Municipal Solid Waste: The Problem and Economic Tools to Deal with It

- The quantity of municipal waste per capita in Israel is one of the highest among advanced economies, and the recycling rate is among the lowest in those countries.
- The waste problem in Israel is liable to become more severe due to population growth and an expected rise in the standard of living.
- Economic tools play an important role in mitigating waste quantity and improving waste treatment; Israel has been putting them to growing use in recent years. An improvement in setting the level of levies and expanding their incidence may enhance their contribution to dealing with the problem.

1. General remarks

Municipal solid waste—household garbage, commercial garbage, and yard waste[1]—causes considerable harm to the environment even when it is managed systematically. The nature and severity of the damage are affected by the quantity, composition, and methods of treatment of that waste. The growing worldwide awareness of these kinds of damage, together with the complexity of invoking policy tools to reduce the quantity of the waste and to treat it, are bringing the issue to the fore and spurring a continual search for appropriate tools. In Israel, the problem is already acute due to large quantities of waste per capita and a low recycling rate. Population growth and rising standards of living could make the situation even worse.

To negate the harmful environmental effects of municipal waste by reducing its quantity and improving its composition, economic tools are central due to their ability to influence people's behavior and their importance in creating funding mechanisms. Along with economic tools, which are often accompanied by regulatory tools, it is very important to enhance the public's awareness of the harm occasioned by this waste and of its ability to help mitigate the damage, particularly given the limitations of regulation and economic tools.

2. The harmful effects of municipal solid waste

The two principal ways of removing non-recycled waste systematically are landfill and incineration. The more these methods rely on advanced and stringent processes, the more the environmental damage associated with them can be reduced, albeit not totally eliminated.[2]

The damage occasioned by landfill includes pollution of soil, air, and water (surface and ground), greenhouse-gas emissions (chiefly methane), stench, taking up land, and

[1] Commercial waste is the kind created by businesses such as shops, marketplaces, offices, restaurants, shopping and entertainment centers. The definition of municipal waste excludes industrial waste, construction waste, and sewage. The disscussion here does not deal with them.

[2] Calculating the total cost of the damage (and comparing it with the cost of mitigation measures) is a very complex task, with which this discussion does not deal.

damage to open spaces. These ravages, or the risk of their occurrence, may last years after the landfill is closed. The greenhouse gases that originate in waste account for 8 percent of total greenhouse-gas emissions in Israel. The amount of land that Israel will have to set aside for landfill in the next twenty years is estimated at 250–400 hectares. Furthermore, the main landfill site is in the southern part of the country, making it necessary to haul the waste from population centers that are 150 kilometers away, on average.[3]

The damage caused by incinerating waste includes emissions of carbon dioxide and sundry air pollutants and the impact on land uses in the vicinity of the treatment facilities. The production of a unit of electricity by incinerating waste emits roughly as much greenhouse gas as would be emitted by using natural gas.[4] Building several incineration facilities near population centers may reduce the cost of transporting the waste but would not eliminate it totally.

3. Quantity and recycling rate of waste in Israel

Israel has one of the highest quantities of per-capita municipal waste in the developed world. This quantity has been growing over time, albeit less rapidly than the increase in income (Figures 1a, 1c).[5] The increase in quantities of waste as standards of living rise is not unique to Israel: A positive correlation is also evident when comparing among OECD countries. Such an increase, however, is not inevitable; several OECD countries have managed to reduce their quantity of per-capita waste considerably since 2000 despite per-capita GDP growth.[6]

The positive relation between the socioeconomic index of local authorities in Israel and the quantity of per-capita waste that they generate (Figure 1b) is consistent with the correlation described above. An econometric analysis of the determinants of the quantity of waste per capita in local authorities corroborates the correlation (Table 1). The elasticity of this quantity with respect to the average wage in the locality,

[3] Ministry of Environmental Protection (2018), *Policy Document on Promoting the Construction of Facilities for Energy Recovery from Municipal Waste in Israel*. For a survey of additional partial estimates of the cost of landfill use in Israel, see Doron Lavee (2020, forthcoming), "Environmental Economics in Israel," *The Israeli Economy, 1995-2017: Lights and Shadows in the Market Economy,* edited by Avraham Ben-Bassat, Reuven Gronau, and Asaf Zussman, Cambridge University Press (hereinafter: Lavee, 2020).

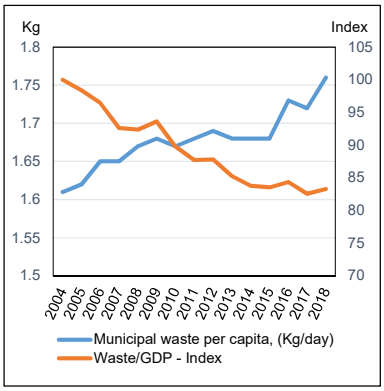
[4] Ministry of Environmental Protection (2018), *Policy Document on Promoting the Construction of Facilities for Energy Recovery from Municipal Waste in Israel.*

[5] Figure 1c shows 2017 data; therefore, several countries are missing. The 2015 data, covering most OECD countries, indicate four countries generate more waste per capita than Israel does—the US, Switzerland, Germany, and Luxembourg.

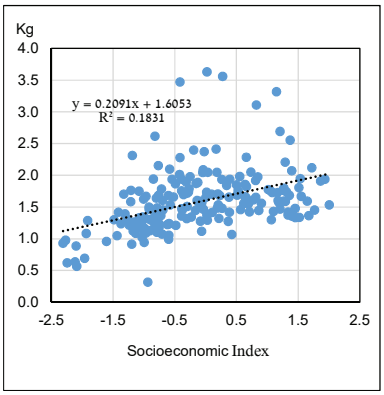
[6] OECD (2019). *Waste Management and the Circular Economy in Selected OECD Countries: Evidence from Environmental Performance Reviews* (hereinafter: OECD, 2019).

Figure 1
Municipal Waste in Israel and the OECD

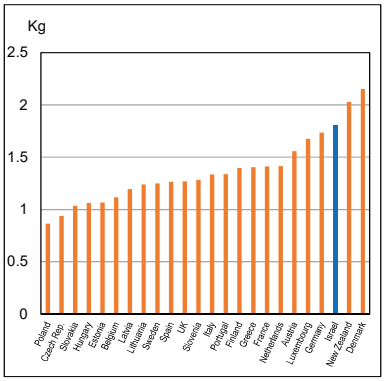
A. Waste per Capita (Kg/day) and Ratio of Waste to GDP (Index), Israel 2004–18



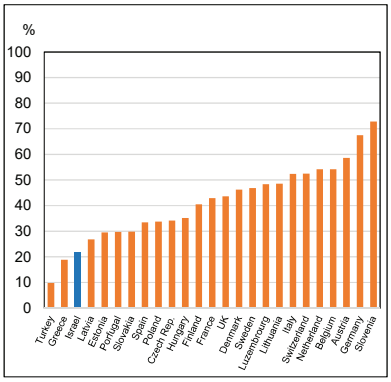
B. Waste per Capita (Kg/day) and the Locality's Socioeconomic Index, Israel 2018[a]



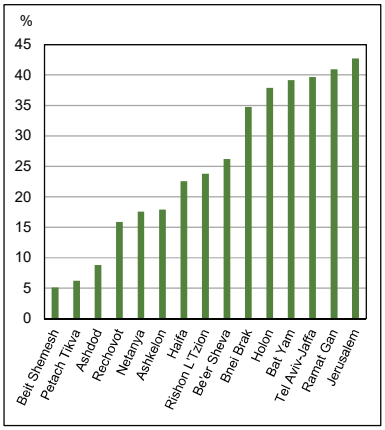
C. Waste per Capita (Kg/day), OECD, 2017



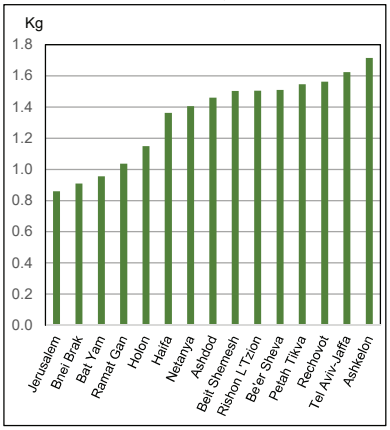
D. Recycling Rate[b], OECD, 2017



E. Recycling Rate[b], Large Cities in Israel[c], 2018



F. Waste for Landfill (Kg per capita, per day), Large Cities in Israel[c], 2018



[a] Cities and local councils. The socioeconomic index - 2015 data. Two outlier observations were excluded from the figure, adding them in strengthens the positive correlation.
[b] Recycling rate: The weight of waste (including yard waste and organic matter) sent for recycling as a percent of total weight of waste.
[c] Cities with a population at the end of 2018 of more than 100,000 residents.
SOURCE: Based on Central Bureau of Statistics and OECD.

controlling for locality characteristics,[7] is estimated at 0.39, meaning that a 10 percent increase in income boosts the quantity of waste per capita by 3.9 percent. A locality's recycling rate, however, also rises with income; as a result, the per-capita quantity of waste hauled to landfill does not increase significantly with income. This emphasizes the importance of recycling as one of the ways to cope with the waste problem. In practice, Israel has one of the lowest recycling rates in the developed world (Figure 1d).[8] The perceptible differences among Israel's major cities in their recycling rates (Figure 1e) suggest that improvements in municipal conduct may boost these rates and reduce the quantities of waste that are taken to landfill (Figure 1f). Obviously, this quantity also depends on the amount of raw (pre-recycling) waste, which is influenced by various local characteristics (Table 1).

Table 1
Determinants of waste quantity and recycling rates, local authorities in Israel[1], 2018

	Per-capita waste (log kg/day)		Waste to landfill (log kg/day/ per capita)		Recycling rate	
	(1)	(2)	(3)	(4)	(5)	(6)
Avg. wage in locality (log)[2]	0.457***	0.386***	0.133*	0.055	25.127***	25.685***
	(0.068)	(0.063)	(0.074)	(0.071)	(2.774)	(2.877)
Area liable to residential property tax as a percentage of total tax-liable area		-0.003***		-0.003***		-0.047
		(0.001)		(0.001)		(0.032)
Area liable to commercial property tax as a percentage of total tax-liable area		0.043***		0.039***		0.296
		(0.006)		(0.007)		(0.275)
Population density per built residential area (log)[3]		-0.157***		-0.213***		4.531***
		(0.036)		(0.04)		(1.629)
R^2	0.187	0.391	0.016	0.215	0.293	0.335
No. of observations	201	197	200	196	200	196

1. Not including regional councils.
2. Average monthly wage, employees, 2017.
3. 2013 data.
Source of data: Central Bureau of Statistics (2018 local authority data file), processed by Bank of Israel.
* Denotes 10% significance level; ** 5% significance level; *** 1% significance level

7 The more nonresidents reach a locality for employment, commerce, tourism, services, and leisure purposes, the more the locality would be expected to generate waste relative to its own population. The percentages of areas liable to residential and commercial property tax have a significant effect, in the expected direction, on the quantity of waste per capita. (Since municipal waste does not include industrial waste, there is no need to control for the extent of industry in the locality.) The less densely populated a locality is, the more area we would expect to find devoted to private gardens per capita, resulting in more yard waste. The coefficient of population density per built area comports with this hypothesis. Public-garden area per capita is not found to have a significant effect, possibly due to a large number of missing observations. There are no data that separate yard waste from waste at large.

8 The recycling rate includes recycling of organic waste, which in Israel today is comprised largely of composting— transforming organic waste into fertilizer.

The composition of waste strongly affects its potential for treatment and recycling as well as for environmental harm. Today, there are no authoritative data on the composition of total waste in Israel in terms of substances and sources (household, commercial, yard waste). Food residues account for about one-third of household waste in terms of weight; plastic contributes only 18 percent of weight but 40 percent of volume.[9] Plastic is common in both packaging and products. Many policy tools in Israel and other countries concern themselves with it, due to both the damage it causes and the practicability of limiting its use or separating it from other waste and recycling it.[10]

4. The waste management problem—basic characteristics and principles of treatment

Like other environmental issues, the basic problem with waste is a market failure: Producers of waste do not internalize the externalities of their behavior. Therefore, the optimal and practicable solution for many environmental problems lies in identifying polluters and making them pay for their activity (or submit to compulsory regulation).[11]

Charging households or businesses a fee in accordance with the quantity and composition of the garbage they produce would do much to correct the market failure. The problem that makes municipal waste special is the difficulty in collecting such a fee (or enforcing regulation) at the time individuals toss their garbage. Furthermore, while the municipal authority collects and disposes of garbage in a concentrated way, and thus sustains the cost of these activities, it is not directly affected by much of the damage occasioned by the waste (after it is collected)—necessitating policy tools that will cause the authority, too, to internalize this damage.

Figure 2, plotting the life of a product from manufacture to the end of its treatment as waste, helps to demonstrate the problem and the principles of management derived from it. The difficulty in charging a fee when something is put in the garbage restricts the use of economic tools that act directly on this stage of the product's life, in which dependency on individuals' voluntary behavior is high. Accordingly, policy tools based on taxation, fees, and regulation focus on other stages of product life—manufacture, purchase, and management of waste (and of recyclable materials)—and are meant to

[9] Ministry of Environmental Protection (2014), *National Survey on the Composition of Waste, 2012–2013.*

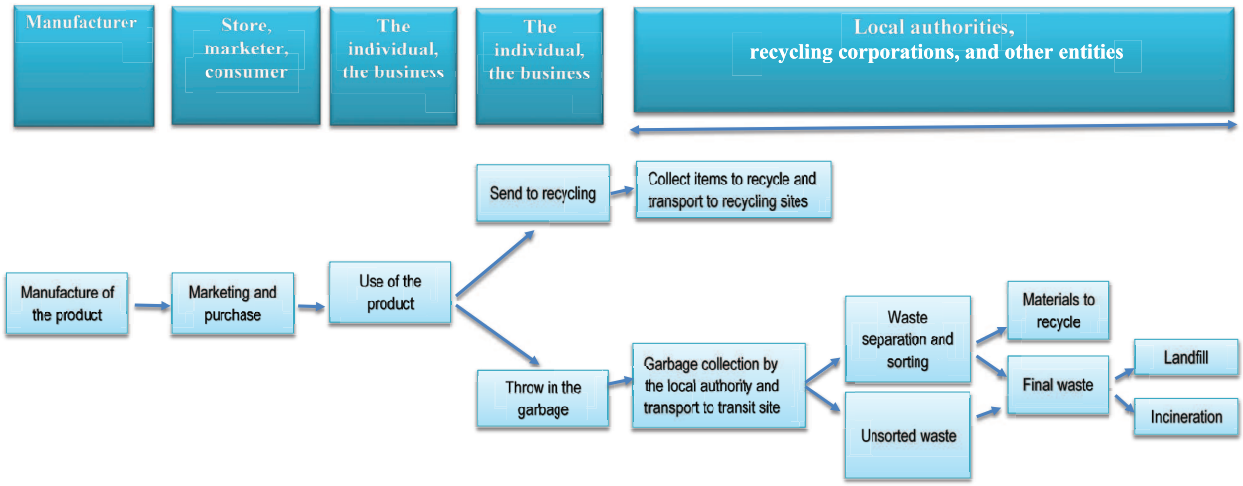
[10] The discussion here focuses on municipal waste that is systematically treated. One of the characteristics of plastic is the ease with which some of it (e.g., bags and disposable utensils) evades systematic treatment and reaches open areas, including bodies of water, causing their degradation.

[11] Examples are taxation of fuel, coal, and carbon. Taxes or regulation on the basis of direct measurement—emissions of pollutants by factories and motor vehicles, monitoring of effluent at factory exit. Advanced taxation of travel, e.g., via congestion pricing—is developing rapidly in the wake of new technologies. The consumer water rate makes it possible to build in a payment commensurate with the quantity of sewage that the consumer creates.

influence the other stakeholders as well: producers, vendors, local authorities, and so on.

From the environmental standpoint, reducing gross waste is at the top of the scale, followed by recycling, and, finally, optimal disposal of final waste. Thus, the right thing to do from this perspective is reduce the quantity of final waste as much as possible and to affect its composition, by using tools that aim to influence behavior upstream (in the manufacturing, marketing, and consumption stages) even if they are implemented downstream. As for the final waste created, the question is which method of disposal is preferable—landfill or incineration? This question is not discussed here.

Figure 2
The Product Lifecycle



5. Policy tools for waste quantity mitigation and treatment[12]

Table 3, at the end of the discussion, maps the main types of policy tools for waste management and those used in Israel and, pursuant to Figure 2, classifies them by the stages in product life at which each tool is put to use. This separation is somewhat artificial because the stages are linked and some of the tools operate at more than one stage.

(1) Manufacture, vending, and purchase

The purpose of tools that focus on the manufacturing, importation, and purchase stages is to mitigate the waste problem before it is created (i.e., at source) by affecting the composition of materials used in manufacturing the product. As the players (manufacturers, importers, consumers) can be readily identified at this stage, it is relatively easy to levy taxes and duties—that may be used to fund management of the waste at the end of product life—and to enforce product standards.[13] A conspicuous example abroad is the ban on, or mandatory charging for, single-use plastic shopping bags. In Israel, large food chains have had to charge for them since the beginning of 2017. Thus far, this is the only tool in Israel that is designed to mitigate municipal waste at source. In its first year of effect, the number of bags taken by customers at these chains declined by 80 percent.[14]

(2) End-of-use stage

When a product reaches the end of its use, the consumer decides whether to throw it out or to sort it and transfer some of it to recycling. At this stage, as stated, it is very hard to measure the quantity and composition of garbage that individuals toss. There are few examples of charging individuals commensurate with the quantities of waste that they produce, and most are based on rough and indirect estimates of the amount of the waste—meaning that individuals are not charged the real marginal cost. Actual measurement is rare and in many ways problematic.[15]

[12] For a detailed survey of the range of tools applied by various countries, see OECD (2019) and Thornton Matheson (2019), "Disposal is Not Free: Fiscal Instruments to Internalize the Environmental Costs of Solid Waste," *IMF Working Paper WP/19/283* (hereinafter: Matheson, 2019).

[13] These measures may be susceptible to pressure from groups that are harmed by the proscription of a given product or the raising of its price. As a result, these taxes are often imposed at a low rate or with narrow incidence, to the detriment of their effectiveness (Matheson, 2019).

[14] Thirty-five countries prohibit sale or apply mandatory charging today (Matheson, 2019). For discussion of Israel's statute and its effects, see Box 2 in Chapter 6 of the Bank of Israel *Annual Report* for 2017, pp. 196–200.

[15] Such mechanisms are called PAYT—"Pay as You Throw." South Korea is the most advanced country in its use: Households there pay commensurate with the quantity of unseparated waste and, from 2010 on, for food waste, that they throw out. The scheme abounds with implementation problems, including difficulty adjusting the rate. Limited PAYT systems are also in effect in parts of the Netherlands and the Czech Republic (OECD, 2019). PAYT is better suited to rural and suburban areas that have private homes than to apartment buildings. They come with high operating and enforcement costs and may encourage illegal dumping and other undesired behaviors to evade payment (Matheson, 2019).

Thus, waste sorting at this stage relies on individuals' voluntary conduct (separating waste and placing it in separate receptacles, for no monetary gain) and positive monetary incentives (as opposed to taxes and fines), such as deposits on packaging. (In Israel, deposits on certain beverage containers are mandatory under law.) Policy tools geared to this stage focus on enhancing awareness in order to encourage voluntary behavior and on creating an infrastructure to support it (putting out separate bins, activating deposit and redemption mechanisms, and collecting and hauling the separated waste). The funding and operating framework for this activity is often based on extended producer responsibility (EPR).

In EPR, manufacturers (and importers) are responsible for collecting waste created at the end of product life and treating it and/or paying for the environmental damage that it causes. Laws may include mandatory reacceptance of the product, recycling targets and fines for failure to meet them, and fees on manufacturers to fund the activity. Corporations such as recycling corporations often handle the operational end. EPRs are common around the world, especially for packaging but also for electronic waste, batteries, and lubricants. According to the OECD (OECD, 2019), they are typically relatively successful but encounter difficulties in enforcement, funding, and so on. Israel has four EPR laws that relate to collecting and recycling beverage containers, tires, packaging, and electric and electronic appliances, and batteries.[16] The collection/recycling targets set in these statutes and the rates attained are itemized in Table 2.

Table 2
Producer responsibility laws in Israel—Statutory targets and their attainment

Law		Statutory recycling rate target	Actual recycling rate	Reference year in target and attainment[1]
Deposit on Beverage Containers Law, 1999[2]				
Containers up to 1.5 liter		77	78[3]	2015
1.5–5 liter containers		55	57[4]	2017
Disposal and Recycling of Tires Law, 2007[5]				2017–18
Tire importers		85	83.7	
Motor-vehicle importers		25.5	27.7	
Packaging Management Law, 2011[5]				2015
	All packaging	60	77.1	
Thereof:	Paper and cardboard	60	113.7	
	Metal	50	54.6	
	Wood	15	175.4	
	Plastic	22.5	24.6	
	Glass	60	0.5	
Environmental Management of Electric and Electronic Equipment and Batteries Law, 2012[5]		20	20	2015

[1] The latest year for which data exist.

[2] The rates in the table pertain to rates of collection. The law specifies compulsory recycling of 90 percent of containers collected.

[3] Recycling rate data—Lavee (2020).

[4] Ministry of Environmental Protection, https://www.gov.il/he/departments/news/large_bottle_producers_met_recycling_target

[5] Ministry of Environmental Protection, annual reports on implementation of these statutes, various years. For some materials, recycling rates may exceed 100 percent because they are calculated in terms of the weight of material treated relative to that of material vended in the year in question.

[16] For details on these statutes, see https://www.gov.il/he/departments/guides/extended_producer_responsibility. The law on deposits for soft-drink containers was not of the extended producer responsibility type at first but became so under an amendment that passed in 2010.

(3) Treatment after collection

The main economic tool that internalizes the externalities of managing waste after it is thrown away is a fee (flat or differentiated by types of waste) on the final quantity of waste that the local authority hauls to landfill or incineration. Apart from funding disposal cost, the fee is meant to incentivize the authority to reduce the final quantity of waste and improve its composition. It can do this mainly by encouraging residents to separate at source or by sorting at the transit site, thus raising the recycling rate (and that of treatment of organic matter). The authority rolls over the cost of the fee, like the other costs of waste management, to its citizens and presumably has an interest in reducing such costs. However, as stated, it is unable to pass the costs on to individual citizens commensurate with the amount of waste they produce, thereby influencing their behavior. Many countries charge landfill fees and some have in fact seen a decline in landfill rates (OECD, 2019). At times, such a decrease occurs not only due to more recycling, i.e., less waste, but also by switching to incineration.

In 2007, Israel introduced a landfill fee that varies by different kinds of waste. The proceeds, accumulated in a separate account kept by the Cleanliness Maintenance Fund, are meant mainly for developing, constructing, and enhancing the efficiency of alternatives to landfill.[17] The switch from multiple local landfills to a small number of national landfills means that the landfills are far from most local authorities. This lessens the authorities' direct exposure to landfill hazards such as odor and air pollution; therefore, it makes the fee more important as a way to internalize the externalities. In addition, local authorities do incur the direct cost of hauling waste to longer distances but have not internalized the adverse external effect of this hauling.[18]

6. Conclusion: The situation in Israel and possibilities of improving its economic policy tools

Israel generates large amounts of per capita municipal waste by developed countries' standards and is producing increasingly more. Absent a suitable policy, the country's economic and demographic development is likely to aggravate the problem further. Over time, however, the management of this waste has been improving: all unregulated landfills have been shut down, landfill quality has improved, burial of certain kinds of waste has been prohibited, more use is made of economic tools to cope with the waste, recycling rates have risen—even though they remain very low by international standards—and in 2020 a sweeping ban on burial of packaging waste was due to have gone into effect. The Cleanliness Maintenance Fund was established for purposes including treatment and recycling of waste. The Ministry of Environmental Protection's strategic plan for waste treatment through 2030 centers on sharply

[17] The fund has built up large cash balances. Per government resolution, some were transferred to other uses in the state budget and were replaced with spending-authorization budgets.

[18] In the first five years, the government subsidized the increase in haulage cost on account of the transition to distant landfills at a rate that declined over time. For further details of the process and the transition to central landfills, see Lavee (2020).

reducing the share of waste taken to landfill by engineering a major upturn in the recycling rate and incinerating non-recyclable waste. (One of the advantages of this method is the possibility of energy recovery.)[19] A mainstay of the plan is improving the ability to sort waste at the transit sites.

Looking ahead, several improvements of the economic tools should be considered:

The deposit on beverage containers: The potential gain from raising the deposit and expanding its incidence to larger beverage containers and additional kinds of packaging is worth exploring. The gap between the rate of reclamation of small containers, which carry a deposit, and large ones, which do not, gives an indication of what expanded incidence might contribute to boosting recycling rates (Lavee, 2020).

Raise the plastic-bag fee and broaden its incidence: The sharp decrease that followed the introduction of the fee shows that a minimal charge sometimes suffices to catalyze a major behavioral change, especially if consumers have alternatives handy.

Tax single-use plastics: The environmental damage that these products cause seems to be no less than that of plastic beverage containers and shopping bags. They have partial substitutes, the world is increasingly aware of the need to limit their use, and several countries have already imposed, or stated their intention of imposing, restrictions on their manufacture or sale. Questions of sharing the burden among different population groups may make public support harder to mobilize.

Offer a financial incentive for collection of batteries and electrical and electronic appliances: Currently, the law facilitates citizens in handing over worn-out items such as these for systematic disposal because businesses and local authorities are required to accept them and to contract with a licensed recycling corporation to dispose of them. The corporation even pays businesses or authorities for the cost of collecting and storing the waste until disposal. The law, however, does not give citizens a financial incentive to prefer this course of action over tossing it to the garbage bin or dumping in the street. It is worth considering a cash award to citizens who bring these appliances to a recognized collection point (in cases where vendors are not required to remove them from customers' homes). The funding for this may be arranged, for example, by upping the fee that manufacturers and importers pay the corporation today.

Raise the landfill fee and make it more differential: Israel's landfill fee is very low by advanced economies' standards and does not give local authorities enough of an incentive to switch to alternatives, including separation and recycling facilities that involve high construction costs.[20] The fee today is the same for all local authorities; it is worth considering differentiating it in accordance with the locality where the waste originates. Setting the fee commensurate with the locality's average income (or its rank on the socioeconomic index) would make it more effective by establishing a dependency between fee and income.

[19] https://www.gov.il/he/departments/policies/strategic_plan_for_waste_treatment_by_2030

[20] For an international comparison of this fee and discussion of the need to increase it, see OECD (2019) and Lavee (2020).

Table 3
Possible policy tools and mechanisms for municipal waste treatment, by stages in product life

Stage in product life	Possible tools/ mechanisms	Examples from abroad (measures in place or being considered, partial list) and remarks	What has been done in Israel?
Manufacture[1]	Standards for manufacturing inputs	- Banning use of certain materials - Mandatory use of recyclable materials - Mandatory pro-recycling manufacturing - Mandatory manufacture of reparable products	
	Taxation of raw materials or products in view of harmfulness of their waste		
Purchase	Ban/limits on sale/use of products	- Ban on sale of single-use plastics and/or limits on their use	
	Taxation of products or materials	- Charge for single-use plastic bags - Tax on tires - Tax on batteries - Deposit on beverage containers	- legislation on single-use bags - deposit on beverage containers (small plastic bottles, glass bottles, metal cans)
	General-government green procurement	Preference for recycled or recyclable products	"Green government" resolutions 1057, 5090: targets for green procurement, recycled paper, single-use cups
End of use	Redemption of deposit on packaging	Very common	Redemption of deposit on beverage containers
	Charging in accordance with quantity/composition of waste disposed (PAYT)	Small number of examples abroad (Korea, Netherlands, Czech Republic); very hard to implement and enforce	
	Voluntary separation at source (without fines/monetary incentives) of types of waste by individuals	- Common types: paper, plastic, glass, metal - Uncommon types: organic matter (food residues) - Funding mechanisms for placement of separate receptacles and waste collection	In some local authorities: separate receptacles for packaging, paper, glass, batteries, and organic waste
	Extended producer responsibility (EPR)	Very common	4 laws: beverage containers; tires; packaging; electrical and electronic appliances and batteries

Treatment of waste after collection			
Recycling	Sorting facilities	Tools for funding of construction and operation of facilities, e.g., subsidies and tax benefits	Support from Cleanliness Fund
	Recycling facilities	- Benefits and incentives for facilities - Incentives to whet demand for recycled materials	Support from Cleanliness Fund
	Export of separated materials to recycling plants abroad		Some exporting is allowed and even recognized for meeting recycling targets (Packaging Law)
Treatment of final waste	Landfill fee	Flat landfill fee or differentiation by type of waste or extent of landfill compliance with environmental standards	Landfill fee differentiated by 5 types of waste (not only municipal) since 2007
	Incineration fee	Flat incineration fee or differentiation by type of waste, incineration method, emissions from incineration, with/without energy recovery	
	Restrictions/ban on burial	- Sweeping ban on burial - Ban on burying certain kinds of waste (tires, batteries, some organic wastes, recyclables, unsorted waste, untreated food residues)	- Ban on burying tires since 2013 - Ban on burying packaging starting 2020, with option of postponing implementation
	Upgrade of landfills	- Closing unregulated garbage dumps - Upgrading landfills in accordance with strict standards	All unregulated garbage dumps were closed by 2003

[1] In principle, this may be applied to imports as well.

Israel is an outlier among developed countries in that it makes almost no use of incineration for waste disposal. The Ministry of Environmental Protection's policy for the coming years is to prefer incineration over landfill. Each method has its advantages and drawbacks, but for our purposes the economic principle is the same: Whichever disposal method is chosen, it is important to set a fee for incineration and for landfill in order to reduce the quantity of waste for final disposal and encourage recycling. The considerations for differentiating the landfill fee are valid (mutatis mutandis) for the incineration fee as well. The difference between the fees should reflect the environmental cost–benefit balance between them (beyond the operational cost–benefit balance) and should not distort the incentives in a way that would influence the choice of one over the other.

Index the fees to the average income in the economy: Such an indexation can prevent the effectiveness of the fees (deposit on beverage containers, plastic-bag fee, landfill fee, a future incineration fee) from eroding as tools for influencing players' behavior.

Concurrent with action to improve the economic tools, it is important to enhance awareness among the public and the public entities of the importance of adapting behavioral changes that will help to mitigate waste quantity at source and raise the recycling rate. The initiatives of several entities to reduce the use of single-use plastics, are a case in point.