



Expert Facility Activity No: EFH-IL-3

Main issues and problems identified in the Israeli plastic market and recommendations

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1	Main issues and problems identified in the Israeli plastic market and recommendations	Françoise Bonnet, Helmut Schmitz, Lisa Labriga,	Tamar Raviv



THE SWIM AND H2020 SUPPORT MECHANISM PROJECT (2016-2019)

The SWIM-H2020 SM is a Regional Technical Support Program that includes the following Partner Countries (PCs): Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, [Syria] and Tunisia. However, in order to ensure the coherence and effectiveness of Union financing or to foster regional co-operation, eligibility of specific actions will be extended to the Western Balkan countries (Albania, Bosnia Herzegovina and Montenegro), Turkey and Mauritania. The Program is funded by the European Neighbourhood Instrument (ENI) South/Environment. It ensures the continuation of EU's regional support to ENP South countries in the fields of water management, marine pollution prevention and adds value to other important EU-funded regional programs in related fields, in particular the SWITCH-Med program, and the Clima South program, as well as to projects under the EU bilateral programming, where environment and water are identified as priority sectors for the EU co-operation. It complements and provides operational partnerships and links with the projects labelled by the Union for the Mediterranean, project preparation facilities in particular MESHIP phase II and with the next phase of the ENPI-SEIS project on environmental information systems, whereas its work plan will be coherent with, and supportive of, the Barcelona Convention and its Mediterranean Action Plan.

The overall objective of the Program is to contribute to reduced marine pollution and a more sustainable use of scarce water resources. The Technical Assistance services are grouped in 6 work packages: WP1. Expert facility, WP2. Peer-to-peer experience sharing and dialogue, WP3. Training activities, WP4. Communication and visibility, WP5. Capitalizing the lessons learnt, good practices and success stories and WP6. Support activities.



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ABBREVIATIONS

BB	Bring Bank
CO ²	Carbon dioxide
d	Day
DtD	Door-to-Door
ELA	ELA Recycling Corporation
EPR	Extended Producer Responsibility
GPP	Green Public Procurement
NIS	New Israeli Shekels
Inh.	Inhabitants
l	Litre
m	Month
MoEP	Ministry of Environmental Protection
MRF	Materials recovery facility
NIMBY	Not in my backyard
NIS	Shekel
p	person
PET	Polyethylene terephthalate
PRO	Producer Responsibility Organisation
t	Tonne
VAT	Value-added tax
w	Week
WEEE	Waste Electrical and Electronic Equipment



INTRODUCTION AND METHODOLOGY

There are several laws and regulations that relate to waste collection, waste disposal, and recycling in Israel. The Deposit on Beverage Containers Law; The Cleanliness Law; The Packaging Law and the most recent Plastic Bag Law which took effect on January 1, 2017, aimed at motivating Israelis to use environmentally-friendly reusable bags and reduce the amount of polluting plastic bags that are produced in Israel. With the entry into force of this new law, Israel joins many other countries around the world in a global effort to reduce the amount of disposable plastic bags accumulating in the world's garbage dumps, parks and oceans.

Nevertheless, Israel has not yet addressed an integrative approach to plastic waste management. Therefore, EFH-IL-3 activity contributes to the introduction of measures, strategies including a National Plastic Waste Management strategy and financial tools that will help to strengthen the domestic plastic recycling market.

The main objectives reached by the EFH-IL-3 activity are:

- To assist in the promotion of the recycling of plastic materials and divert plastic materials away from landfills by analyzing the problems of plastic waste management and recycling;
- To assist in developing measures, strategies (including a National Plastic Waste Management Strategy) and financial tools that will help to strengthen the domestic plastic recycling market.
- To contribute to the enforcement of the new law on plastic bags

Target groups for this activity were: Ministries/Government Authorities, Local Authorities/Municipal groupings, the private sector including recycling companies.

The Consultant undertook the following tasks:

- Task 1: Organization of meetings with the Israeli Ministry of Environment Protection (MoEP) representatives, industry and other stakeholders previously selected by MoEP, namely: The Ministry of Economics, Manufacturers Association; Green-Net sorting station; Green Point Recycling; The Accredited Body TAMIR; Aviv Recycling Ltd.; Danieli Environment Co. ; KB Recycling Co. (Annexes I to VII of this report include a description of stakeholders and their view of the plastic recycling market in Israel).
- Task 2: Organization of a stakeholder workshop and meetings with MoEP representatives and local financial experts

Outcomes of the aforementioned tasks are:

- Assessment of the plastic recycling and recovery market including Extended Producer Responsibility (EPR) laws in Israel;
- Elaboration on best practice of the plastic sorting and recycling industry in the EU (facilities and techniques);



- Stakeholders and experts discuss key drivers, incentives and economic tools for improvement of the rate of plastic waste recovery and recycling ;
- Recommendations for the development of a National Plastic Waste Recovery and Recycling policy.

The activity has been developed under the 'Solid Waste Management' thematic of SWIM-H2020 SM and has been designed in complementarity with three other Expert Facility activities taking place in Israel:

- EFH-IL-1: Green and circular public procurement in central and local government in Israel, through policy development and capacity building for manufacturers and procurers;
- EFH-IL-4: Support for the glass waste management and recycling;
- EFH-IL-5: Assistance in introducing Construction and Demolition (C & D) waste management.

Also, the activity is linked to the following regional activities of SWIM-H2020 SM:

- (REG-1) on "Overview of the developments in Europe and the Mediterranean (see relevant protocol) on Marine Litter monitoring. Correlations with policies dealing with the use of plastics (particularly plastic bags)" (WP3).
- (REG-9) on "Green economy focusing on technical support on SCP for SMEs with emphasis on whole life cycle of services and products (circular economy, eco-design, eco innovation)"

The activity took place in Israel during 3 days from Tuesday, July 11th to Thursday July 13th, 2017. Experts Françoise Bonnet and Helmut Schmitz, accompanied by ACR+ staff member, organized following actions:

- Meetings with: Israel Ministry of Environmental Protection and Ministry of Economics representatives, representatives of the Manufacturers Association of Israel and the Green-Net Sorting station (11/07/2017);
- Meetings with representatives of: Israel Ministry of Environmental Protection "Green Point" Recycling Co., TAMIR Accredited Body, Aviv Recycling Industries Ltd, Danieli" Recycling Co. (12/07/2017);
- Site visits at: Infimer Ltd., K.B. Recycling Industries Ltd., Heritage Site

BACKGROUND: PLASTIC WASTE MANAGEMENT IN ISRAEL

The responsible bodies for Municipal Solid Waste collection and treatment in Israel are the local authorities under the Ministry of Interior. The Ministry of Environmental Protection is responsible for setting the National Policy, guidelines and strategy for waste management, legislation and enforcement of the laws, and for providing financial support for development of infrastructure and national programs aimed at promoting recycling and recovery. There is Environmental Agency in Israel and there is one accredited body (Tamir) that collects packaging waste under the Packaging Law. Recently, 5 municipal Groupings (clusters) have been established in Israel, which could make positive changes for the “economy of scale effects” for municipalities, regarding collection, transportation and treatment of waste.

Municipal Solid waste management is an important issue in Israel: While 5.34 million tonnes of municipal and commercial waste were generated in Israel in 2016, approximately more than $\frac{3}{4}$ (78%) of this waste is currently buried in landfills and less than $\frac{1}{4}$ is recycled. Due to a high population growth, Israel is furthermore facing growth of waste production by 1.8 % per year (100.000 t/a).¹

Plastic waste is one of the crucial waste streams that need to be addressed. After organic material, it is the second largest fraction by weight in the solid waste composition with an estimated 18% of the total amount of municipal waste (see figure 1).

Considering the volume of waste, plastic constitutes the largest fraction (41.1 %).² Taking into account that this analysis is based on data from 2012 and considering the growing market of plastic products and packaging, the share of plastic in the total waste fraction could be even higher. While being one of the largest fractions in the municipal waste stream, the recycling performance for plastic waste shows substantial lacks: only around 6 % of all plastic is recycled annually.³

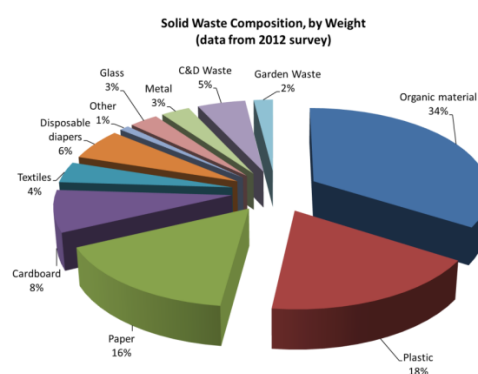


Figure 1: Solid waste composition by weight

¹ Source: http://www.sviva.gov.il/English/env_topics/Solid_Waste/FactsAndFigures/Pages/default.aspx

² See here: http://www.sviva.gov.il/English/env_topics/Solid_Waste/FactsAndFigures/Pages/default.aspx

³ Source: http://www.sviva.gov.il/English/env_topics/Solid_Waste/FactsAndFigures/Pages/default.aspx



0.1 KEY LEGISLATION

Four key pieces of legislation have the biggest influence on the current plastic waste management system in Israel: (1) the Deposit on Beverage Containers Law and its Amendment from 1999/2010; (2) the Amendment of the Cleanliness Law in 2007; (3) the Packaging Law of 2011; (4) and the Plastic Bag Law of 2016. For a better understanding, each of the laws will be briefly described in a subchapter. The information has been gathered from the websites of the Ministry of Environmental Protection (MoEP) and *via* direct information from the staff of the MoEP and the aforementioned stakeholders.

0.1.1 Deposit on Beverage Containers Law and Amendment, 1999/2010⁴

The Deposit on Beverage Containers Law (further: Deposit Law) came into effect in 2001 and was amended in 2010. Consumers were required to pay a NIS 0.25 deposit on a purchased beverage container that holds up between 0,1 and 1.5 liters, to be reclaimed when the empty container was returned to the sales point or other collection point. The deposit was increased to NIS 0.30 in 2010. Bottles larger than 1.5 litres are not included in the deposit system: consumers can throw larger containers on a voluntary basis in street containers ("cages") provided by local authorities or private recycling. The Beverage Container Law is Israel's first EPR regulation. Israel's EPR system today includes related tires, product packaging, electrical and electronic equipment, and batteries

In order to implement the law, a recycling corporation – ELA Recycling Corporation (further: ELA) was established to institute a refund, bottle collection, and recycling system. The recycling corporation is required to comply with the graduated targets for the collection of empty beverage containers:

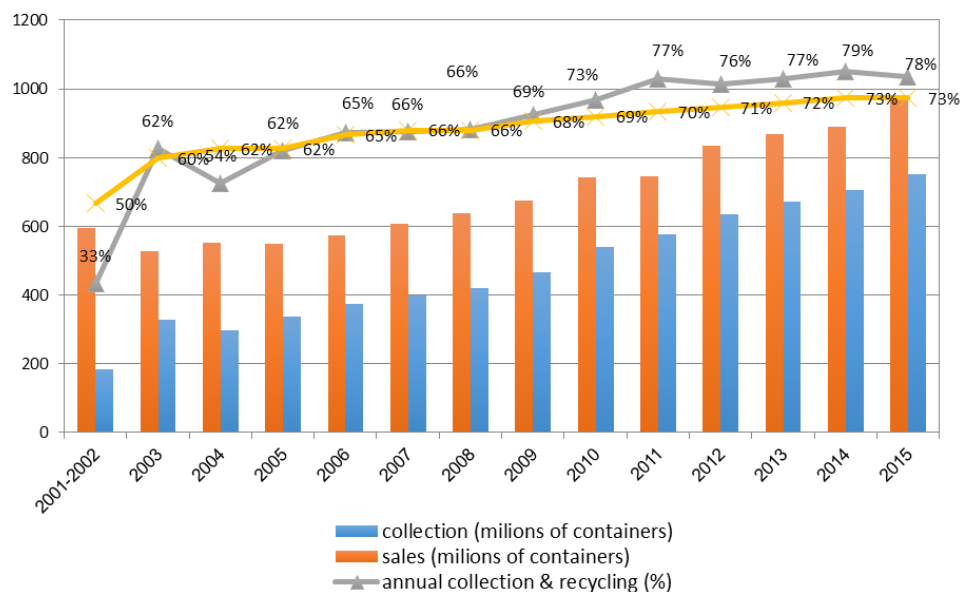
- Collection of beverage containers smaller than 1.5 liters increased to 73% to be reached by 2014 and onwards;
- Recycling of 90% of all empty beverage containers smaller than 1.5 liters (glass, plastic and aluminium) collected each year by importers and producers to be reached by 2014 and onwards;
- Non-compliance with targets leads to direct fines on manufacturers or importers.

Further provisions of the law:²

- Supermarkets and shops are obliged to accept containers from consumers up to an amount of 50 containers/p/d, otherwise they are subject to a fine;
- Prohibition of the sale of beverage containers which are not duly marked;
- Manufacturers and importers who are not members of the corporation have to transfer the unredeemed deposits to the Cleanliness Maintenance Fund.

The following graph exhibits the gradual targets and actual achievements for the deposit law for small beverage bottles (under 1.5L):

⁴ References: <http://www.sviva.gov.il/English/Legislation/Pages/WasteAndRecycling.aspx> and http://www.sviva.gov.il/English/env_topics/Solid_Waste/Extended-Producer-Responsibility/Pages/Beverage-Container-Deposit-Law.aspx



Additional activities under the the framework of the Deposit law include the Collection, treatment and recycling of large beverage bottles (bigger than 1.5L) by Manufacturers and importers according to amendment No.4 of the Deposit Law from 2016 and the Packaging Law. This action is currently being assessed by MoEP.

Organisation of the system (for small beverage containers):

- Collection of the deposit from the beverage manufacturers and importers registered in their system. The collection is operated by Ela Company, which is not a statutory body.
- Drink manufacturers / importers charge businesses 0.30 NIS deposit fee for each drink container. This fee is passed on to the consumer through the price of the drink.
- Ideally, the consumer returns the empty beverage containers to the business or municipal recycling station and receives his deposit fee back (0.30NIS).
- In practice, a large part of the empty small beverage containers are not returned via the businesses or municipal recycling stations. The main collection route is through cages for large beverage bottles.
- ELA collects the drink containers from its customers (= the businesses) and from the municipal recycling station and transports them to its processing centres.
- At the ELA's processing centres the material gets unloaded, controlled and the data is entered into the monitoring system. The beverage containers are then sorted by type of material and prepared to be transferred: as raw materials to the recycling companies, or for export.



0.1.2 Amendment of Cleanliness Law, 2007⁵

In 2007 (coming into effect on 1 July 2007), the Maintenance of Cleanliness Law of 1984 was amended with a regulation that requires landfill operators to pay a levy for every tonne of waste landfilled. The aim of the law was to internalize the full and real costs of waste treatment and disposal - including land consumption, air pollution, water pollution, soil pollution, and waste transport - thus paving the way to increased recycling and recovery.

The landfill levy is paid to a dedicated account of the Maintenance of Cleanliness Fund. The rate of the levy is set according to the type of waste - mixed waste, dry waste, waste residues after sorting, sludge, stabilized industrial sludge, and construction and demolition waste:

Table 0-1: Landfill levy per type of waste and type of landfill

Type of waste	Type of landfill	Levy (NIS/tonne)	Levy (€/tonne)*
MSW/ Food waste	Mixed	107.43	25.82 €
Dry household waste	Dry	71.62	17.21 €
Sludge	Mixed/Dry	143.24	34.43 €
Stabilized industrial sludge	Mixed/Dry	47.75	11.48 €
Construction & Demolition Waste	Dry	4.77	1.15 €

* Calculated based on ECB exchange rate of 27/07/2017: 4.1604 NIS = 1 Euro

The Maintenance of Cleanliness Fund is managed by the Ministry of Environmental Protection who collects the levy and redistributes the revenues of the fund to support development of facilities, recycling programs in Local Authorities and and communication on the improvement of waste management and recycling. The incomes from the levy are roughly 100.000 € annually. Since the introduction of the levy, the fund collected a total of 2,594,456 NIS.

0.1.3 Packaging Law, 2011⁶

The Packaging Law came into effect on 1 March 2011 and introduced the concept of Extended Producer Responsibility (EPR), to packaging, imposing the responsibility for dealing with the entire life cycle of a product directly upon manufacturers and importers of that product. The Packaging Law applies to a wide range of packaging products, both household and industrial, made of any material, including paper, glass, plastic, metal, and wood. It excludes beverage containers covered by the deposit law.

Legal obligations:

⁵ Sources: <http://www.sviva.gov.il/English/Legislation/Pages/WasteAndRecycling.aspx> and http://www.sviva.gov.il/English/env_topics/Solid_Waste/landfilling/Pages/LandfillLevy.aspx

⁶ Sources: <http://www.sviva.gov.il/English/Legislation/Pages/WasteAndRecycling.aspx> and <http://www.sviva.gov.il/English/Legislation/Documents/Packaging Laws and Regulations/PackagingLaw2011.pdf>



- Manufacturers and importers must thus either treat the packaging waste of their products, or pay for it to be treated by a company approved by the MoEP. They must also submit periodical reports to MoEP detailing quantity and weight of their products, material of packaging, and more. Manufacturers and importers that do not fulfil their obligations under the law are subject to fines, which are payable to the Maintenance of Cleanliness Fund.
- All local authorities must arrange for proper disposal and collection of packaging waste via contracting with the accredited body (Tamir). Tamir are obliged to make arrangements for the collection of packaging waste in their area, provide infrastructure for the separate disposal of packaging waste, and be in contact with the company approved for treating packaging waste to ensure the waste is collected. Local Authorities that fail to make appropriate arrangements, as subject to fines by the MoEP of up to NIS500,000.
- Individual citizens and store owners are obligated to throw packaging waste into the appropriate bins (Orange bins for packaging waste, Purple bring banks for Glass containers, Blue bins for paper).

Recycling targets and landfill ban:

- The law establishes targets for gradual recycling of 60% of the total weight of the packaging of products sold each year by 2014. Producers will also have to comply with annual recycling targets according to the type of material (e.g.: 22.5% of plastic, considerably lower as compared to 60% of glass, paper, and cardboard; 50% of metal;). Non-compliance with these targets will be subject to a sanction of NIS 2,500 per tonne.
- Under the packaging law - a total ban on landfilling of packaging waste should come into force in 2020.

Practical implementation:

- Currently there is just one accredited body for the treatment of packaging waste: TAMIR.
- TAMIR collects fees from the manufacturers and importers under their system and invests it in the collection and treatment of packaging waste.
- TAMIR enters in contracts with municipalities on the collection of packaging waste.
- Several arrangements for the (separate) collection of packaging waste are possible under the law and additional specifications from the MoEP. Local authorities can provide between 2-4 different types of bins to their citizens. The possible arrangements are:
 - Two bins: A brown bin for organic/biodegradable waste and a green bin for dry waste, including packaging.
 - Two bins: An orange bin for packaging waste and a green bin for all other waste
 - Three bins: A brown bin for organic/biodegradable waste, an orange bin for packaging waste, and a green bin for all other dry waste, excluding packaging.
 - Specific bins: combination of waste streams including paper and cardboard - collection as decided locally.



0.1.4 Plastic Bags Law, 2016⁷

The Plastic Bag Law, which was passed on March 28, 2016 and took effect on January 1, 2017, aimed at motivating the general public to reduce the amount of polluting plastic bags that are produced in Israel. The key points of the Plastic Bag Law are:

- Complete ban on distribution of "very thin" plastic bags (with a width of less than 20 microns) at large supermarkets.
- All large Supermarket chains (approximately 20 companies) must comply with the law and charge a levy of at least NIS 0.10 for bags at the cashier (that are between 20-50 microns). The fee for the bags must be listed on the customer's bill.
- Bags that come in direct contact with food, such as those provided for fruits and vegetables, can still be distributed without charge, as long as they do not have handles. The supermarkets are obliged to submit in their quarterly reports to the MoEP not only the number of bags sold, but also the number of bags they purchased, based on available stock. They are furthermore obliged to transfer the levy collected for those bags to cleanliness fund, managed by the MoEP. The funds will be used to fund projects aimed at reducing air pollution throughout Israel, to raise public awareness about the new law, and to lend support to manufacturers so that they can adjust their operations to the provisions of the new law.

0.2 PLASTIC WASTE MANAGEMENT SYSTEM AND PERFORMANCE

0.2.1 Waste collection and treatment

The collection and transport of municipal waste is organised by the local authorities. The only legal obligation for local authorities is to set up separate collection systems for packaging waste via contracting with Tamir and distribution of Orange bins (Packaging) and Purple Bins (Glass). Other streams such as Organic waste (Brown bins) and paper are voluntary (see 0.1.3). The accredited body TAMIR offers different systems to the Local Authorities, which remain responsible for the collection of the waste. Collection of municipal waste (Green bin) can be done by the Local Authorities themselves, but usually it is contracted to collection companies.

Approximately 70% of the Municipal waste that is collected is transferred to transfer stations after collection. Some of these stations sort plastic, as well as other, recyclable materials, including glass, paper, cardboard, cans, metals and organic streams. The MoEP is currently developing a Waste Data Base system to collect accurate data from all Landfills and transfer stations.

Regardless the above, more than 75 % of all municipal waste is still going to landfill, less than a quarter is currently recycled or composted. Since 1995, all uncontrolled landfills and illegal dumpsites

⁷ Source: http://www.sviva.gov.il/English/env_topics/Solid_Waste/Pages/Supermarket-Bags.aspx



were closed. Currently there are no energy recovery facilities in Israel, but the MoEP is currently planning the development of Waste to Energy Facilities for residual waste.

Currently, only 6 % (consisting in 0.06 million tons per year) of all plastic waste is recycled.

0.2.2 Future actions

During the mission, the MoEP has mentioned initiatives for several future actions that are relevant for the development of the plastic waste management system and need to be considered:

- A new National Management Plan for Solid Waste will be drafted
- New recycling targets have been set: 35 % recycling in 2020, 55 % recycling & recovery in 2030
- One or several energy recovery/waste-to-energy plants will be developed in Israel
- By 2020, the packaging law foresees a ban on landfill for all packaging, leaving only two main technical options for the treatment of plastic waste: recycling/recovery and energy recovery in special plants (incineration, waste-to-energy plants)

0.2.3 Outcome/performance of legislation

0.2.3.1 *Deposit on Beverage Containers Law and Amendment*

Since the introduction of the beverage containers deposit law, the amount of sold and collected beverage containers constantly increased. Measured in number of bottles, the annual collection and recycling rate for small beverage containers under the law is since 2011 on a constant level of around 77%.⁸ The constantly increasing target set by the law was overachieved since 2009.

However, there are several flaws in this result (see also chapter 1):

- Both the MoEP and all stakeholders confirm that there is a large number of free riders that have not registered with the system. Estimations vary, but probably around the double or triple of what is currently being accredited is actually put on the market.
- Both the target and thus also the data collection is a) not specific per each material stream and b) it applies for number of bottles collected/ number of bottles sold and not per weight or per volume. For this reason, no data is available for individual material streams such as plastic.
- In practice, a large part of the empty beverage containers are not returned via the businesses or municipal recycling stations but is collected by informal collectors, via cages for large beverage bottles, or end up in municipal waste. No data is available on this.
- No distinction is made between bottles collected and recycled.
- There does not seem to be a clear definition of recycling and all collected bottles seem to be counted also as recycled.

⁸ 2012: 77 %, 2012: 76 %, 2013: 77 %, 2014: 79 %, 2015: 76 %. Source: PPT of MoEP.



- Under the current legislation, there is a double responsibility for collection of large plastic bottles. This issue needs to be assessed, and changed accordingly.
- No information is available on the definition of recycling, one may assume that as for beverage containers under the deposit law, every tonne collected is also accounted for as recycled.

Since the set-up of the system, 230 million NIS have been put into the system, of which the end-consumer claimed back only around 2 million NIS, less than 1%.

0.2.3.2 Packaging law

Since the packaging law came into force, the respective recycling rate⁹ constantly increased. While the target for recycling is increased every year, since the introduction it has always been overachieved.

Table 0-2: Recycling rate

	2012	2013	2014	2015
Packaging waste put on the market by the contracted manufacturers and importers (in 1000 t)	300	331	343	365
Packaging waste recycled (in 1000 t)	187	209	250	295
Recycling rate	62 %	63 %	73 %	81 %
Recycling target	40 %	50 %	55 %	60 %

As explained in chapter 0.1.3, legal obligations exist for manufacturers and importers. Enforcement proceedings are continuing against manufacturers and importers who have not yet arranged for their waste to be treated. As of June 2015, enforcement has begun against 400 importers and manufacturers who've violated the law. Until now, 12 manufacturers and importers have received fines, totalling NIS 1.5 million, to be paid to the Maintenance of Cleanliness Fund.

0.2.3.3 Plastic Bag Law

In January 2017, the levy of 0.025 € was introduced on plastic bags in large supermarkets. At the same time, the MoEP distributed 6.5 million free reusable carrier bags to the general public. The early analysis shows that the new law led to a reduction of 80 % of plastic bag consumption in large supermarkets during the 3rd quarter of 2017. The income from the plastic bag levy goes to a fund managed by the MoEP. In the first quarter of 2017, 7.3 million Euro were collected.

⁹ Percentage of packaging waste recycled in relation to packaging waste put on the market by the contracted manufacturers and importers.



1. KEY PROBLEMS IDENTIFIED

1.1 STRATEGY AND INSTITUTIONAL ARRANGEMENTS

A few issues at policy and institutional level have been identified that are not beneficial to reaching higher recycling rates for plastic in Israel:

- Currently, on a national level, there is no clear commitment and long-term vision towards waste prevention, reuse, and recycling of Plastics and no ambitious and long-term strategy for recycling of plastics exists.
- There is no discussion about increasing targets in the existing Laws.
- Local Authorities are required to reach the recycling targets set by recycling law, but MoEP has not enforced this. The only requirement that the local authorities have is to report recycling and waste collection figures on an annual basis ("Form 1").
- Most Local Authorities work on their own to collect and transport waste; currently there are 5 municipal groupings (clusters) and a few other organisational structures (Such as Municipal Corporations) in which neighbouring Municipalities contract together in organising their waste management system and thus profit from an economy of scale effect. MoEP is promoting the development of more clusters that will map the whole country.
- No Environmental Agency exists on a national level – an institution that exists in most EU member states and that contributes substantially to a successful implementation of the national strategy and targets, and that can also help in data collection, monitoring and control.
- Even though the MoEP wants to move away from landfill, still the largest part of municipal waste goes to landfill. Landfilling is still an affordable option for most local authorities, since the Landfill Tax is still relatively low (see chapter 0.1.2). The landfill tax was introduced in 2007, and was gradually raised until 2015. There has been some discussion in MoEP about raising the landfill tax but there is resistance from the local authorities. Regardless, landfill capacity is very limited and currently, the landfill space available in planning permits will run out by 2024.
- There seems to be a lack of sufficient treatment facilities (sorting plants, anaerobic digestion and composting plants, waste-to-energy plants). Finding spots for new plants is difficult due to the limited land available in the country.

1.2 COLLECTION SYSTEM

In order to move towards higher recycling rates, the collection system needs to be well set up and well-functioning. Several issues have been identified in the current collection system:



- The legal obligations for local authorities to recycle their waste and to set up separate collection systems has to be reinforced.
- Citizens are obliged to participate in separate collection system, but only for existing schemes for packaging waste.
- The Municipality taxes are generalised, and there are no “Pay As You Throw” schemes.
- The existing separate collection options do not cover the whole country. Under the current contract with Tamir, the accredited body is required to spread recycling bins for packaging waste nationwide by 2020.

1.3 DATA COLLECTION & AVAILABILITY, MONITORING & ENFORCEMENT

A substantial **lack of data collection and availability** has been identified:

- Both the MoEP and all stakeholders confirm that there are a large number of free riders that have not registered with the collection schemes for both the deposit law and the packaging law. Therefore, no accurate data exists for the total amount of plastic from packaging and plastic beverage bottles put on the market.
- The difficulty in data collection on the amount of plastic collected is due to a number of reasons:
 - Reports under the deposit law are not specific per waste stream and are furthermore collected by number of bottles instead of by weight. Therefore, no data is available on the amount of tonnes collected under the deposit law per waste stream.
 - Currently, most of the waste transfer stations are not connected to a Waste database collection system. MoEP is developing a system which should be fully operational by 2019. Analysis will be much easily undertaken then. Currently, there is no legal basis to require local authorities to connect to the Waste Data Flow System that is being developed.
 - Local Authorities are obliged to report on an annual basis to MoEP regarding waste collection and recycling streams ("Form 1"), but on average only 2/3 of them actually provide reliable data to the central administration. Data collected are not always accurate. .
 - In practice, many beverage containers under the deposit law as well as much packaging under the packaging law are collected through other schemes, such as by informal collectors, via cages for large beverage bottles, or they end up in the residual fraction of municipal waste.
 - There seems furthermore to be a strong **lack of human resources** to comprehensively monitor the compliance with the legislation and to ensure **law enforcement** at the Ministry of Environmental Protection.

The following issues of monitoring and enforcement have been identified:



- Under the deposit law, probably around the double or triple of what is currently being accredited is actually put on the market (estimations vary).
- Under the packaging law, between 500.000 and 900.000 tonnes of packaging waste are on the market that have not been registered with the system – thus 137 % - 247 % of what is currently registered in the system (estimations vary).
- Under the current legislation, there is a double responsibility for collection of large plastic bottles. This issue needs to be assessed, and changed accordingly.
- The Packaging law **bans landfilling of packaging** waste from 2020. Tamir is the responsible body ensuring **monitoring, control, and enforcement**.

1.4 PLASTIC MARKET AND ACCESS TO SECONDARY RAW MATERIAL

Four main issues have been identified regarding the plastic market and the access to secondary raw material.

- **Quantity and quality of waste collected and reliability of collection system:**
 - Low availability of material due to low separate collection → low quantities collected.
 - Low quality of material from sorting stations (mixed municipal waste).
 - The current system provides no reliability and stability for quality and quantity of secondary raw material availability to the producer.→ The above results in a lack of recycling factories in Israel.
- **Competition of virgin material to secondary raw material¹⁰:**
 - Overcapacity of virgin material at low prices.
 - Due to the high collection costs and the low costs for the virgin material, the secondary raw material is not competitive.
 - The quantity of plastic production (millions of tonnes) and the quantity of collected material (only hundreds of tonnes) are not in balance.
- **International competition to Israeli recycling companies**
 - High cost of production in Israel (also due to environmental and social standards that are not applied or enforced in the export countries) and minimum wages hinder competitiveness to export countries like Turkey or Asian countries.

¹⁰ Due to the global market, this is not a problem singular to Israel, see for example the Briefing by the European Parliament Think Tank: "Plastics in a circular economy: Opportunities and challenges". Source: http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI%282017%29603940



- A strong Shekel and a weak Euro next to other reasons lower the competitiveness to European countries.
- **Low/no demand for products with recycled content**
 - No legal or economic incentive exists to encourage the use of recycled plastics in new products.
 - Lack of information and data on products with recycled content.
 - Lack of environmental awareness in population, no demand/market pressure for sustainable products

1.5 DEPOSIT LAW AND PACKAGING LAW

During the meeting with the MoEP staff, the experts discussed the legal background of the two main laws that deal with plastic recycling. Currently, plastic packaging is not all included in one piece of legislation and regulations on beverage containers are **split between the deposit law and the packaging law**. The context in which the various pieces of legislation have developed have helped to understand its ratio and functioning. Nevertheless, one consistent legislation that covers all aspects of plastic packaging recycling and valorization would probably be more efficient.

At present, the main issues due to fragmented legislation are:

- Different organisational bodies are responsible for different types of containers. This prevents a “raw materials approach” and a benefit from an economy of scale effect when putting one material under one system.
- The consumer needs to make the difference between bottles of the same material but of different size. This can create confusion and potentially hinder consumers to sort their waste properly.
- The two systems require double organisational efforts and thus higher costs, not only in operation but also in administration, communication, etc.

For both the packaging and the deposit law it is furthermore not entirely clear **how recycling is defined**. In both cases each tonne/bottle collected seems to be accounted for as recycled but it is not clear where the material goes and if it indeed always go to recycling facilities.

Another issue identified in the **deposit law** is the **definition of the targets** for beverage bottles. Both the target and thus also the data collection is a) not specific per each material stream (glass, plastics, aluminium) and b) it applies for number of bottles collected/ number of bottles sold and not per weight or per volume. For this reason, no data is available for individual material streams such as plastic.

Targets are met for the general amount of bottles collected for recycling and are not stream and weight specific. This creates more of an incentive to collect glass bottles and aluminium cans, but less for plastic bottles.



A similar issue appears in the **packaging law**: Both the target and thus also the data collection is **not specific per each material stream**. For this reason, no data is available for individual material streams such as plastic.

1.6 ENVIRONMENTAL AWARENESS OF THE POPULATION

All stakeholders met during the study visit see a lack of environmental awareness in the population. This leads to **low participation rates** of separate collection schemes, **contamination** of separately collected streams, and a **low demand** for products (partially) made from secondary raw material. Environmental awareness, knowledge and willingness to participate in a separate collection system are key elements for the success. Information campaigns (also in schools) and financial incentives in a system (e.g. high deposits, possibility to save waste taxes by participating in a separate collection system) are important elements of an overall strategy.

One stakeholder furthermore expressed the concern that the fact that packaging material is potentially collected via five different forms can contribute to the confusion of the consumer and potentially hinder participation.



2. RECOMMENDATIONS

2.1 STRATEGY AND INSTITUTIONAL ARRANGEMENTS

- **Ambitious strategy:** The MoEP is advised to develop a long-term and ambitious strategy based on long term targets and a defined waste management that
 - Sets a clear focus on the idea of circularity of materials and that pushes up the waste hierarchy;
 - Applies more significant measures to the polluter-pays principle;
 - Targets all actors and foresees cooperation and continuous communication with them;
 - Phases out landfill and takes the relevant measures;
 - Formulates a long-term vision and sets clear targets for the next 3, 5, 10, and 20 years;
 - Foresees improvements in data collection, monitoring, and intermediate controls of progress towards the targets;
 - Foresee measures to ensure the quality and quantity of the secondary raw material and thus to provide a security for investment;
 - Foresees enforcement procedures.

By doing so, the MoEP can set a clear framework for development of the recycling market over the next 10-20 years and thus lays the basis to establish trust in the system and security of investment.

- Set up an environmental or waste agency that is responsible for the implementation and delivery of the strategy and policy set by the MoEP and enforcement of the law.
- **Clarify the responsibilities** for waste collection and sorting between the MoEP, local authorities, the EPR schemes, waste collectors, and waste treatment facilities. Ensure that each stakeholder of the value chain is aware of the responsibilities and legal obligations pushed to move towards higher rates of separate collection. High quantities and high quality of collected plastics enable the build up of a closing-the-loop system, one key element of a green economy and a higher resource efficiency.
- Include municipalities in **taking responsibility for achieving the targets** on their territory. At the same time, support cooperation between municipalities to allow for economy of scale effects when organising their waste management systems and setting up treatment facilities. Tricking down the obligation is important to make municipalities stronger actors in the waste management system with a stronger sense of responsibility but will also ensure cooperation when it comes to finding locations for new treatment plants.
- **Work out harmonized standards for the collection and sorting.**
- Work out a **balanced system**, that includes standards and allows **necessary local adaption** (e.g. for big cities, villages, etc.)



- Encourage and help in **forming of more municipality clusters**, until the whole country is mapped, to allow for economy-of-scale effects in procurement.
- **Cooperation**: Formation of a consortium of the whole plastic value chain (local authorities, collectors, recyclers, plastic industry, the EPR systems and the MoEP) to develop solutions.
- Make the costs of waste management visible to the citizen by obliging municipalities to decouple the **waste tax** from the general tax.
- Apply the polluter-pays principle to citizens by elaborating and introducing a sort of **pay-as-you-throw system**
- **Definitions and quality standards**: Legal definition of recycling and clear quality standards of when a material is considered recycling.
- **Support the Design-for-recycling** principle. This enables industry getting closer to a cradle-to-cradle approach.
- Some stakeholders have furthermore suggested a ban on the export of recyclable materials. While this measure would indeed ensure that secondary raw material stays in the country and needs to be treated domestically, this violates the principles of a free market. Putting up such a ban is thus a highly political decision.

2.2 RECYCLING TARGETS, COLLECTION SYSTEM & TREATMENT OPTIONS

- **Set ambitious recycling targets in the laws** for individual material streams, targets that increase over time and don't allow standstills. Contrary to what is currently envisaged it is furthermore essential to propose specific recycling targets (material recycling) as the more valuable procedure in the 5-step-waste hierarchy. The European Waste Framework Directive (WFD) targets and the European Packaging Directive targets, still in amendment process, could be of inspiration.
- Reinforce the **separate collection obligatory systems (packaging/ deposit)** for both local authorities and take more measure to educate the citizens to collect separately at source.
- Some stakeholders had suggested abolishing separation at source and to rely fully on separation of streams at the sorting stations. We would strongly advice not to follow this suggestion. Even if sorting stations claim that they can achieve terrific results, decades of practice have shown that this is not the case. The output of recyclables usually shows much lower quality and to some extent also smaller quantity. The plastic streams are affected by the glass crushed in trucks, the organic content and through the sorting process. Very fine fractions are lost to recycling and contaminate plastic, while contamination is taking place through contact with organic and other wet waste (e.g. paper).
- If the MoEP is aiming for quality recycling of all recyclables fractions then a separation at source for most fractions is the way to go. Because in many cases the separation will continue to be



very difficult, a balanced system of separate and non-separate collection is needed, adapted to the specific local context.

- **Collect all plastics together (not just bottles or packaging).** A recommended collection method common in European countries is the recyclable bin.
- Define a **standardised sorting process** that includes the sorting into four different types of plastic. High quality of collection and sorting will ensure a high quality and clean stream of secondary raw material, which should then lead to a price increase for secondary raw material not very considerably inferior to virgin material.
- Clarify the legal situation on the **landfill ban for packaging** in 2020 (who is responsible) and ensure **monitoring, control, and enforcement**.
- While waste-to-energy (WtE) could be probably be part of the solution, **investment in waste-to-energy** needs to be **carefully thought** through:
 - Consider that all incineration processes produce 15-30 % ashes that then still need to be disposed of, usually on landfills or as street fillers;
 - Consider the high amount of wet organic waste in the residual fraction and the efficiency of burning this wet fraction;
 - WtE is an expensive technology: once the investment is made the plants have to be supplied with a regular input flow which can come into conflict with goals for increasing separate collection and recycling;
 - While WtE technologies have been applied in most European countries, in some cases there has been failure. The adaptation to the local context, the economic viability of WtE facilities and choosing the right technology need to be ensured before development :
 - It seems that there will be no use for the heat produced by WtE plants in Israel due to the climate, unless it can be utilised by the industry, leaving electricity to be the only option for energy recovery.
 - Be careful with the capacity planning for incineration since an overcapacity can potentially stop all process in recycling, as can be seen by several examples in Europe. This should not be a problem for the first 2-3 WtE facilities in Israel.
 - Local Authorities must be engaged and committed to a WtE facility to ensure feedstock.
 - Phasing-out landfill by putting up a landfill ban or by drastically increasing the landfill tax.

2.3 DATA COLLECTION AND AVAILABILITY, MONITORING AND CONTROL

- Improve data collection and monitoring, including also weight/volume (e.g. of tonnes of beverage containers and packaging) put on the market. A separate research platform may offer some advantages compared to estimates or self-reporting.



- Systematic collection of data on municipal waste produced, collected, and finally recycled (for each municipality):
 - Residual waste
 - Recyclables in residual waste, (split by material stream)
 - Recyclables collected separately, (split by material stream)
- Strengthen the team for law enforcement of the existing legislation and reduce significantly the number of free riders in the EPR systems. When expanding legislation, ensure availability of adequate enforcement mechanisms to maintain credibility and drive transparency and progress.

2.4 PLASTIC MARKET AND ACCESS TO SECONDARY RAW MATERIAL

- Take up measures that **give plastic as a second material a value**, for example by:
 - Allowing the issuance of CO₂ emission reduction certificates for recyclates or high-energy consuming recycling industry
 - Tax reduction for products with recycled content (bottle-to-bottle and similar)
 - Bonus/malus system for the fees for producers to the EPR schemes, based on the actual recyclability of packaging/products in the existing infrastructure
 - Rethinking packaging solution in communication with producers, recyclers and retailers
 - Aligning with the retailers and use their market pressure to move towards recycling
 - Increase information and communication on the environmental impact on recycling and the benefits of recycled products and support thus movements of consumer pressure
 - Finding niches where specific needs can be satisfied (specialisation)
 - Setting a requirement of a minimum level of recycled content in certain new products put on the market
 - Set up financial incentive systems supporting the secondary raw material market, e.g. Incentives for public procurement, etc. for products including recyclates.

2.5 EPR SYSTEMS

- Put all products of the same material/type under one EPR system (deposit law or packaging law) or set up separate EPR schemes for each type of material (paper packaging, glass packaging, etc.). Having the same material depending on the type of container under either the deposit or the packaging law can reduce synergies and economies of scale and can create further problems (see also chapter 1.5).



- Introduce the full cost-coverage principle for each EPR system: cost of collection, sorting, recycling/recovery, investments, and communication.
- Set up a clearing house with experts for enforcements; paid by the producers but under supervision of an EPA or the MoEP directly.
- Collaborate with ambitious producers on new products and the necessary improvements of collection and sorting.
- Consider the introduction of a bonus/malus system for the fees for producers to the EPR schemes, based on the recyclability of packaging in the existing infrastructure.
- Introduce clear quality standards for recycling and ensure that all tonnes claimed as recycled fulfil the standards.
- For the Deposit law, set the targets per material stream individually.
- Consider increasing the amount for the deposit for small beverage bottles, and set a deposit for large bottles (compulsory).

2.6 ENVIRONMENTAL AWARENESS OF THE POPULATION

Education for Sustainable Development focussing on material streams and avoidance of excessive use of plastic and communication campaigns are essential tools that are often decisive about the success of a change in the collection system.

- Include the costs for education and communication campaigns in the EPR systems and have them thus covered by the producer. While there should be some budget allocated to national campaigns, parts of the budget will go to communication on the local level. For these local communication campaigns, public authorities in cooperation with SCOs can stay responsible. In Germany for example, the Producer Responsibility Organisations (PROs) pay 20 million Euros to the municipalities each year for the communication campaigns, many of which are carried out by NGOs. While covering the full cost, the PROs have no influence on the content. However in most cases, and this is recommended, there is a strong cooperation in order to make sure that the right messages are underlined.
- Consider providing further support to municipalities for education and communication campaigns.
- Consider investing in a strong country-wide education and communication campaign at the point of introduction of new ambitious recycling targets and/or a change of the collection system.
- Be very careful with changes in communication: differing instructions to the consumer from one day to another won't work.
- Make the system transparent and show the citizens the efforts put into increasing the recycling.
- Utilise existing expertise on the issue, in regional networks, e.g. MEdIES. Link formal, non-formal and informal Education awareness campaigns with the Mediterranean Strategy on ESD and activities of the Ministry of Education.



- Don't underestimate investment in education and communication, especially at the beginning. Every Shekel invested at the beginning of a campaign will bring benefits for a long time.



3. FEEDBACK FROM KEY STAKEHOLDERS

During the mission the experts had the chance to meet a range of key stakeholders and discuss the plastic waste management system in Israel with them. While having included the results from these meetings already in the analysis here above, you will furthermore find here in annex you will find a set of factsheets, one for each of the key stakeholders (in order of agenda). These factsheets give a short description of the stakeholder and highlight the main problems mentioned and key recommendations given.

- Annex I: The Manufacturers Association of Israel
Contact person: Osnat Avital, Environmental Coordinator
- Annex II: Green-Net Sorting Station
Contact person: Offer Bogin, CEO
- Annex III: Green Point Recycling Co.
Contact person: Zohar Levy, CEO
- Annex IV: TAMIR – Packaging Accredited Body
Contact person: Kobi Dar, CEO
- Annex V: Aviv Recycling Industries Ltd.
Contact person: Yaron Mizrachi, Vice President
- Annex VI: Danieli Environment
Contact person: Avi Uzana, CEO
- Annex VII: Infimer Technologies Ltd.
Contact person: Yuval Tamir, CEO
- Annex VIII: K.B. Recycling Industries Ltd.
Contact person: Ami Krupik, CEO