ANALYTICAL ANNEX
TO THE NATIONAL STRATEGY FOR THE TRANSITION TO A CIRCULAR MUNICIPAL WASTE MANAGEMENT SYSTEM IN ISRAEL

This analytical annex complements the Strategy and provides the expanded international and national context on the basis of which the objectives, tasks, and instruments for the transition to a circular municipal waste management system in Israel were formulated. The annex includes:
• a detailed review of international frameworks (the UN Sustainable Development Goals, the EU Circular Economy Action Plan, Zero Waste initiatives, and C40);
• the evolution and current structure of Israeli legislation and policy in the waste sector;
• key findings of governmental and independent assessments;
• a consolidated list of sources and cases referenced in the analytical part.

1. International context: SDGs, the EU circular economy, and best practices of cities

2. International context: Sustainable Development Goals, the EU circular economy, and best practices of cities
   The beginning of the 21st century was marked by global recognition of the inadequacy of the linear economic model “extract–produce–discard” that dominated the industrial era. This model, based on continuous extraction of primary resources, their single use, and subsequent disposal in landfills or incineration, has led to multiple interrelated crises: depletion of natural resources, ecosystem degradation, biodiversity loss, accumulation of persistent pollutants in the environment, and, most acutely, anthropogenic climate change. In response to these existential challenges, the international community has developed a new paradigm of sustainable development закрепленную in several key international frameworks and

initiatives.

The United Nations Sustainable Development Goals (SDGs). In 2015, the United Nations General Assembly adopted the “2030 Agenda for Sustainable Development,” which includes 17 Sustainable Development Goals (Sustainable Development Goals, SDGs) (United Nations, 2015). These goals represent a global consensus and an action plan to ensure peace and prosperity for people and the planet. For the waste management sector, the most relevant are:

SDG 11 (Sustainable Cities and Communities): calls for making cities and human settlements inclusive, safe, resilient, and sustainable. Target 11.6 specifically aims to reduce the negative environmental impact of cities, including by improving waste management and ensuring access to safe and inclusive green spaces.

SDG 12 (Responsible Consumption and Production): is central to the waste theme. Target 12.3 calls by 2030 to halve per capita global food waste at the retail and consumer levels and to reduce food losses along production and supply chains. Target 12.5 provides for a substantial reduction of waste generation through prevention, reduction, recycling, and reuse.

SDG 13 (Climate Action): is directly linked to waste management, since landfills are a significant source of methane (CH_4) emissions, which account for about 20% of global anthropogenic greenhouse gas emissions (IPCC, 2021).

The EU Circular Economy Action Plan. The European Union has positioned itself as a global leader in the transition to a circular economy. In March 2020, the European Commission adopted a new Circular Economy Action Plan (Circular Economy Action Plan, CEAP), which is one of the key elements of the European Green Deal —an ambitious strategy to achieve climate neutrality by 2050 (European Commission, 2020). CEAP is a comprehensive transformation program that goes far beyond traditional waste management and focuses on redesigning the entire economic system. The conceptual foundation of the circular economy, as articulated by the Ellen MacArthur Foundation, is built on three fundamental principles: (1) design products and systems in such a way as to

eliminate waste and pollution from the outset; (2) keep products and materials in use at their highest possible value; (3) regenerate natural systems rather than deplete them (Ellen MacArthur Foundation, 2019).

CEAP sets a number of specific and measurable targets. One of the central ones is doubling the EU "circularity rate"—the share of material that recirculates in the economy after recycling—from the current approximately 12% to 24% by 2030. For municipal waste, progressive recycling targets are set: 55% by 2025, 60% by 2030, and 65% by 2035. In parallel, the plan provides for a dramatic reduction of landfilling to a maximum of 10% by 2035, which represents an almost complete phase-out of this practice.

The plan also focuses on specific product value chains with high circularity potential and a significant environmental footprint: electronics and WEEE (Waste Electrical and Electronic Equipment), textiles, packaging, batteries and vehicles, plastics, construction and demolition, food and bio-waste. Targeted strategies are developed for each of these chains. For example, for textiles, a mandatory separate collection system is introduced by January 2025, with the perspective that by 2030 all textiles on the EU market will be durable, easy to recycle, and predominantly made from recycled fibers (European Commission, 2022).

A key instrument of CEAP is the Sustainable Product Policy Framework, which seeks to make sustainable products the norm. The central element of this framework is the Ecodesign for Sustainable Products Regulation (Ecodesign for Sustainable Products Regulation, ESPR), which extends ecodesign requirements beyond energy consumption to criteria of durability, reparability, upgradability, and recyclability. In addition, the Right to Repair Directive expands consumer rights, making repair more accessible and economically attractive, while the Green Claims Directive is aimed at combating "greenwashing" by requiring companies to substantiate their environmental claims (European Commission, 2023).

City leadership: the Zero Waste movement and the C40 Cities network. While national and supranational policies set the

frameworks, it is often cities that serve as laboratories of innovation and drivers of real change. Two global urban movements—Zero Waste Cities and the C40 Cities Climate Leadership Group—demonstrate the transformational potential of municipal leadership.
The Zero Waste Cities movement, supported by Zero Waste Europe, brings together municipalities that have committed to rethinking the entire resource management system in such a way as to systematically avoid and eliminate the volume and toxicity of waste (Zero Waste Europe, 2023). The "zero waste" philosophy is based on the principle that waste is not an inevitable by-product of human activity, but the result of shortcomings in product design, consumption systems, and infrastructure. Cities such as San Francisco (USA), Ljubljana (Slovenia), and Kamikatsu (Japan) have become pioneers of this approach, achieving waste diversion rates above 80%.
San Francisco, which adopted a mandatory recycling and composting ordinance in 2009 (Mandatory Recycling and Composting Ordinance), achieved a landfill diversion rate of around 80% as early as 2012, which is the highest показатель among major U.S. cities (City of San Francisco, 2020). Ljubljana, the first EU capital to officially adopt a zero waste goal, reduced the volume of waste sent to landfilling by more than 90% and achieved a recycling rate of 68% through a combination of mandatory door-to-door separate collection, a network of reuse and repair centers, and a large-scale educational campaign (Zero Waste Europe, 2019). Kamikatsu, a small Japanese town, went even further by requiring residents to sort waste into 45 different categories, which made it possible to reach a recycling rate of more than 80% and to virtually eliminate the need for incineration or landfilling (Kamikatsu Zero Waste Academy, 2020).
The C40 Cities Climate Leadership Group is a network of nearly 100 mayors of the world's largest cities that have committed to taking urgent action to address the climate crisis (C40 Cities, 2023). C40 explicitly recognizes the critical link between waste management and greenhouse gas emissions, indicating that sustainable waste management can help cities reduce their overall emissions by 15–20%, and in some Global South cities—even by 35%. The main

reason is methane, produced during anaerobic decomposition of organic waste in landfills. Methane has a global warming potential 87 times higher than CO_2 over a 20-year time horizon, making it an extremely powerful, though short-lived, driver of climate change (IPCC, 2021).

To address this problem, C40 has launched several targeted initiatives. The "Towards Zero Waste Accelerator" brings together predominantly Global North cities that commit to reducing municipal solid waste generation per capita by at least 15% and diverting at least 70% of waste away from landfilling and incineration by 2030. Participants include New York, Paris, Tokyo, London, and Copenhagen (C40 Cities, 2021). The "Sustainable Waste Systems Accelerator" focuses on Global South cities such as Accra, Buenos Aires, and Nairobi, where organic waste often constitutes a larger share of the waste stream and collection services may be incomplete. These cities commit to ensuring waste collection across the entire city, treating at least 30% of organic waste, and reducing emissions from waste disposal by at least 30% by 2030 (C40 Cities, 2023).

These international frameworks—the UN SDGs, the EU CEAP, and urban initiatives—form the global context in which Israel must rethink its waste management system. They demonstrate that transformation is not only necessary but also achievable, providing tested strategies and target indicators that can be adapted to the Israeli context.

1.1. Why the EU experience cannot be mechanically transferred to Israel

Even though the EU regulatory frameworks on waste management and the circular economy are an important reference point for Israeli policy, direct copying of European solutions without adaptation to the local context is impossible and undesirable.

First, the institutional capacity of municipalities and regulators in most EU countries is substantially higher than that of the average Israeli local authority. European cities have for decades developed competencies in tariff policy, long-term infrastructure planning, contract management, and oversight. In Israel, many municipalities have limited staffing and analytical

capacity and depend on short-term political cycles.
Second, the construction of waste management infrastructure facilities in Israel faces much higher levels of conflict than on average in the EU. This is influenced by high population density, political and national-ethnic sensitivity around the siting of “undesirable” facilities, as well as the need to take into account security issues and military infrastructure.
Third, land scarcity and competition for territory in Israel are significantly more stringent than in many European countries. Lands potentially suitable for the siting of landfills, recycling complexes, and WtE facilities are simultaneously considered as reserves for housing, transport, industry, military needs, and protected natural areas.
Fourth, a significant volume of “grey” and illegal waste streams (unlicensed transport, illegal dumps, open-air burning, informal recycling) makes the simple transfer of European control and reporting mechanisms ineffective. The reform must take into account the need to legalize and integrate part of existing practices into the formal sector, as well as to strengthen control and sanctions where this is impossible.
Therefore, even while preserving European target benchmarks (65% recycling, ≤10% landfilling, etc.), Israeli policy must proceed from adapting instruments to the political, institutional, and territorial особенностям of the country, rather than from mechanical transfer of European solutions.

1.2. Which countries and cities are closer to Israel by context
To define realistic scenarios for waste reform, it is useful to orient not only toward EU leaders, but also toward countries and cities that are closer to Israel in demographic, territorial, and political-economic characteristics. Such comparable contexts can include:
• certain regions of Southern European countries (Italy, Greece, Spain, Portugal), where rapid growth of urbanization and tourism, land scarcity, a significant role of the informal economy, and high conflict around landfills and incineration facilities are combined;
• certain U.S. cities and regions, especially large metropolitan areas with high levels of conflict around landfills and WtE (Los Angeles, New York, etc.), where a developed “green” sector and strong resistance to any “dirty” facilities coexist;

• OECD countries outside the EU with rapid growth and limited land resources (for example, some countries of Latin America) that are attempting to synchronize waste reform with the climate and social agenda. In this sense, Israel can be seen as a “hybrid case”: a small high-income state with an education and technological development level comparable to Europe, but with institutional and territorial constraints closer to Southern European and some Latin American contexts. Accordingly, international experience is used not as a template for copying, but as a set of instruments and approaches requiring adaptation.

2. Israeli context: evolution of legislation and key assessments

3. Israeli context: existing laws, reports of the Ministry of Environmental Protection and the State Comptroller
   In contrast to ambitious international trends, the Israeli municipal waste management system remains deeply rooted in an outdated landfill-based paradigm. Understanding the current situation requires a detailed review of the existing legislative base, assessments by governmental and independent bodies, as well as identification of systemic failures that have led to the current crisis.
   Evolution of the legislative base. The legal foundation for waste management in Israel has developed gradually over the last four decades, reflecting the growth of environmental awareness and state attempts to regulate the sector.
   The Maintenance of Cleanliness Law (Maintenance of Cleanliness Law, 1984) is the foundational act that laid the basis of the modern system. This law established the basic principle that it is illegal to dispose of waste in public places and that local authorities are responsible for organizing the collection and removal of waste generated within their territory. Critically, the law also established the Maintenance of Cleanliness Fund—a special financial mechanism intended to accumulate resources for environmental protection, waste management, and the promotion of recycling (Alon Environmental Group, 2023).
   A decade later, the Recycling Law (Recycling Law, 1993) established more direct requirements for promoting recycling. It required local

authorities to allocate land plots for the creation of recycling centers and to install specialized containers for separate waste collection. The law also imposed on property owners the obligation to install and maintain recycling infrastructure. Regulations of 1998 further required local authorities to report waste quantities, which was intended to enable the establishment of mandatory recycling targets (Alon Environmental Group, 2023).

An important step toward the “polluter pays” principle was the Deposit Law on Beverage Containers (Deposit Law on Beverage Containers, 1999). This law introduced a deposit system for most types of beverage containers, under which consumers pay a small deposit upon purchase and can reclaim it by returning the empty container. The law also required producers and importers to annually collect and recycle at least 90% of the collected containers through licensed enterprises (Alon Environmental Group, 2023). This was the first application of the concept of Extended Producer Responsibility (Extended Producer Responsibility, EPR) in Israeli legislation.

The Packaging Law (Packaging Law, 2011) significantly expanded the application of EPR by placing direct responsibility for packaging waste management on producers and importers that place packaging on the market. They are required to annually report the weight of packaging placed on the market and to finance its collection and recycling. The law was intended to stimulate reductions in packaging volumes, encourage reuse, and stimulate the development of a domestic recycling industry (Alon Environmental Group, 2023).

Additional laws applied the EPR principle to other problematic streams: the Tire Recycling Law (Tire Recycling Law, 2007) and the Law for the Environmental Treatment of Electrical and Electronic Equipment and Batteries (Law for the Environmental Treatment of Electrical and Electronic Equipment and Batteries, 2012) (Alon Environmental Group, 2023).

In 2007, an important economic measure was introduced—the landfill levy (landfill levy) through an amendment to the Maintenance of Cleanliness Law. This levy requires landfill operators to pay for each tonne of accepted waste. The main purpose is to internalize the

external environmental costs of landfilling, making it a less economically attractive option and creating a financial incentive for local authorities and enterprises to invest in alternatives such as recycling and recovery. Revenues from this levy are directed to the Maintenance of Cleanliness Fund and are intended to be used to support recycling projects and other environmental initiatives (OECD, 2023).

Assessments by governmental and independent bodies. Despite the existence of this seemingly comprehensive legislative base, the actual state of the waste management system in Israel remains critical, which is confirmed by a series of alarming reports.

The Ministry of Environmental Protection (Ministry of Environmental Protection, MoEP) is the main governmental body responsible for formulating national waste policy, developing legislation, and ensuring compliance. MoEP has developed strategic plans such as the Master Plan for Sustainable Solid Waste Management, which sets long-term goals for the sector. In recent years, MoEP has acknowledged the severity of the crisis and presented a new waste management strategy aimed at dramatically reducing the share of waste sent to landfilling, from the current 80% to approximately 20% within a decade (Ministry of Environmental Protection, 2021). This strategy includes key initiatives: introduction of a fee system based on the volume of waste generation ("pay-as-you-throw," Pay-As-You-Throw, PAYT), increasing recycling capacity, strengthening public education, and encouraging the development and deployment of new waste management technologies. However, critics note that similar ambitious statements were made previously but were not implemented due to insufficient funding, political will, and lack of accountability.

The harshest and most systematic criticism is contained in the reports of the State Comptroller of Israel (State Comptroller)—an independent body that audits government agencies. The 2022 State Comptroller report on waste management was particularly alarming, characterizing the situation as a "severe crisis" and warning that Israel is on track to exhaust all approved landfill capacity within three to four years (State Comptroller, 2022). According to the report's data,

in 2020 only 14.41 million metric tonnes of capacity remained, and five landfills were scheduled to close as early as 2022. At the same time, waste generation continues to grow by 2.6–5% annually, creating an inevitable disposal crisis in the near future.

The report also identified serious failures in implementing existing regulations. Recycling targets are not being met, economic instruments such as the landfill levy remain ineffective due to too low a rate, and the promised sorting and recycling infrastructure has not been built at the necessary scale. The State Comptroller also drew attention to the problem of regional inequality: 68% of all of Israel's waste is landfilled in the southern region, while in 2020 the southern region received 3.15 million out of 4.66 million metric tonnes of waste generated nationwide (State Comptroller, 2022). This creates a disproportionate environmental and social burden for communities in the southern region. Moreover, the report found that the quality of waste management services in non-Jewish localities is often inferior to that in Jewish localities, indicating systemic social inequality in access to basic infrastructure.

The Organisation for Economic Co-operation and Development (OECD) conducted an Environmental Performance Review of Israel in 2023. The review identified waste management and the transition to a circular economy as key areas requiring significant improvement (OECD, 2023). OECD noted Israel's high greenhouse gas emissions from waste (8% of total national emissions, significantly higher than the OECD average of 3%) and the continuing dependence on landfilling. OECD recommendations included strengthening economic instruments (raising the landfill levy, introducing PAYT), improving regional cooperation in waste management, and full adoption of the circular economy model at the national level.

An authoritative voice in the Israeli academic and policy landscape is the Samuel Neaman Institute at the Technion. In 2022, the Institute published a comprehensive analysis of the waste management crisis, in which it formulated a set of transformational recommendations (Samuel Neaman Institute, 2022). The main recommendation is to declare waste management a national project, giving it the status and

political weight necessary to bring together all relevant stakeholders and allocate a sufficient budget. A central element of the Institute's proposal is the creation of a specialized National Waste Management Authority, analogous to Israel's successful Water Authority. This body should centralize planning, oversee policy implementation, ensure compliance with standards by local authorities, and manage the development of the national infrastructure network.

To address the financing problem, the Institute proposed a closed market funding model (closed market funding model), in which all revenues from fees and taxes related to waste are collected by regional waste management corporations and reinvested directly into waste reduction campaigns and the construction of treatment facilities, instead of flowing into the general state budget. This would create a self-sustaining financial ecosystem for the waste sector.

The Bank of Israel (Bank of Israel) also contributed to the analysis, noting that municipal waste volume per capita in Israel is among the highest in developed economies and that there is a clear correlation between income and waste generation (Bank of Israel, 2020). The Bank recommended indexing landfill taxes to average national income to prevent erosion of their effectiveness due to inflation, introducing differentiated landfill taxes depending on the income level of local authorities, and expanding taxes to other problematic waste categories such as single-use plastic.

2.1. Landfill levy (Landfill Levy)

Economic instruments are central elements of modern waste management policy, intended to create financial incentives for desired behavior and disincentives for undesired behavior. Israel has introduced several such instruments, but their effectiveness has proved limited, which is revealed through detailed analysis.

2.1. Landfill levy (Landfill Levy)

Description and objectives. The landfill levy was introduced in 2007 through an amendment to the Maintenance of Cleanliness Law. This levy requires landfill operators to pay the state a specified amount for each tonne of waste accepted for landfilling (Alon Environmental Group, 2023). The theoretical justification for the levy is based on the principle of internalizing external costs: landfilling creates significant negative externalities for society (groundwater pollution, greenhouse gas emissions, air pollution, loss of land resources, aesthetic degradation), but these

costs are traditionally not reflected in the price of the service. The levy is intended to “embed” these environmental and social costs into the cost of landfilling, making it a less economically attractive option and thereby creating a financial incentive for municipalities and enterprises to seek alternatives such as reduction, recycling, and recovery. Revenues from the levy are directed to the Maintenance of Cleanliness Fund, which, according to the design, should use these funds to finance recycling projects, the construction of infrastructure, and educational campaigns (Alon Environmental Group, 2023).

Effectiveness assessment. Despite the sound logic, the effectiveness of the landfill levy in Israel has been substantially limited by two key factors:

(a) Low levy rate. The Organisation for Economic Co-operation and Development (OECD), in its Environmental Performance Review of Israel 2023, explicitly noted that the cost of landfilling in Israel remains one of the lowest among member countries (OECD, 2023). By comparison, in some European countries with high recycling rates, such as the Netherlands and Belgium, the landfill levy can reach EUR 100–130 per tonne, whereas in Israel it is significantly lower. With a low rate, the levy does not create a sufficiently strong economic signal to change behavior. For a municipality or enterprise, it may still be cheaper simply to pay the low levy and continue landfilling than to invest in the construction of costly infrastructure for separate collection, sorting, and recycling.

(b) Problems with earmarking of revenues. Although revenues from the levy are formally directed to the Maintenance of Cleanliness Fund, there are critical remarks as to how effectively and quickly these funds are reinvested in the waste management sector. The Samuel Neaman Institute and other experts point to a lack of transparency and to the fact that the Fund’s resources are not used optimally for building critically needed infrastructure (Samuel Neaman Institute, 2022). Funds may be delayed in bureaucratic procedures or redirected to other priorities within the general budget, rather than directly and immediately financing waste prevention and recycling projects.

Reform recommendations. To turn the landfill levy into an effective policy-change instrument, it is necessary to:

Substantially increase the levy rate to a level that makes landfilling significantly more expensive than recycling and other alternatives. The Bank of Israel recommended indexing the levy to average national income or inflation so that its real value is not eroded over time (Bank of Israel, 2020).

Consider differentiated levy rates depending on the type of waste (a higher levy on easily recyclable materials such as plastics and paper; possibly a lower levy on unavoidable residues after maximum recycling) or depending on the economic status of the municipality.

Ensure full transparency and accountability in the use of levy revenues by establishing clear rules that the Fund’s resources must be used exclusively to finance circular economy infrastructure, support waste prevention initiatives, and educational programs.

2.2. Extended Producer Responsibility (Extended Producer Responsibility, EPR)

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Description and principles. Extended Producer Responsibility (EPR) is an environmental policy approach that shifts responsibility for end-of-life product management from municipalities (and, therefore, taxpayers) to producers—manufacturers, importers, and, in some cases, retailers of the product (OECD, 2016). The core principle of EPR, first formalized in Sweden in the 1990s, is

that producers are in the best position to control the entire life cycle of their products and therefore should bear financial and/or physical responsibility for their collection, recycling, and final disposal after consumers have finished using them (OECD, 2016).

By internalizing waste management costs into the price of the product, EPR creates a powerful market incentive for producers to design products so that they are more durable, repairable, easy to disassemble, and recyclable, and also contain fewer hazardous substances. This is known as "Design for Environment" (Design for Environment, DfE) or "ecodesign." EPR also helps create a stable and predictable source of financing for collection and recycling systems, reducing the burden on municipal budgets.

Implementation of EPR in Israel. In Israel, EPR has been implemented through several laws, each targeting specific product categories:

(a) Deposit Law on Beverage Containers (1999). This law introduced a deposit-return system for most types of beverage containers (plastic bottles, glass bottles, metal cans). Consumers pay a small deposit when purchasing a beverage and can reclaim it by returning the empty container to a store or a specialized machine (reverse vending machine). Producers and importers bear financial responsibility for creating and operating the collection system and are required to achieve a recycling target of at least 90% of collected containers through licensed enterprises (Alon Environmental Group, 2023). This system is one of the most successful examples of EPR in Israel, ensuring a high return and recycling rate for beverage containers.

(b) Packaging Law (2011). This law significantly expanded the application of EPR, covering all types of packaging placed on the Israeli market. Producers and importers are required to annually report the weight of packaging they sell and to finance its collection and recycling. They may fulfill this obligation individually or, more commonly, collectively by creating or joining a Producer Responsibility Organization (Producer Responsibility Organization, PRO) (Alon Environmental Group, 2023). The PRO collects fees from its member producers and uses these funds to finance contracts with municipalities or private operators for the organization of packaging collection, sorting, and recycling.

(c) Tire Recycling Law (2007) and the Law for the Environmental Treatment of Electrical and Electronic Equipment and Batteries (2012). These laws apply EPR to tires, electronics (WEEE), and batteries, requiring producers to finance and organize collection and recycling systems for these problematic streams (Alon Environmental Group, 2023).

Effectiveness assessment and limitations. While the introduction of EPR in Israel was an important step forward, implementation faces a number of problems:

(a) Insufficient stimulation of ecodesign. Existing EPR schemes in Israel mainly focus on the collection and recycling of waste after it has been generated, but do not create sufficiently strong incentives for producers to change the design of their products and packaging at the design stage. Most EPR systems use flat fees based simply on packaging weight, without taking into account recyclability, recycled content, or reusability. This means that a producer pays the same amount per kilogram for an easily recyclable single-material PET plastic bottle and for a kilogram of multi-layer composite packaging that is practically impossible to recycle. Without differentiated, eco-modulated fees (where "green" packaging is charged a lower fee and "bad" packaging a higher fee), the incentive for ecodesign remains weak (OECD, 2016).

(b) Transparency and accountability of PROs. The activities of producer responsibility organizations must be fully transparent to ensure that funds collected from producers are indeed

used effectively to create and support collection and recycling infrastructure. There are concerns that in some cases PROs may operate more as financial intermediaries charging high administrative fees than as active drivers of circular infrastructure development. Strict independent auditing and regular public reporting are needed on how much money is collected, how it is spent, what volumes of material are actually collected and recycled, and what share of costs is administrative (OECD, 2016).

(c) Lack of emphasis on reuse. Existing EPR systems in Israel are focused almost exclusively on recycling, which is lower in the waste hierarchy than reuse. EPR systems should actively stimulate and finance reusable packaging and product systems (for example, refillable beverage bottles, food containers, packaging return systems) that make it possible to avoid waste generation altogether (Ellen MacArthur Foundation, 2019).

(d) Insufficient linkage to the development of a domestic recycling industry. Part of EPR funds should be purposefully invested in establishing and upgrading recycling facilities within Israel to create a closed domestic market for secondary raw materials and not depend on exporting collected materials to international markets, which can be volatile (OECD, 2023).

Recommendations for EPR reform:

Introduction of eco-modulation of fees: The size of the producer fee must directly depend on the environmental characteristics of the packaging/product, including recycled content, ease of recycling, reusability, and the presence of hazardous substances. Packaging that is easy to recycle and contains a high percentage of secondary materials should be subject to a minimal or zero fee; non-recyclable packaging—to a high, nearly prohibitive fee.

Setting reuse targets: EPR systems must be responsible for achieving not only recycling targets, but also targets for the share of reusable packaging/products on the market.

Increasing transparency: Mandatory regular publication of detailed PRO financial reports with a breakdown of revenues and expenditures, including the shares directed to infrastructure, education, and administration.

Redirecting part of EPR funds to the Circular Fund: A defined percentage (for example, 10–15%) of EPR fees should be directed to a dedicated Circular Fund to finance waste prevention initiatives, support sharing practices, and other measures that are higher than recycling in the hierarchy.

2.3. Deposit (deposit-return) programs

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Description and mechanism. A Deposit-Return System (Deposit-Return System, DRS) is a form of EPR in which consumers pay a small, fully refundable deposit when purchasing a product (usually a beverage in a container) and receive this deposit back by returning the empty container to a designated collection point (store, reverse vending machine). This creates a direct financial incentive for consumers to return the packaging rather than discard it (OECD, 2016).

Implementation in Israel. The Israeli deposit program introduced by the 1999 law covers most single-use plastic and glass beverage bottles and metal cans with volumes from 100 ml to 5 liters. The deposit amount varies depending on the type and volume of the container, but usually ranges from NIS 0.1 to 0.3 (Alon Environmental Group, 2023). Returns can be made in stores where the purchase was made or, more conveniently, via automated reverse vending machines (reverse vending machines) installed in supermarkets and shopping centers.

Effectiveness assessment. The deposit program for beverage containers is one of the most

successful elements of the Israeli waste management system. The program achieves a high container return rate, ensuring that a significant share of this fraction is diverted from the mixed waste stream and directed to recycling. International experience shows that well-organized DRS can achieve return rates of 90–98%, as in Germany and Scandinavian countries (OECD, 2016). The deposit-return mechanism also has important social and educational effects: it creates a visible and immediate link between purchase, use, and proper disposal of a product; makes recycling financially advantageous and convenient; and forms among citizens, including children, the habit of returning packaging.

Limitations and opportunities for expansion. Despite its success, the Israeli deposit program has a number of limitations:

(a) Limited scope of items. The program covers only beverage containers. Significant packaging categories that could also benefit from a deposit system remain outside it: glass bottles for wine and spirits, metal aerosol cans, some types of plastic food packaging. International experience demonstrates the possibility of expanding deposit systems to a broader range of packaging (OECD, 2016).

(b) Lack of integration with other streams and initiatives. Reverse vending machines mainly serve one purpose—container return. They could become multifunctional circular economy points, for example, also accepting household hazardous waste (batteries or lamps) (with appropriate separate compartments), or offering users the option to direct the returned deposit amount to support a local environmental NGO or a sharing initiative, turning container return from a purely economic transaction into an act of civic participation.

(c) Deposit amount and inflation. The deposit amount must be sufficiently meaningful to motivate returns. Over time, inflation can erode the real value of the deposit, reducing the incentive. A mechanism for periodic indexation of the deposit is needed.

Modernization recommendations:

Expansion of scope: Include glass bottles for wine and spirits, metal aerosol cans, possibly multi-layer packaging such as Tetra Pak (for which recycling technologies exist).

Integration with circular infrastructure: Transform reverse vending machines into multifunctional circular stations also accepting household hazardous waste (batteries, lamps) and offering users options for socially oriented use of deposit funds.

Support for reusable container systems: Part of revenues from unclaimed deposits should be directed to stimulating the development and spread of reusable container systems for beverages and food products (refillable bottles, reusable containers).

2.4. Legal formalization of food sharing and reduction of food waste

At the production and logistics level: improving harvesting practices, modernizing storage systems and cold chains, developing secondary markets for “imperfect” products.

At the retail level: revising cosmetic standards to allow the sale of “ugly” fruits and vegetables at a reduced price; introducing dynamic pricing for products approaching expiration; a legislative requirement for large chains to enter into partnerships with food banks for transferring unsold but edible products.

At the consumption level: large-scale educational campaigns explaining the difference between “use by” (safety) and “best before” (quality) dates; training in techniques for planning purchases, proper food storage, and creative use of leftovers.

Legal support for food sharing: adoption of a “Good Samaritan” protection law relieving food

donors from legal liability for good-faith donations; development of clear food safety guidelines for organizations engaged in food redistribution.

3. Key lessons for Program design
   Findings from the Israeli context. The Israeli experience demonstrates a classic case of a policy-implementation gap. Despite the presence of a generally adequate legislative base and recognition of the problem at the highest level, the system has proven unable to transform. Key causes of this failure include:
   Absence of a centralized empowered body with the authority and resources to coordinate and ensure the implementation of a national strategy.
   Weak economic signals: the landfill levy remains too low to create a real incentive for change.
   Critical shortage of physical infrastructure: without recycling plants, sorting centers, and composting facilities, no laws can be effectively implemented.
   Policy instability and short-term planning that deter private investors from long-term capital-intensive projects in the recycling sector.
   Insufficient attention to the upper tiers of the waste hierarchy (prevention, reuse), with a prevailing focus on recycling and landfilling.
   These lessons must be central to the design of the new Modernization Program.

4. List of sources used (based on the analytical part)

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