recycling infrastructure and technology is needed to produce valuable feedstock at scale.

One possible mechanism is offering lower-bound price guarantees for recycling facilities, as was done in Seattle, as mentioned above. However, while in that case, the guarantees were offered by the municipality, in the case of Israel, a national level price support system could be considered. Other Instruments that provide for some **price security for recycled materials** (e.g., futures options, long term and/or risk sharing contracts (Pew and SystemIQ, 2021; Stromberg, 2004). etc.) should also be considered. These could possibly be funded by funds from taxation on plastic or from landfilling or incineration surcharges.

9. **Support for sorting & cleansing technologies** - Efficient and effective sorting of different types of plastic is a recognized bottleneck for recycling in Israel and elsewhere. So too is the washing of plastics to ensure reusable quality. Sorting and cleansing technologies are intermediate stages in material recycling that should be prioritized for financial assistance, either through direct grants or subsidized finance.
10. **Deposit-Refund System for construction and agricultural waste** - Assessing high fees for waste disposal from these two sectors would likely result in an increase in illicit dumping. In addition, many in the agricultural sector, especially, are barely profitable as is, and additional costs could be a real economic burden. On the other hand, resource recovery rates in these sectors are low and consumers are not paying the actual costs they impose on society. For this reason, a DRS could be a potential means of addressing both areas of concern. The deposit would account for the externalities imposed by use of plastic, while a refund would incentivize the collection of the plastic. The deposit and refund also do not have to be equal to one another, if the government is interested in subsidizing some of the collection. Such a system could also potentially be appropriate for electronic waste. In order to ensure the effectiveness of a DRS system for these sectors, it is important to have a clear assessment of the cost of collection for the farmers and contractors, to provide sufficient return incentives.

#### *2.3.2.2 Regulatory & Non-financial incentives*

1. **Establishment of a national database on plastics** - Data on plastic production, consumption and disposal in Israel is piecemeal and much decision-making is based on rough estimates. Developing a central clearing house regarding types, quantities, qualities, uses, prices and

eventual end of life options for plastics in the country will allow for more efficient planning and better designed policy mechanisms.

2. **Establishment of a national database on available financial assistance and incentives** - From discussions with various stakeholders, it became apparent that not all are aware of the various potential sources of funding and financial assistance already offered by various government ministries and agencies, as well as other bodies. A centralized database listing and explaining such opportunities would likely increase their adoption.
3. **Inclusion of recycled content criteria in government procurement and government issued tenders** - Inclusion of such criteria, especially for domestic post-consumer recycled content can provide additional demand for such materials in Israel. The criteria could be minimum content requirements, or simply additional weight assigned to the criteria in the decision assessment. Of course, in the case of requirements, the government needs to ensure that the capacity to achieve them actually exists domestically. Otherwise, the result may be simply importing recycled materials rather than incentivizing domestic recycling.
4. **Reduced regulatory requirements for recycling facilities** - Israel is known to have a complex and burdensome regulatory system for private sector initiatives relative to other advanced economies (World Bank Group, 2020). Innovative waste treatment facilities should be awarded priority in terms of regulatory burdens, including expediting permit procedures, registering property, etc. Because of the lack of competition in the waste treatment sector in Israel anti-trust issues have also been an impediment to advancing various waste treatment initiatives. Exempting such sectors or at least developing specific criteria for such sectors in light of their importance and the limited potential for competition is recommended.

### 3. Suggestions for legal mechanisms

While this is not an overview of legal instruments to support recycling, below are several recommendations that we have identified as relevant to support the increased use of recycled plastic. Other countries and lawmakers are dealing with similar issues, both of increasing the use of recycled plastic, and plastic as a waste problem.

#### 3.1 Plastic bill

Numerous bills and measures have been proposed around the world, from which Israel can adopt several measures.

In the US, the [break free from plastic pollution act](#) proposed in February 2020 by Rep. Alan Lowenthal (D-Calif.) and Sen. Tom Udall (D-NM) tried to integrate all the work on plastic into one legislative measure.

Some prominent elements in the Break Free From Plastic Pollution Act

- A ban on some single-use products
- Shifting the cost of recycling from taxpayers to plastic-producing companies
- Fund recycling infrastructure improvements
- Fund consumer education on source separation

[California Recycling and Plastic Pollution Reduction Act](#) of 2020 suggests a fee for each non-recyclable or non-compostable piece of packaging sold. Indeed, the idea of taxing single use plastics and sugar-sweetened beverages is being discussed at the Israeli MoF since 2019<sup>[12]</sup> and had recently been approved.

#### 3.2 Create/Amend standards

- As described in our deliverable D.A.7, unlike in Europe, there is no Israeli standard for recycled raw materials in products (Examples of international standards on the subject can be seen in deliverable D.A.7). Lack of standards creates lack of uniformity in the quality of recycled material produced in Israel, making it difficult for manufacturers to decide to purchase recycled materials. A concise effort should therefore be done to adopt international standards for recycled plastic raw material/plastic products in Israel. Additionally, standards should also be developed for a recycling process, so that recycling factories can be verified as working based on a quality-assured protocol.
- Also worth considering encouraging consumers for better sorting by efficient labelling of the footprint/recyclability level of the package.
- Amending the definition of "recycling" in the bottle deposit law
  - Removing "incineration" from the definition of recycling or limiting it to a very low percentage
  - Limit the percentage of recovered bottles that can be exported for recycling abroad

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[12] <https://www.ynet.co.il/articles/0,7340,L-5580126,00.html>

*Australia case study (adapted from an [article](#) by Helen Millicer, director One Planet Consulting)*

The Australian government recently passed the new Recycling and Waste Reduction Act which, among other things, requires all companies wanting to export recovered plastics from 1 July 2021 to first sort the material into specific polymer types for easier processing overseas.

The second phase of the law will come into effect on 1 July 2022, and will require even higher quality processing as a condition for export - 99 per cent clean flake or pellets ready for processing direct into finished packaging and products.

As of July 2021, baled material for export must be 100 per cent PET or 100 per cent HDPE or 100 per cent ABS plastics, and no longer the poor specification combinations have been exported until now. This also means that internally to Australia, plastic converters should be better able to purchase higher quality, uncontaminated bales from local sorters and will be better able to use PCR in products. Much of the success of the new legislation depends on landfilling prices – if they are low (and they are different across the continent) there will still be a stronger incentive to landfill than to recycle. It is expected though that in the short term, due to the diversity and poor recyclability of much of the plastic packaging and products, they will see significantly larger quantities going to landfill, as it will take industry several years to install and commission new plant and equipment, and there is currently a shortfall in plastics reprocessing capacity to handle likely supply, but in the medium and long term this should shift the market towards increased recycling.

*(Source:)* <https://thefifthestate.com.au/waste/d-day-for-plastics-is-coming/>

### Box 2. Australia case study

Integrate the Israeli standards institute or one of the governmental ministries should consider establishing a certification system for recognizing recycling programs and/or MRFs that are in the top layer of technology and operations, similar to Israeli green label, the green building standard or the energy star label. This would give an incentive to such facilities to always work towards improvement.

It is also recommended that Israel adopts any application authorized by the European Food Safety Authority - EFSA (under [regulation 282/2008](#) on recycled plastic food contact material), and that has been accepted by the European commission as valid also in Israel. Applications that have been recommended by EFSA and not yet authorised by the commission, could be independently reviewed in Israel - see for example cases with the [use of recycled PP](#), [recycled PE](#), and [recycled PS](#) for food contact.

## 3.3 Eco modulation in the packaging EPR

EPR scheme should be modified based on an eco-modulation scheme. Initial recommendations were submitted to MoEP for demonstrational purposes and are not part of the recommendation in this paper.

**Option 1** - Create a simple mechanism with a simple rating system. A package that complies with all criteria shall benefit from lower EPR fees, a package that fails one of the criteria will pay a higher fee. It is of course possible to create a graded fee structure with several levels (not only binary), such as:

No adherence to any of the criteria	Full EPR fee
Adherence to one of the criteria at least, but less than 50% of them in total	Reduced EPR fee
Adherence to at least 80% of the criteria	Extremely reduced EPR fee



The criteria can be based on the UNIDO commissioned tool, developed by the Afeka Institute of Circular Engineering and Economy and the Israeli packaging institute, that details the various criteria that can define what is a recyclable package.

**Option 2** - Go deeper into the grading structure and create a weighted mechanism, and include other environmental impacts of the package that are not only related to its recyclability (such as GHG emissions in transport [including easiness of transport], use of renewable material, reduced use of fossil-based materials, package design to reduce empty volume, etc.).

#### *The German recycling law*

In effect from 1.1.19 had established a new supervising agency that oversees compliance. Every manufacturer and importer must register through a central database called "LUCID" and there are very high fines for those that do not register or register improperly.

The agency published guideline for package recyclability and differentiated pricing structure, thus creating a de-facto standard for minimal recyclability of packages in the German market.

*(Source: the national plan for CE in industry - packaging sector. A whitepaper for the workgroups 17.4.2019)*

#### Box 3. The German recycling law

Below, initial recommendations that were submitted as a draft of an eco-modulation proposal. In the end, an interactive tool for designing recyclable packaging was created in collaboration with the Packaging Institute and the Manufacturers Association and some of the recommendations were integrated there. As explained, it has not been researched or analyzed but is only for demonstration purposes:

#### The first part

Criteria	Adherence to this parameter will result low treatment fee
<b>Main substance</b>	
	Substances that are collected and recycled in Israel: PET, PP, PE, paper, glass and metal
	Materials from renewable sources - according to the % use of the material (threshold level must be determined)
	Use of recycled materials (PCR) - according to % of material use (threshold level must be determined)
<b>Composition</b>	
	MONOMATERIAL
<b>Barriers</b>	
	PET SIOX or Plasma coating
	EVOH PE of less than 5%
<b>Color</b>	
	Natural without fillers or colorants



Additional decoration on the packaging	
	Made from the same material as the packaging
Separation ability during washing	
	For PET packaging, use adhesives that are soluble in alkali or water at a temperature below 60°-80° C For PP and PE packaging, use adhesives that are water-soluble at a temperature below 40° C
	For PET packaging specific gravity of less than 1 g / 3 cm <sup>3</sup> (this recommendation was later modified)
	Maximum coverage: 50%
Caps	
	Same substance as the container Specific gravity of less than 1 g / 3 cm <sup>3</sup>
Flexible packaging	
	Composition: LDPE ,HDPE No labeling and handles

**The second part** - Adding a weighting mechanism + reference to the environmental effects of the packaging (beyond recycling)

Criteria	Weight	Adherence to this parameter will result in low treatment fee
Main substance	X%	
		Substances that are collected and recycled in Israel: PET, PP, PE, paper and newspapers, glass packaging and metal
		Materials from renewable sources - according to the % use of the material (threshold level must be determined)
		Use of recycled materials (PCR) - according to % of material use (threshold level must be determined)
Composition	%	
		MONOMATERIAL
Barriers	Z%	
		PET SIOX or Plasma coating
		EVOH PE of less than 5%

<b>Color</b>	<b>A%</b>	
		Transparent
<b>Additional decoration on the packaging</b>	<b>B%</b>	
		Made from the same material as the packaging
<b>Separation ability during washing</b>	<b>C%</b>	
		For PET packaging, use adhesives that are soluble in alkali or water at a temperature below 60°-80° C  For PP and PE packaging, use adhesives that are water-soluble at a temperature below 40° C
		For PET packaging specific gravity of less than 1 g / 3 cm <sup>3</sup> (this recommendation was later modified)
		Maximum coverage: 50%
<b>Caps</b>	<b>D%</b>	
		Same substance as the container Specific gravity of less than 1 g / 3 cm <sup>3</sup>
<b>Flexible packaging</b>		
		Composition: LDPE ,HDPE  No labeling and handles

<b>Criteria</b>	<b>Adherence to this parameter will result in low treatment fee</b>
<b>Greenhouse gas emissions during transportation</b>	
	Packaging weight in relation to the weight of the product (reference criterion must be developed)
■	The raw material for packaging is made in Israel
<b>Reducing the use of fossil sources</b>	
	Packaging made from a biological source and not from a fossil source
<b>End of life</b>	
	Consumable packaging in composting (it is quite possible that in the coming years will be a preference to demand a high price from biodegradable packaging)
<b>Reducing volume and preventing "air" packaging</b>	
	Packing volume in relation to product volume (reference criterion must be developed)

- - Long term planning horizon - Laws and policies should of course have a long-term horizon. The inability to forecast future market direction prevents entrepreneurs and investors from entering the recycling market.
  - Amending current legislation - Illegal export out of Israel, and illegal treatment of plastic prevents legal recycling plants in Israel from reaching better profitability and should be better regulated/enforced. It is still currently cheaper to export plastic waste than to treat it in Israel. Considering the GHG emissions in transport, and the desire to increase local recycling capacity, it is probably better to create an artificial barrier to export, so that recycling can be done in Israel. The bottle deposit law for example does not have any limitations on exporting the collected plastic bottles.
  - Introduce eco design laws - The European eco design directive is currently mainly focusing on the energy efficiency of energy consuming products. Upcoming updates are looking into additional environmental and circular economy aspects such as pollutant emissions, durability, reparability, recyclability, and other aspects of material efficiency and the ecological profile of products. It is recommended to adopt the regulatory trend in Europe and present minimal criteria for the introduction of products also in the Israeli market. It is up to the regulator to decide whether there should be a voluntary phase before this becomes mandatory.
  - Change rules for receiving state grants - Grants from the Ministry of Economy require the bidder to have a minimum export rate. Sorting/recycling plants do not meet these conditions and are therefore excluded from the possibility of receiving grants. The result is that they are only eligible for Innovation Authority grants that require R&D, which are smaller in scope. New non-R&D-based products can find no way to receive government assistance. Another prerequisite to receiving a grant is that you are in the production sector. Most often, recycling companies are categorized as service companies instead of industrial companies and will not be eligible for grants.

## 4. Investment in technology and infrastructure

Israel produces approximately 1 million tons plastic waste per year and only 9% of it is recycled. According to the 2014 waste survey from the MoEP, the weight percentage of packages from mixed municipal waste is 16-17%, and the plastic packaging component is 7% (of total waste mass). The other part is 84% of plastic waste that is not collected for recycling (incinerated illegally or landfilled). The 84% of packaging waste that is not collected, is sourced from the mixed waste stream.

As in Israel also globally municipal residual waste is mostly incinerated or sent to landfills as sorting and recycling of this highly contaminated stream has been considered too costly and difficult for many years. However, there are several regions where municipal residual waste is sorted and recycled. Examples include (parts of) Spain, Norway, and the Netherlands.

According to KPMG (2021) despite the separate collection systems in most countries, over 40% of plastic packaging waste in Europe is in mixed waste streams, in particular municipal residual waste. Interestingly KPMG notes that post-separating municipal residual waste is a more cost-efficient way to sort plastics (and requires less subsidization) than the pre-sorting infrastructure that prevails in most countries, because there is no separate collection infrastructure, and less incineration capacity is required (Existing incineration capacity can often be filled up by other municipal residual waste as most European countries face a shortage of incineration capacity. One ton of plastic waste can be replaced by 2-4 tons of municipal waste without plastics, as the caloric value of plastic is much higher). Indeed, recent developments in Amsterdam strengthen this position, as the city had moved from source separation to a post-separating system and canceled some curb side separation streams. If this is true, according to KPMG this offers countries that lag behind in infrastructure capacity the opportunity to catch up much more cost-efficiently "by fully focusing on post-separation instead of setting up a new costly pre-sorting infrastructure".

KPMG present an example for the ability to treat all kinds of plastic when investing in high level infrastructure:

*Morssinkhof and Omrin: sorting and recycling technologies*

The largest European recycling company Morssinkhof, that produces near-virgin-quality recycled plastic from plastic that is sorted from municipal residual waste by the sorting company Omrin. This requires significant investments in machinery, hot-washing and extensive colour sorting through near-infrared visual light sensors (refer to the table below).

Selected advanced mechanical recycling technologies		
Technology		Function
	Ballistic separators with integrated air separation	Allows for high-quality separation of 2D/3D material
	Wet grinding	The combination of water and friction (cutting) results in better washing results
	Near-infrared with visual light sensor	Enables colour sorting, especially if conducted in multiple stages, thereby solving one of the key recycling issues
	Hot-washing	Allows for better cleaning and smell reduction, enabling recycling of highly contaminated plastic waste
	Compounding extruder	A compounder allows the addition of additives, fillers and reinforcing agents, enabling higher (more homogenous) quality and production of specific characteristics (colours)
	Intermediate silos	Provides for more (intermediate) quality checks

(Source: KPMG, 2021)

**Box 4. Morssinkhof and Omrin: sorting and recycling technologies**

KPMG (2021) expects a decrease market share for virgin plastic producers that will be replaced by recycled plastic. To accommodate this demand, they recommend increasing investments in mechanical and/or chemical recycling, compounding (blending recycled with virgin plastic), and developing know how and standards for the plastic recycling industry.

It is almost obvious to recommend that the government invest more in R&I efforts to tackle the technical and market barriers to recycling. In the beginning, this can only focus on one domain, e.g., packaging.

Some examples that would help in Israel: Developing monomaterial flexible packages, integrating solutions into existing packages, removing odors, better sorting of organic waste, better water recycling for washing facilities, etc.

One such effort is the CIRCL consortium supported by the Israel Innovation Authority, which is conducting research on strategic topics, but in order to expand the model we recommend to look at the UKRI (UK Research and Innovation) [plastic packaging challenge](#).

*Examples of investment in technologies*

Four of the projects are already underway and one is about to kick off:

- [Anthropocene Mining](#), led by Evolve Packaging in collaboration with Cambond, aiming to prove the feasibility of their innovative concept which uses waste plastics destined for burning or landfill and turns them into a new engineered composite material that can, in turn, be used to make new products - helping to increase recycling rates of hard-to-recycle plastics.
- [CauliBox's Digitally-Enabled Reusable LUnch-Box Scheme \(DERLUBS\)](#), led by Cauli in collaboration with Sustainable Venture Development Partners and Westminster City Council, which will develop and trial a digitally-enabled reusable lunchbox in a scheme that rewards sustainable behaviours and replaces single-use plastic packaging at the same time.
- **CircuPlast** - assessment of a novel process technology to enable a circular approach to the management of plastics packaging waste, led by Stopford Projects in collaboration with the University of Birmingham, which seeks to demonstrate the feasibility of new supercritical water technology to enable the recycling of common single-use packaging plastics (PP, PE, LDPE, HDPE and laminates) which today's recycling infrastructure cannot deal with.
- [Reath's Reuse.id](#), led by Reath, aimed at creating an easily adoptable Open Data Standard (ODS) for a digital passport called "reuse.id" combined with software to allow track and trace options for items of packaging – knowledge that will help tackle plastic waste leaking from the system into the environment.
- [Slip additive for PET plastic packaging \(SAP3\)](#), led by Croda Europe in collaboration with Queen's University Belfast, which aims to increase the efficiency and sustainability of [PET bottle](#) production.

If successful, these projects will deliver exciting, novel and scalable solutions that can, along with SSPP's other funded projects to date and in the future, resolve some of today's problems and form part of a brighter future for plastics and our use of them.

(Source: <https://innovateuk.blog.gov.uk/2020/09/23/smart-sustainable-plastic-packaging-funding-future-solutions>)

**Box 5. Examples of investment in technologies**

A good model for investment in infrastructure is the UKRI (UK research & innovation) [Industrial Strategy Challenge Fund](#) which is investing £20 million in four cutting edge recycling plants to:

- reduce landfill and incineration
- recycle waste into new, sustainable plastics
- expand the range of plastics being recycled

These plants will increase the available recycling capacity in the UK reducing the amount being sent to landfills or incineration or exported overseas for disposal.

#### ReNew ELP

ReNew ELP proposes to set up a plant centered on a catalytic hydrothermal reactor (Cat-HTR™) at Wilton, Teesside. Once up and running, the plant would convert 20,000 tonnes per annum (tpa) (increasing to 80,000tpa on site completion) of end-of-life plastic into chemicals and oils for use in the production of new virgin grade plastics including naphtha, waxes, and a bitumen-like residue suitable for use in road construction.

Recycling Technologies has been awarded funding for a chemical recycling plant that uses thermal cracking to recycle a wide range of plastic waste that cannot be recycled by conventional methods.

The plant is designed to process 7,000tpa of hard-to-recycle mixed plastic waste, producing 5,200tpa of a hydrocarbon oil which can replace crude oil in plastics production – allowing plastic to be recycled an unlimited number of times.

It will be based in Perth, Scotland.

With partners, Neste Corporation and Unilever, this project combines the expertise of these three global leaders in their respective business areas to develop chemical recycling and make hard-to-recycle plastic packaging, such as films, sachets and pouches, recyclable.

Poseidon Plastics aims to commercialise its novel enhanced recycling technology through the construction of a 10,000 tons per annum polyethylene terephthalate (PET) recycling facility.

Partnering with waste collection and mechanical recycling experts Biffa and PET resin producers Alpek Polyester UK and DuPont Teijin Films UK, this project aims to demonstrate how post-consumer and post-industrial packaging, film and other hard-to recycle PET wastes can be chemically recycled back into new consumer end-use goods.

Through collaboration with the Green Chemistry Centre of Excellence at the University of York and polyester fibre users O'Neills Irish International Sports Company and GRN Sportswear (Presca), the consortium further aims to demonstrate and optimise a closed-loop, circular economy for all polyester materials.

Veolia in collaboration with Unilever, Charpak Ltd and HSSMI will develop the UK's first dual PET bottle and tray recycling facility (supported by a digital twin created by HSSMI), capable of recycling 100% of clear rigid PET in a closed-loop system. Unilever will investigate the non-food contact recycled PET produced from this facility in its home and personal care range, so avoiding the use of food contact grade material in these non-food products. Charpak Ltd will use the flakes produced in its trays, making tray to tray recycling a reality. This will create a new, complementary non-food closed loop for recycled PET and widen availability of the material for use in bottles and trays.

Through the development and use of the digital twin, HSSMI will pioneer a virtual engineering approach in the waste industry, which will help optimise the facility and identify potential commercial challenges. If initial trials are successful, the proposed facility would process 35,000tpa of mixed PET packaging waste at an existing Veolia site.

*(Source: UK Industrial Strategy Challenge Fund)*

#### Box 6. Funded projects - ReNew ELP

- **Establish / strengthen laboratory capacity** - Some companies reported a shortage of laboratories and quality tests of recycled raw material in Israel. To check the quality of recycled materials, Israeli companies are required to send their materials for tests abroad. The companies state that the issue constitutes a barrier to the creation of standardization in the recycled material market in Israel. It is recommended to strengthen the plastic institute - the only applied plastic R&D institute in Israel. In addition, there is difficulty in incorporating recycled material into production lines due to the inability to obtain laboratory approval for its quality, durability, and repeatability. The recommendation is therefore to create a grant program for laboratories to invest in equipment and capacity to test recycled plastic qualities (migration, compliance with international standards such as REACH, etc.) as well as to test recycling/washing processes to verify compliance with international protocols.



- **Create solutions for Flexible packaging** - Due to Tmir's technological limitations and flexible packaging's lightweight, their sorting is technically difficult without expensive equipment and they are currently not sorted in Israel. This is lamentable as this constitutes a significant stream in the packaging domain (in the US, flexible packaging is the second-largest segment, responsible for 19% of market earnings[13]). Solutions can be in the form of high end sorting equipment such as MRFF project or in a new logistical solution based on separating flexibles at the source (an example is the source separated hefty energy bag program).
- **Training** - Training of workers for production from recycled raw material (practical engineers, engineers, production floor team) and training of the recycling industry is lacking. We recommend holding specific training sessions for the plastic industry to facilitate the use of PCR on production lines.

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[13] <https://www.flexpack.org/facts-and-figures>

## 5. Adapting landfilling and incineration policies

Landfilling fees in Israel are lower than the average in OECD as seen in the following chart:

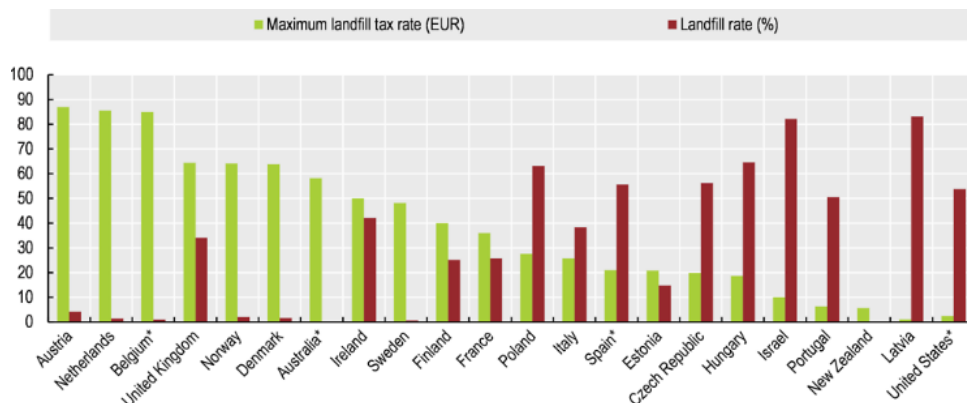


Figure 7: Municipal waste landfilling and tax rates, 2013  
(Source: OECD, 2019)

Landfill taxes in most OECD countries have increased, sometimes significantly, over the past five years (OECD, 2020).

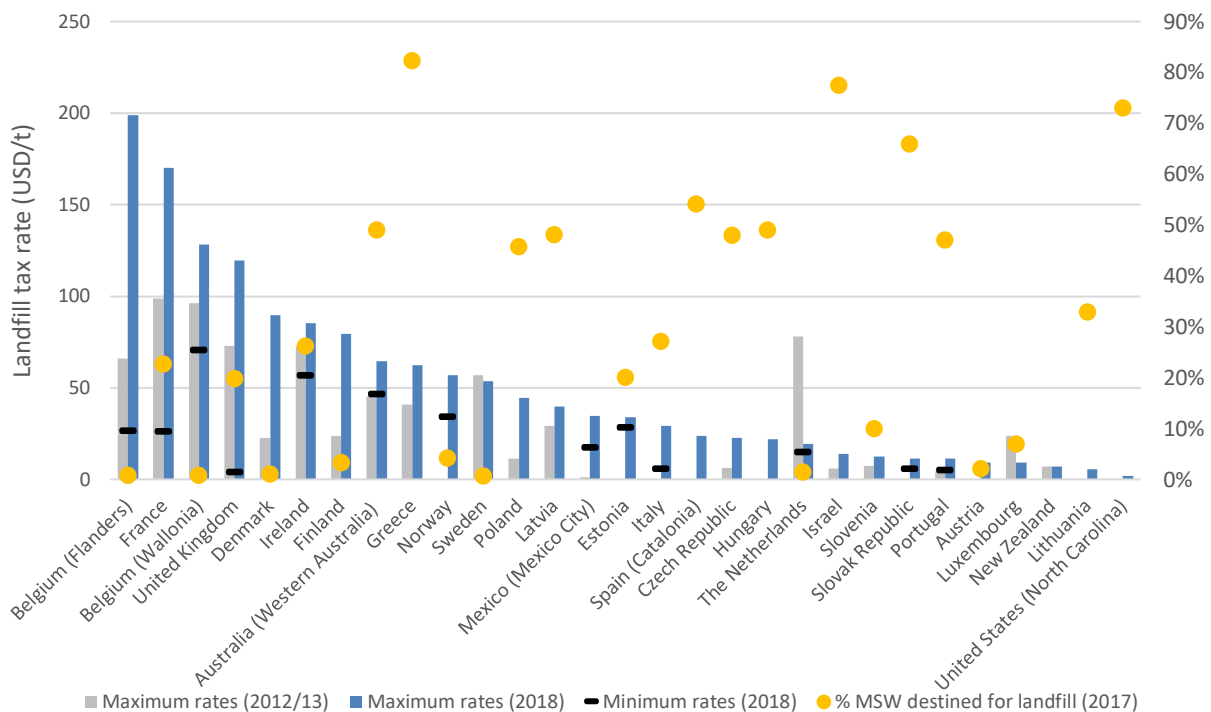


Figure 8: Landfill tax rates of MSW in OECD countries in 2018 and 2013  
(Source: OECD, 2020)

This, of course, has a negative effect on the economics of recycling: since if it is cheaper to landfill - recyclers cannot compete. Recent data suggested a figure of 73 ILS /ton landfilling

costs, and 84 ILS/ton handling at Tmir (Dr. Or Karassin, research results presented at conference of the Israeli Association for Ecology and the Environment, July 2021).

Incineration has zero fees in Israel, as opposed to other OECD countries, and this has the same impact. Waste incineration with energy recovery is usually environmentally preferable to landfilling, and incineration taxes tend to be lower than landfill taxes to provide a coherent incentive structure. For instance, the Italian waste law (549/95) defines that incineration tax without energy recovery should amount to 20% of the landfill tax in each region (OECD, 2020). To increase recycling, incineration should be disincentivized, and new facilities should not be built. This is also true if the country wants to encourage a circular economy.

#### Incineration tax

The Netherlands has the highest current MSW incineration tax with 13 EUR/t. Catalonia's tax design stands out, as generated tax revenues are earmarked for a Waste Management Fund. About 50% of the fund is destined for biological treatment of biowaste, aiming to reduce organic content of residual waste. The remaining revenue is refunded to the local authorities according to their performance regarding separate collection and recycling of biowaste, providing an incentive to local authorities to increase material recovery.

The Danish incineration tax was converted in 2010 from a weight-based tax to one based on energy and CO<sub>2</sub> content. The new system aims to provide a stronger incentive to recycle the most energy intensive waste, such as plastics. The tax is a combined input-output tax, charged at DKK 26.5 (EUR 3.56) per GJ according to the energy content in the input waste and DKK 19.8 (EUR 2.66) per GJ for heat output. Additional emission taxes for CO<sub>2</sub>, NO<sub>x</sub> and sulphur emissions also apply.

Country	Incineration tax rate	Year of introduction	Comment
Austria	8 EUR/t	2006	
Belgium (Flanders)	8.18 EUR/t general waste, 2.34 EUR/t for recycling residues	2006	
Belgium (Wallonia)	11.3 EUR/t	2016	
Denmark	Combined input-output tax: 26.5 DKK (EUR 3.56)/GJ according to energy content of input waste, 19.8 DKK (2.66 EUR)/GJ for heat output Additional emission taxes apply: 173.2 DKK (23.2 EUR)/t of CO <sub>2</sub> and 5.10 DKK (0.68 EUR)/t NO <sub>x</sub> emissions	2010	The incineration tax was converted in 2009 from a weight-based tax to one based on energy and CO <sub>2</sub> content. The new system aims at providing a stronger incentive to recycle the most energy-intensive waste, such as plastics.
Italy	1.03 - 5.16 EUR/t for inert waste incineration without energy recovery. The interval is set in the National Law 549/95, while the rates are decided every year by each region e.g. 5 EUR/t in Campania, 2-3 EUR/t in Lombardy, 3 EUR/t in Lazio	1995, revised in 2015	
The Netherlands	13 EUR/t	2016	
Portugal	1.45 EUR/t for recyclable MSW, 1.14 for other wastes		
Spain (Catalonia)	7.4 EUR/t for MSW post-sorting, 18.6 EUR/t for non-separated and sorted MSW	2009	
United States (Indiana)	0.5 USD/t (0.45 EUR/t) solid waste destined for landfill or incineration		

Sweden	487 SEK/t (ca. 45 EUR/t) with reductions for electricity producing incineration plants	introduced 2006	Incineration tax suspended in 2010 as it has not stimulated recycling.
Norway	90 NOK/t (ca. 8 EUR/t)		Incineration tax suspended in 2010.

(Source: OECD, 2020 (Note: the data for the Netherlands is inaccurate, and it is currently 32 Euro/t. We are unsure of the accuracy of the rest of the data)

Box 7. Incineration tax

An alternative to raising landfilling / incineration fees, is to ban landfilling if certain types of waste, such as plastic. This will also generate an economic incentive to increase recycling rates.

## 6. Setting recycling goals (that would entail also addressing flexible packaging)

In Israel, the recycling goal for plastic packaging waste stands at 50% by 2025 and at 55% by 2030, similar to the EU goal. To reach the higher recycling targets, the EU also aims to boost the uptake of recycled plastics by the plastic converting industry in the production of new products. By 2022 at the latest, it is expected that the European Commission will introduce minimum quotas for the usage of recycled content in new plastic products, with which plastic converters and brand owners will have to comply. Although these quotas are currently being developed, industry experts expect them to range between 15% and 30% (Ibid).

In 2020 a new calculation method was introduced resulting in the average recycling rate being 29% instead of 42% in 2018. This means that all member states have an even larger gap to close.

Plastic packaging waste recycling rate, 2018  
(current versus new calculation method)<sup>(6)</sup>

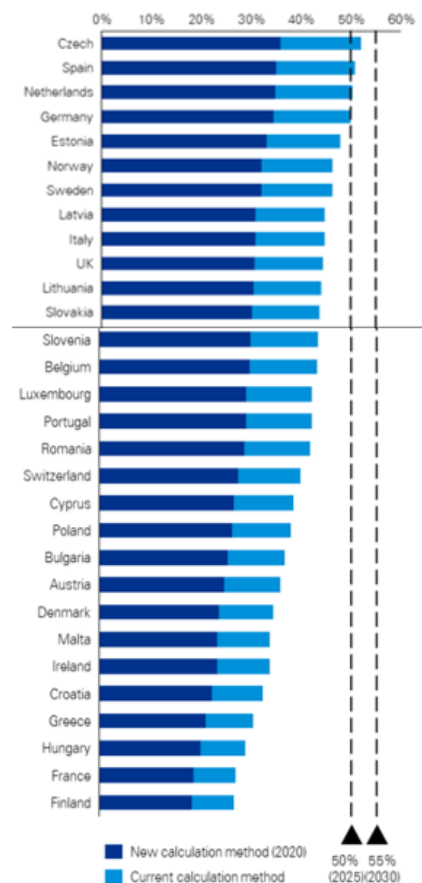
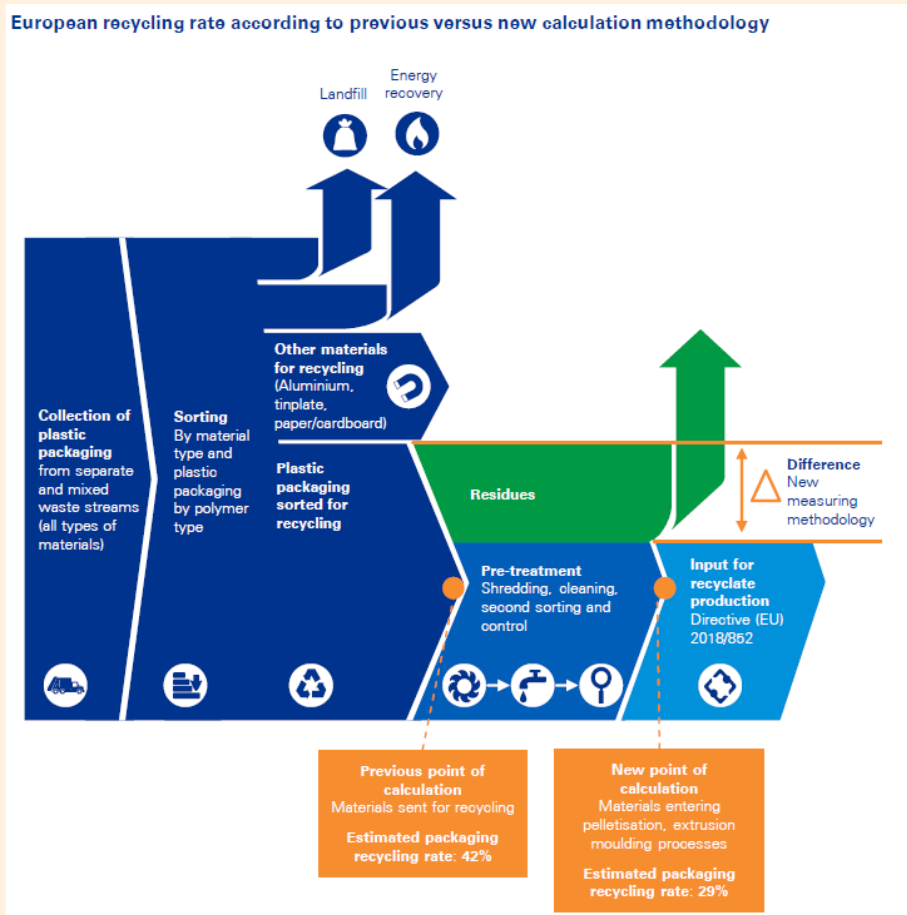


Figure 9: Plastic packaging waste recycling rate, 2018  
(Source: KPMG, 2021)

### Recycling rates

Until 2019, the recycling rate was based on the volume sent to recycling facilities. The recycling process consists of two phases: pre-treatment in which residues are filtered out through shredding, washing and further sorting operations, and the pelletisation (extrusion) phase in which plastic flakes are melted into new plastic granules. Effective 2020, the recycling rate will be measured based on the volume that enters the pelletisation (extrusion) phase of the process, instead of on the volume that is sent to recyclers. By shifting the point of measurement the regulator has created an incentive to increase the recycling yield by limiting contamination and therefore loss during the pre-treatment phase. Based on this method, the European recycling rate was only 29% in 2018.



(Source:  
2021)

KPMG,

### Box 8. Recycling rates

It is important to note, that waste reduction goals are not necessarily "recycling goals". In OECD (2020), table 4.3 (attached below) shows that waste targets can be set in the various life cycle stages (waste generation, waste reduction, collection, recycling).



Country	National target	year
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#### *Examples of waste generation caps*

Belgium-Flanders	Residual waste: the targets range from 116 kg/person/year for suburbs to 258 kg/person/year for coastal municipalities. Overall for Flanders an average of 140 kg/person/year should be reached, taking into account that this no longer covers just household waste fractions but all mixed municipal waste as defined in the new EU Waste Framework Directive.	2020
Hungary	Generation of solid municipal waste to be less than 70 kg/person.	2020
Netherlands	The annual volume of household residual waste to be a maximum of 100 [30] kg/person.	2020 & [2025]

#### *Examples of waste reduction targets*

UK-Scotland	No more than 5 per cent of all waste to go to landfill.	2025
Netherlands	Halve (compared to 2012) volume of residual waste from companies, organisations and government	2022
Japan	Reduce disposable plastic waste by 25%	2030
Australia	National Food Waste Strategy: Halving Australia's food waste by 2030	2030

#### *Examples of collection targets*

Croatia	Separately collect 75 per cent of the mass of construction waste.	2022
Germany	A 50 per cent increase in the quantity of separately collected organic waste and high-quality recycling/recovery of such waste by 2020 relative to 2010.	2020

#### *Examples of recycling targets*

China	35% of urban household waste to be recycled	2020
Denmark	Recycling of organic waste, paper, cardboard, glass, wood, plastic and metal waste from households, including packaging: the target is to reach 50 per cent by 2022.	2022
France	60 per cent of materials purchased by national and local authorities for road construction to be reused or recycled building waste.	2020
Japan	Increase recycled and reused plastic of household and industrial waste to 60%	2030
Slovakia	The objective for recycling metal packaging waste is 55 per cent and for wood-based packaging waste 25 per cent.	2020

(Source: OECD, 2020)

## 7. Other policy mechanisms

Israel has several EPR systems covering e-waste, packaging, and plastic bottles. An extension of the system can include other types of plastic waste such as single use plastics, agricultural plastics and even construction plastic and consumer products. In such an extension is worthwhile to include the following elements:

### 7.1 Eco modulation of EPR fees for packaging

- There are initial indications that the next PRO to be selected in December 2021 will indeed operate on a modulated fee structure based on packaging recyclability. Modulation can also be based on numerous other criteria, see table below.

Country	EPR policy description
Design for recycling; sortability and recyclability	
Belgium	Mono-material packaging almost twice as high as mixed-material packaging (EUR 408/t, vs. EUR 259/t).
France	50% fee increase mixed-material 100% for non-recyclable material. 8% bonus by replacing both with mono-material substitutes.
Italy	Plastic packaging is split into three bands based on recyclability criteria (179-228EUR/t).
Reparability	
France	20% fee increase for unavailability of spare parts (refrigerator, vacuum cleaners, drills). Reversely, 20% fee decrease for ensuring availability of spare parts for 5-11 years (depending on product group).
Recycled content	
France	10% fee reduction for cardboard/paper with >50% recycled content; 50% fee reduction for textiles and shoes with 15% recycled fibres.
Canada	Quebec: 20% bonus for producers using recycled content in containers and packaging and for printer materials.
Consumer awareness and prevention	
France	8% discount for producers that organize prevention and consumer awareness campaigns and/or develop reusable packaging.

(Source: OECD, 2020)

For more on the topic of eco modulation in EPR see OECD "Modulated fees for Extended Producer Responsibility schemes (EPR): a scoping note", ENV/EPOC/WPRPW(2020)2, and

Eunomia report "Study to Support Preparation of the Commission's Guidance for Extended Producer Responsibility Schemes ", 2020.

Some EPRs finance innovative solutions for the collection, reuse, and recycling, by a bonus/malus system whereby companies can receive a bonus for products and services which are more circular, while companies with linear products and services pay a levy. The manufacturers themselves can evaluate the performance of their products or an NGO authorized by the government. The MoEP or Tmir can conduct random audits.

## 7.2 Deposit system for plastic agricultural films

As an alternative to an EPR, plastic agricultural films can be managed through a deposit system (expand the bottle deposit law to also cover agricultural films).

- Reviewing competition policy (anti-trust) to foster collaboration
  - Allow several factories to procure jointly for recycled PCR or to jointly define the technical specification for PCR, to create economies of scale and reduce prices. Due to the inherent difficulties in the recycling sector in Israel (not only plastic), it is worthwhile considering alleviating anti-trust rules to allow economies of scale also in the procurement of waste material for recycling, logistic services' water, energy, machinery. the recommendation to create size advantage is to be found also in Europe, see for example KPMG report 'The Plastic Recycling opportunity', from October 2019.
  - One potential model is SRN in the Netherlands, which is a scheme that gives access to feedstock at competitive prices for all those that participate in the scheme.
- Many recycling plants or factories that want to do recycling are limited due to zoning laws that forbid them to expand the area of the factory to establish recycling facilities (for example in an area that is designated as warehouses or agriculture). Easing zoning laws for these kinds of activities could be an incentive for factories to consider expanding into recycling.
- Re-evaluate code classification for plastic sector operators, particularly recyclers. Classification as "industry" or as "waste treatment facilities" can significantly impact opportunities to receive government grants.
- Policy signals should aim for the following goals:
  - Create safety for the industry to invest in recycling infrastructure:
  - Support and expand (separate) waste collection efforts.
  - Improve recycling behavior, including nationwide, sustained consumer education programs.
  - Improve sorting capability at the MRF, especially in Israel where most of the household plastic ends up in the mixed waste stream (the MoEP has indeed published a call to support projects of this type).

## 7.3 Information systems, databases, digital data, use of data

- Eco design - Israel could adopt elements from the compulsory eco-design directive, which next cycle is also going to address design for circularity.
- Guidance should be given on design for recyclability/circularity, as in the example of the UNIDO led sustainable packaging design tool (D.A5). The development of such design tools can increase recyclability and increase the value of the material once recycled.

## 7.4 Green public procurement (GPP)

GPP had been covered in a bespoke deliverable (D.A9). however, it should be mentioned here as well as it is a potentially key driver in promoting the use of recycled base products, and products designed for recyclability. GPP can address products (set specific criteria for products such as recycled content, reparability or recyclability), suppliers (requiring supplier take-back systems or demanding external or internal reuse of the products) or the overall system (e.g. through a shift from a product-purchasing model to a product-service-system (PSS) or leasing contracts).

## 7.5 Enforcing an increase in demand through regulation

A major effort must take place to build confidence in the use of recycled plastics. KPMG (2021) explain that the quality of recycled plastic needs to increase as many recycling companies experience a vicious circle of limited quality output, leading to correspondingly low prices for recycled plastic, leading to low profitability, in turn limiting the ability to invest heavily in quality, keeping quality and demand low. A way to break through this vicious circle, and make sure that major investments in quality will be earned back, is by enforcing an increase in demand through regulations.

As can be seen from the below chart, confidence must increase in all plastic use-cases.

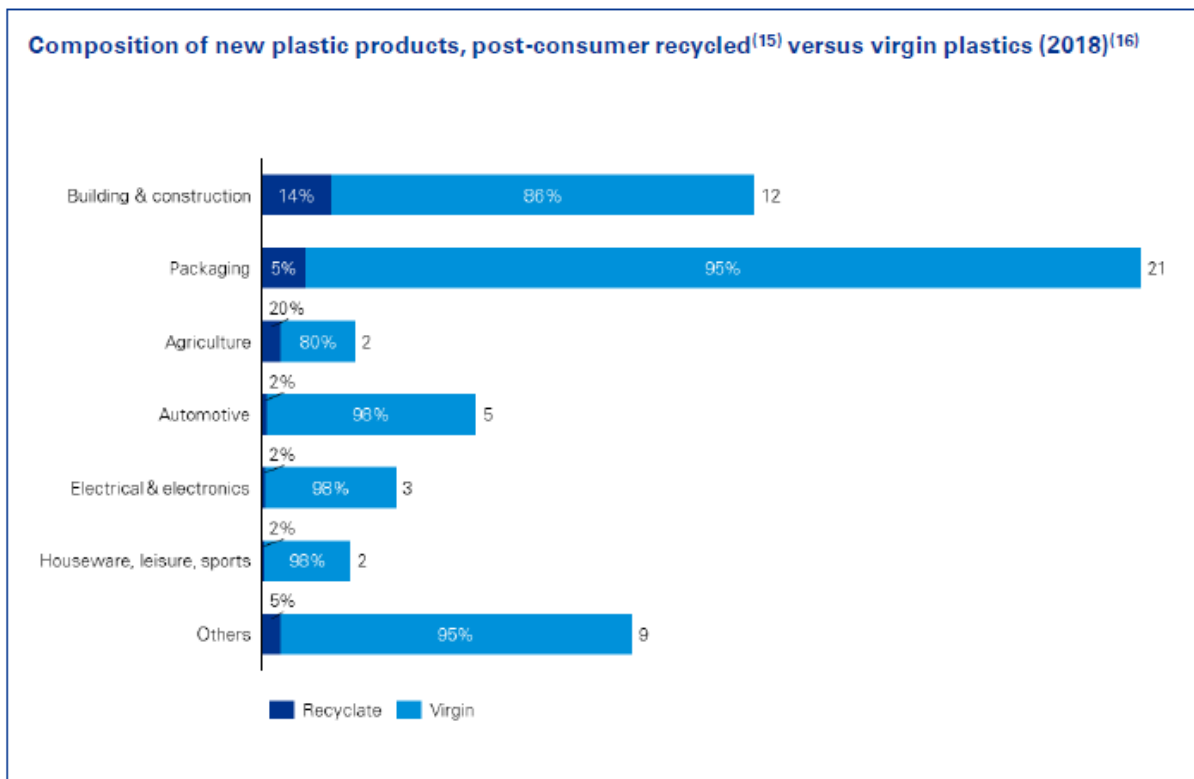


Figure 10: Composition of new plastic products, post-consumer recycled versus virgin plastics, 2018

(Source: KPMG, 2021)

As mentioned before, the Circular Economy Action Plan, part of the European Green Deal, indicates the introduction of legislation around the use of a minimum share of recycled content in new plastic products by 2022 at the latest. This is expected to apply to all plastic products except food packaging (due to food safety regulations) and PET (which already has a mandatory recycled content quota of 25%).

This is a serious export consideration for Israeli plastic manufacturers. Brands can expect to have to revise their design and material selection and plastic converters will have to adapt and be able to accept PCR. We see that major plastic producers such as Borealis and LyondellBassell are already anticipating this transition and acquired plastic recycling companies to be able to provide customer demand.

- **Data generation** - an infrastructure for information and data collection about plastic flow across the market, created in collaboration of academic and government support can be useful to establish the areas of focus.
- **Creating a hierarchy of recycling options** - it is yet unclear whether flexible packaging which cannot be recycled in Israel is worse than a rigid package which can be recycled but is much heavier and has higher volume and this creates transportation emissions. It is also unclear whether chemical recycling is environmentally beneficial in Israel. Industry can create LCAs, but it is advantageous to create a single use, verifiable LCI (Life Cycle Inventory) that will be used as the basis for all the LCAs so that they can be more comparable and have the same benchmark. The creation of such an LCI is not an easy task and should be supported by allocated funding. An LCA based recycling hierarchy can then be used also for determining the fee in the various (eco-modulated) EPR schemes.
- **Industry stakeholders** - should be encouraged to collaborate (without breaching anti-trust rules) and share information with groups both in Israel and abroad. Participation of Israeli industry in coalitions such as the [Australian Packaging Covenant Organisation](#), the [polyolefin circular economy platform](#), and others, as well as encouraging Israeli companies to sign the [circular plastic alliance](#), [would infuse local stakeholders with direct access and information on recent developments worldwide](#).

In the OECD report (OECD, 2020) "progress report on the implementation of the Recommendation of the Council on Resource Productivity" they refer to OECD recommendation to "encourage co-operation and sharing of best practices among enterprises" and explain that "Platforms for information exchange that facilitate discussion on good practice among different stakeholders (e.g. businesses, cities, and circular economy experts) can enable better diffusion of best-practices and their subsequent adoption. With the increasing political attention on resource efficiency and the circular economy, a variety of multi-stakeholder platforms for information exchange have been established in recent years (Box 9)."

*Selected examples of multi-stakeholder platforms for information campaigns that emerged in recent years*

*The World Circular Economy Forum (WCEF)*, established 2017, is a global initiative of Finland and the Finnish Innovation Fund Sitra. The WCEF brings together business leaders, policymakers and experts to discuss how businesses can seize new opportunities and gain a competitive advantage through circular economy solutions, as well as how the circular economy contributes to achieving the UN Sustainable Development Goals (SDGs). The third WCEF was held in Helsinki, Finland in June 2019 and the fourth edition will be hosted by Canada in 2020.

*European Circular Economy Stakeholder Platform (ECESP)*, established in 2017, founded by the European Economic and Social Committee, ECESP provides a meeting place for stakeholders to share and scale up effective solutions and address specific challenges and bridges existing initiatives at local, regional and national level, supporting the implementation of the circular economy (European Commission, 2019<sup>[41]</sup>).

*CircE Project*, established in 2015, brings together 8 partners at regional and local level and representatives of different European social and economic scenarios. The project aims at strengthening the diffusion of Circular Economy in Europe, primarily through an exchange of knowledge and experiences among Partners (Interreg Europe, 2018<sup>[42]</sup>).

*The No Agricultural Waste (NoAW) project*, established in 2016, is an EU Horizon 2020 project focussing on innovative approaches to turn agricultural waste into ecological and economic assets. The NoAW Knowledge Exchange Stakeholder Platform, enables information exchange and discussion among agro-food businesses, farmers, biogas processors, food companies, scientific community and the authorities (NoAW, 2018<sup>[43]</sup>).

*The Circular Economy Platform of the Americas*, established in 2016, is an initiative powered by the Americas Sustainable Development Foundation (ASDF). The platform gives access to information about Circular Economy from and for the Americas, and brings together individuals, businesses, governments, academia and organisations willing to engage in promoting, facilitating and help realising Circular Economy adoption and implementation in the Americas (CEP, 2018<sup>[44]</sup>).

*Circular Economy Alliance Australia (CEAA)*, brings together experts and leaders from government, industry, university, consulting and training organizations from around the world on a common platform to enable collaboration, knowledge sharing, networking and wider adoption of Circular Economy (CEAA, 2018<sup>[45]</sup>). Finally, the EU Platform on Food Losses and Food Waste (FLW), established in 2016, brings together EU institutions, experts from the EU countries and relevant stakeholders. The Platform aims to support all actors in defining measures needed to prevent food waste, sharing best practice, and evaluating progress made over time (European Commission, 2018<sup>[46]</sup>).

*(Source: OECD, 2020)*

**Box 9. Selected examples of multi-stakeholder platforms for information campaigns that emerged in recent years**

- **Voluntary agreements and pacts** - These are valuable tools to help the industry take the steps into the circular plastic market, as evident in the EU Strategy for Plastics in a Circular Economy which calls for such actions to increase the use of recycled plastics, aimed at driving market development (European Commission, 2018).

*A good model for industrial set up of local stakeholders is the [European Plastics pact](#) and the [UK plastics pact](#)*

The UK Plastics Pact brings together businesses from across the entire plastics value chain with UK governments and NGOs to tackle the scourge of plastic waste. We are creating a circular economy for plastics, capturing their value by keeping them in the economy and out of the natural environment.

Pact members will **eliminate problematic plastics** reducing the total amount of packaging on supermarket shelves, **stimulate innovation and new business models** and **help build a stronger recycling system in the**



**UK.** Together we will ensure that plastic packaging is **designed so it can be easily recycled** and made into new products and packaging and, with the **support of governments**, ensure **consistent UK recycling** is met.

The UK Plastics Pact, led by WRAP, is the first of a global network of Pacts, enabled by the [Ellen MacArthur Foundation's New Plastics Economy](#) initiative.

We're united behind four targets to 2025.

1. Eliminate problematic or unnecessary single-use packaging through redesign, innovation or alternative (reuse) delivery model.
2. 100% of plastics packaging to be reusable, recyclable or compostable.
3. 70% of plastics packaging effectively recycled or composted.
4. 30% average recycled content across all plastic packaging.

*(Source: UK plastics pact)*

Box 10. A good model for industrial set up of local stakeholders is the European Plastics pact and the UK plastics pact

Another good model is The Canadian plastic pact - <https://plasticspact.ca>

#### The Canadian plastic pact

The CPP unites [Partners](#) behind a vision of a circular economy for plastic in which plastics stay in the economy and out of the environment.

The Canada Plastics Pact is proud to bring together businesses, policymakers, associations and NGOs, behind a shared vision of a circular economy for plastic, in which plastics stay in the economy and out of the environment.

The CPP has adopted the [Ellen MacArthur Foundation's vision](#) of a circular economy for plastic, in which it never becomes waste or pollution. It is working towards the following targets, which have been adapted for Canada's local context:

- Define a list of plastic packaging that is to be designated as problematic or unnecessary and take measures to eliminate them;
- Support efforts towards 100% of plastic packaging being designed to be reusable, recyclable or compostable
- Undertake ambitious actions to ensure that at least 50% of plastic packaging is effectively recycled or composted; and
- Ensure an average of at least 30% recycled content across all plastic packaging (by weight).

As its first step, the CPP will develop a roadmap to lay out the direction, strategies, and tactics for taking action to 2025. This work began in earnest upon the launch of the CPP in January 2021.

*(Source: <https://plasticspact.ca>)*

Box 11. The Canadian plastic pact

- **Support creating a digital marketplace for recycled raw materials** - Such as <https://www.atomler.com>
- **Create quality assurance labs** - Recycled plastics need to be seen as a resource with material properties equivalent to virgin plastics by ensuring it has the required functionality, and to facilitate standardization. An example of a quality assurance lab is the Swedish Polykemi lab.
- **Encourage chemical recycling** - Plastics that are difficult to recycle mechanically can increasingly be recycled chemically, with the alternative often being energy recovery. Many chemical recycling solutions haven't yet been proven to be environmentally superior to alternatives (IVA, 2020, Resource-effective and circular plastics flows - The role of Plastic in a circular society) as they are often energy-intensive due to the high temperatures required. Plastic manufacturers such as Bazan have a clear role to play in establishing goals and standards for chemically recycled raw materials since, without them, it will be difficult to create demand for the products of this technology.
- **Establish a definitive baseline of performance** - As we cannot manage what we cannot measure any research or policy effort needs clear data to design effective strategies and relevant solutions. This should be a national data collection effort. An example of the benefits of such an effort is quantifying the amount of infrastructure investment needed to modernize material recovery.
- **Coordination** - The recycling landscape in Israel, as in many countries is a patchwork of numerous stakeholders. This requires coordination and leadership, so that the most effective opportunities for investment, improvement and innovation can be identified. It is recommended to establish a coalition of all relevant stakeholders, that will include besides recycling facilities, also raw materials manufacturers and importers, sorters, retailers, brands, converters, and of course government.
- One initial and immediate goal for this coalition would be to establish a coordinated national direction and standards.
- The whitepaper on the national plan for CE in the industry from April 2019 (Industrialists Association) recommended establishing a knowledge hub that will collect data, professional know-how from all over the world, information about technologies and processes adopted globally, information about designers and consultants, global regulation and will facilitate conducting of LCAs using a central national database.

2017 OECD questionnaire on “Policy Instruments for Sustainable Materials Management, Resource Efficiency, and the Circular Economy” resulted in the following policy mechanisms that could be relevant also in the case of plastic in Israel.

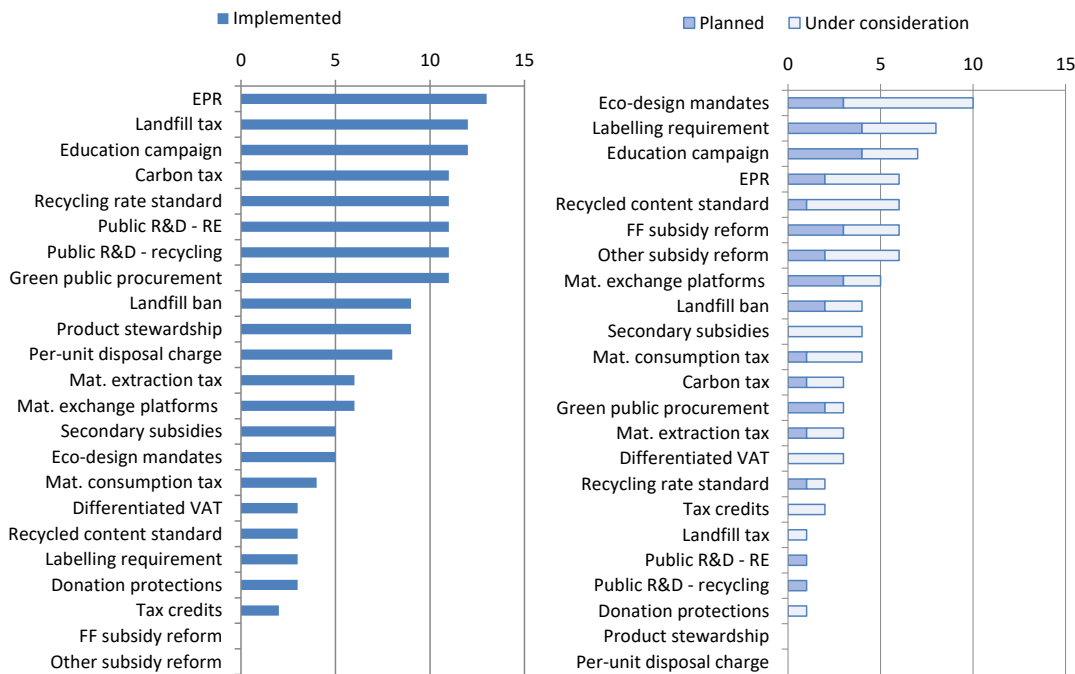


Figure 11: Policy Instruments for Sustainable Materials Management, Resource Efficiency, and the Circular Economy, 2017

(Source: OECD, 2020)

From OECD (2020) report it is also obvious that most implemented policies focus on the end-of-life and manufacturing parts of the value chain (e.g. eco-design mandates and recycled content standards). However, many planned and considered policies target manufacturing and consumption phases (e.g. education and labeling requirements).<sup>[14]</sup>

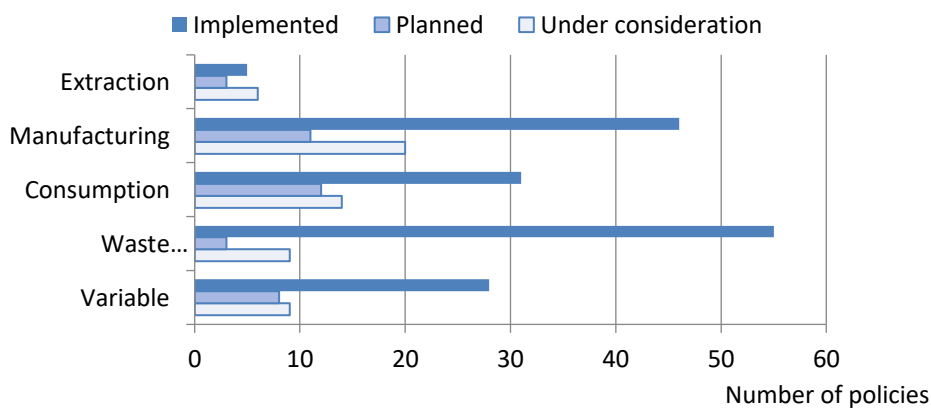


Figure 12: Questionnaire results: SMM, RE, and CE policies by supply chain incidence

(Source: OECD, 2020)

[14] Generally, few of the countries that responded to the questionnaire enacted policies that target the upstream extraction phase of value chains. This is probably partially due to the characteristics of the responding countries as most do not have significant extractive sectors, but it may also reflect concerns about domestic competitiveness.

### Recycle Now

[Recycle Now](#)<sup>TM</sup> is the UK national recycling campaign for England and Northern Ireland, which aims to motivate more people, to recycle more of the right things, more often.

We work with and alongside brands, retailers, waste management companies, local authorities and Government to bring about real sustainable change.

Recycle Now works at the forefront of consumer insights on recycling behaviors. This allows us to run direct-to-citizen campaigns, work with key partners, provide tools and develop behavior change interventions to enable citizens to recycle more effectively.

Through the delivery of key campaign moments, ongoing citizen interaction, partnerships and Recycle Week, the annual recycling awareness week, Recycle Now works to educate and inspire citizens to modify their behavior in recycling.

[Clear on Plastics](#)<sup>TM</sup> is a campaign brought to you by WRAP, and supported by [The UK Plastics Pact](#). It exists to cut through the confusion and give citizens clear, evidence-based information on plastics and sustainability, allowing them to make their own informed choices.

Our aim is to give people clear information about the complex world of plastics, waste and recycling – for instance, explaining the role of plastics, and demonstrating the balance between the benefits and drawbacks of alternatives.

The campaign aims to make citizens feel more well-informed about plastics to make their own, sustainable choices; with content based on the latest citizen conversations, online and in the media, in order to achieve reach and impact.

Clear on Plastics is a social media led campaign amplified by influencer content and the support of UK Plastics Pact members, Pact supporters and other partners such as Local Authorities.

(Source: <https://wrap.org.uk/taking-action/plastic-packaging>)

### Box 12. Recycle Now

## 8. Raising consumer awareness and affecting consumer behavior

Recycling success requires packages that are designed and labeled for recyclability, a policy that supports recycling, access to reliable, convenient, equitable collection, and resources to support education and outreach. Previous episodic events in Israel have generated a distrust among the public to source separation and this is a barrier that should be carefully handled.

EC (2021) had summarized some incentives that empower consumers to select more circular products: "Stimulate the availability of reliable (LCA, etc.) environmental information on products for buyers (citizens and Public Authorities), e.g., through labeling (ecolabeling for truly sustainable product and services, certification on a voluntary or mandatory basis), lower VAT or local subsidies on circular products and information campaigns to raise public awareness about environmental and social benefits of circular products and services to empower citizens in making sustainable choices.

Consumer behavior-individualism, convenience combined with overconsumption are key behavioral barriers towards less use, more reuse and the ability to recycle.

- **Create demand and incentive to use PCR in products** - In discussion with Israeli industry, one idea that was suggested was the establishment of a verified label on products containing PCR or that are recyclable, that would award market advantage to products holding it, and thus create an incentive to develop such solutions. It is worth mentioning that there are many aspects an eco-label can cover and PCR is not necessarily the most important, hence this should probably be integrated in a larger scheme for an eco-label in the Israeli market.
- **A wealth of resources on influencing consumer behaviour exists at the WRAP info hub** - The two ongoing campaigns in the UK are Recycle Now™ and Clear on Plastics™.
- **Increase educational efforts on the importance of reducing, reusing and recycling.**

## 9. Agricultural plastics waste

Plastic waste in the agricultural sector constitutes approximately about 40,000 thousand tons a year. The most popular products are films, ground coverings, pipes, and bags. MoEP is currently working on a modification to the law, that would require the farmer to separate the plastic waste and transfer it for treatment within a limited period of time along with keeping the registration references for inspection. they too, however, would allow landfilling as an acceptable end of life solution. Whole pipes and drip lines are often collected and recycled, films are more often than not either illegally incinerated or landfilled. In order to encourage recycling of those films, it is recommended to establish national collection schemes as an industry led initiatives between farmers, distributors, and converters, in a B2B relationship.

Create specific legislation for the end-of-life management of non-packaging agricultural plastics so that it doesn't fall under general waste legislation. Such bespoke legislation can for example be a deposit law on plastic film or an EPR system for that material.

### Agricultural plastic EPR schemes

Four existing agricultural plastic EPR schemes (France, Germany, Ireland, and Sweden), and one recently discontinued scheme (Andalusia), were reviewed. There is some variance between the schemes in terms of who fees are charged to and at what point they are collected. However, the way in which fees are set is relatively consistent. The majority of schemes set fees according to the end of life cost, in places referred to as the reverse value chain. This recognizes that different agricultural plastics and applications incur different end of life costs owing to demand for secondary material, extent and likelihood of contamination, and their capacity to be recycled. In some schemes, this is a simple classification into groups – for example in Ireland fees are split into two categories. In other schemes, a more granular classification is used – for example in France, fees are set for ten different product types.

At present, it seems as though EPR schemes for agricultural plastic are not utilizing fees to specifically incentivize use of certain materials or dissuade the use of others. The focus has been on ensuring that the varying end of life costs are covered. There is, however, potential to modulate fees in future. Modulation of fees by inclusion of recycled content was discussed with some interest from schemes. Such a measure could help to increase demand for secondary content within agricultural plastics, and improve the economies of recycling for these materials as a whole. This could be of particular benefit to the sector, with many of the schemes reporting difficulties in finding reprocessing capacity for their films following the Chinese import restrictions. In line with the principle outlined in Section 5.3, it would be important to consider whether other policy measures might be more suited to achieve this objective.

The use, and modulation of fees for biodegradable plastics was also discussed. Many of the schemes reflected that due to the nature of use of agricultural plastics in their country, there was little demand for biodegradable plastics and it was not something they were considering – this was the case in Sweden and Ireland. In France however, biodegradable mulch films are used and these are not subject to the eco-contribution. As such, an incentive exists for farmers to use these products. In addition, as they are not removed from the soil post-use, there is no collection fee to be paid and with the increased fee for mulch plastics in the scheme (as a result of Chinese restrictions) the relative financial benefit of using biodegradable mulches has increased. Resultantly, France has seen a 30% increase in demand for biodegradable mulch films in 2019.

Full details are provided in Appendix A.4.0

(Source: Eunomia, 2020)

### Box 13. Agricultural plastic EPR schemes



# Annex 1 - D.B.6: Barriers to plastic recycling and use of recycled plastic in Israel

Summary of the barriers to plastic recycling and use of recycled plastic in Israel that is included in submission D.B6 Closing circles in the plastic chain in Israel:

## **Regulation and policy**

- Regulation absence for eco-design
- Barriers to approve license of a recycling business
- Low landfilling fees are a low incentive for recycling
- The packaging law and the orange bin solving a restricted part of the plastic waste stream (deployment in authorities, public response...)
- Lack of modulation fees of handling packaging waste according to their level of eco-design in Tmir (eco-modulation)
- No incentives to use PCR plastic versus the use of virgin plastic
- The trend of the legislature regarding using PCR is unclear (a reference to Europe)
- A wide range of regulatory agencies that manage the field of recycling (Ministry of Economy, Ministry of Environmental Protection and Ministry of Agriculture)
- Tough terms to receive grants for the recycling industry (export obligation, definition as service providers and not as a manufacturing industry)
- Lack of preferences of using PCR plastic in public procurement

## **Standardization**

- No standardization of PCR materials and using PCR in production
- Approval to use multilayer (ABA)
- Approval to use PCR in construction and infrastructure
- Lack of laboratories to examine the recycled material in Israel (sorted material, recycled materials, CE certification, PCR rate in products, analysis, migration and more)
- Lack of a horizontal definition for "recycling" activities, which creates uncertainty regarding eligibility for incentives
- No standardization of rPP and rPE
- Lack of cross-cutting initiatives of the use of PCR in secondary packaging and toiletries (lack of incentives? of knowledge? standardization?)

## **Infrastructure**

- The lack of sufficient government support for the establishment / improvement of infrastructure (washing, recycling, pyrolysis, etc.)
- PS - no recycling plants in Israel

- Absence of preferences to use PCR plastic in public procurement
- No sorting of flexible packaging in Israel
- No sorting and separation of PS, PP and PE packaging in Tmir and other municipal sorting facilities
- No collection and recycling capabilities of agricultural films
- An objection of municipalities to establish waste treatment facilities in their territories
- Low collection rates for beverage bottles in the Deposit Return System compared to other countries with DRS

### **Technology**

- Gap between the technological capabilities of converters in the development of recycling solutions, and the end infrastructure (sorting, recycling)
- Low recycling level (lack of investment in equipment and lack of knowledge)
- The support mechanisms require proof of technological innovation, or are too small in relation to what is required

### **Business environment**

- Fluctuation in prices of virgin materials
- No branding
- No source separation by users (low percentages compared to Europe)
- Lack of demand for PCR on the part of some brands versus high demand from other brands might increase PCR imports to Israel
- Lack of availability of raw materials for recycling
- Continuing to promote RDF or incineration will worsen the availability of plastic to recycling
- Lack of training workers to manufacturing PCR and in the recycling industry
- Lack of logistical chain assistance (transporting or drying)
- Mapping and promotion of collaborations in the industry (understanding demands and logistical partnerships)
- The retail sector is not an actor in environmental definitions of products and plastic-based logistics solutions (shipping boxes)

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