TECHNICAL ANNEX 1
KEY PERFORMANCE INDICATORS (KPI)
OF THE MUNICIPAL WASTE MANAGEMENT SYSTEM

This technical annex describes the system of key performance indicators (KPI) used to monitor the implementation of the National Strategy for the Transition to a Circular Municipal Waste Management System in Israel. For each indicator, the purpose of use, definition, calculation method, scope boundaries, baseline and target values, data sources, and institutional responsibility are provided.

All KPIs are calculated annually at the national level, with the possibility of disaggregation by regions and municipalities. Target values are set under two scenarios:
• baseline (realistic) scenario;
• enhanced (ambitious) scenario.

KPI 1. Municipal waste generation per capita
Purpose of use of the indicator.
Tracking the overall burden on the waste management system, the effectiveness of waste prevention policy, and the dynamics of waste volumes relative to the population size.
Definition and units of measurement.
Average annual volume of municipal solid waste (MSW) generation per resident, expressed in kg/person/year. Includes both mixed and separately collected MSW streams.
Calculation method (formula).
KPI1 = (Σ MSW_generated_per_year, t × 1,000) / Population_average_annual,
where Σ MSW_generated_per_year is the total mass of MSW generated within the country during the reporting year, based on data from municipalities and operators;
Population_average_annual is the average annual population according to CBS data.
Scope boundaries.
All municipal jurisdictions of Israel; includes waste falling under the definition of MSW (from households and equivalent sources: small businesses, institutions). Excludes construction waste, industrial and agricultural waste, wastewater sludge, and other specialized streams.
Baseline value (reference for 2025).
Reference: ≈ 680 kg/capita/year (based on assessments by MoEP, CBS, and international comparisons). The exact value is уточняется following harmonization of reporting and updating of waste composition/morphology (2026–2027).
Target values for 2030.
Baseline scenario: ≤ 620 kg/capita/year.
Enhanced scenario: ≤ 600 kg/capita/year.
Target values for 2035.
Baseline scenario: ≤ 520 kg/capita/year.
Enhanced scenario: ≤ 450 kg/capita/year (with a перспективой of ≈ 400 kg/capita/year by 2040).
Calculation frequency.
Annually, with the possibility of quarterly monitoring based on aggregated estimates.

Main data sources.
• Reporting by municipalities and regional corporations on MSW collection volumes (tonnes/year).
• Operators' data on collection/haulage, sorting, recycling, and landfilling.
• Central Bureau of Statistics (CBS) data on average annual population.
Responsible organizations.
• National Waste Management Authority (coordination, KPI calculation).
• Ministry of Environmental Protection (MoEP).
• Municipalities and regional corporations (provision of primary data).
Data quality and risks.
Risks: incomplete and non-comparable reporting among municipalities; double counting of certain streams; incomplete coverage of informal streams. Implementation of standardized reporting forms and reconciliation of data with waste composition/morphology studies is required.

KPI 2. Share of recycling, composting, and reuse in the total MSW stream
Purpose of use of the indicator.
Reflects the degree of transition from landfilling to waste management in a circular economy logic; used to assess the effectiveness of sorting and recycling infrastructure and reuse systems.
Definition and units of measurement.
Share of the total MSW stream (by mass) directed to material recycling, composting/anaerobic digestion, and preparation for reuse, expressed as a percentage of the total volume of MSW generated.
Calculation method (formula).
KPI2 = (MSW_to_recycling + MSW_to_compost/AD + MSW_to_reuse) / MSW_total × 100%,
where the numerator is the total mass of waste directed during the year to recycling, composting/AD, and preparation for reuse; the denominator is the total volume of MSW generated during the year.
Scope boundaries.
The same territorial boundaries as for KPI1. Includes all MSW streams for which there is documented proof of transfer to recycling/compost/AD/reuse (including activities of local hubs and reuse centers).
Baseline value (reference for 2025).
Reference: ≈ 20% of total MSW (based on MoEP data and recyclers' reports).
Target values for 2030.
Baseline scenario: ≥ 45%.
Enhanced scenario: ≥ 50%.
Target values for 2035.
Baseline scenario: ≥ 55%.
Enhanced scenario: ≥ 65% (with a перспективой of 70–75% by 2040).
Calculation frequency.
Annually.

Main data sources.
• Data from sorting facilities (MRF) and recyclers on accepted volumes of recyclables.
• Data from composting and anaerobic digestion operators on volumes of treated organics.
• Reporting by local reuse centers and circular hubs on volumes of items prepared for reuse.
• Reporting by municipalities and EPR operators.
Responsible organizations.
• National Waste Management Authority.
• MoEP.
• Sorting, recycling, and composting operators.
• EPR operators and local hubs (data provision).
Data quality and risks.
Risks: differences in accounting methods among operators; possible counting of waste that is in fact subsequently landfilled; incomplete coverage of informal reuse schemes. Unification of reporting and periodic audits of operators are required.

KPI 3. Share of waste directed to landfilling
Purpose of use of the indicator.
Characterizes the degree of system dependence on landfills and the speed of transition to more sustainable waste management methods.
Definition and units of measurement.
Share of the total MSW stream (by mass) annually disposed of in landfills and other final disposal facilities, as a percentage of total MSW generated.
Calculation method (formula).
KPI3 = MSW_to_landfilling / MSW_total × 100%,
where MSW_to_landfilling is the total mass of waste accepted by landfills and final disposal facilities during the year.
Scope boundaries.
Includes all licensed landfills and final disposal facilities in Israel, as well as (as data become available) streams exported outside the country, if any exist. MSW_total is calculated as in KPI1.
Baseline value (reference for 2025).
Reference: ≈ 80% of total MSW (based on current estimates).
Target values for 2030.
Baseline scenario: ≤ 55%.
Enhanced scenario: ≤ 45%.
Target values for 2035.
Baseline scenario: ≤ 25%.
Enhanced scenario: 15–18% (with a перспективой of ≤ 10% by 2040).
Calculation frequency.
Annually.
Main data sources.
• Official reporting by landfills and disposal facilities on accepted volumes (tonnes/year).
• MoEP data on licensed facilities.
• Reporting by municipalities and operators on allocation of MSW streams.

Responsible organizations.
• National Waste Management Authority.
• MoEP.
• Landfill operators (provision of primary data).
Data quality and risks.
Risks: underestimation of illegal dumping and unauthorized burning; incomplete reporting by certain landfills. Strengthened monitoring and enforcement against illegal dumping, as well as regular landfill inspections, are required.

KPI 4. Food loss and waste across the entire chain (food loss & waste)
Purpose of use of the indicator.
Reflects the effectiveness of measures to prevent food losses and waste and to redistribute food; linked to food security and climate targets.
Definition and units of measurement.
Total volume of food loss and waste across the entire chain (production, processing, retail, food service, households), expressed in million tonnes/year and as a percentage relative to the baseline level (taken as 100%).
Calculation method (formula).
KPI4_tonnes = Σ food_loss_and_waste_by_sector (million t/year).
KPI4_% = (KPI4_tonnes / KPI4_baseline) × 100%,
where KPI4_baseline is the volume of food loss and waste in the baseline year (2.6 million t/year).
Scope boundaries.
Includes food losses and waste at all stages of the supply chain within the country. Estimation methods may be based on sample studies, sector coefficients, and reporting by major actors (retail, HoReCa).
Baseline value (reference for 2025).
Reference: 2.6 million t/year (100%) based on national estimates (e.g., food waste reports).
Target values for 2030.
Baseline scenario: ≤ 1.8 million t/year (≈ –30% relative to baseline).
Enhanced scenario: ≤ 1.6 million t/year (≈ –35–40%).
Target values for 2035.
Baseline scenario: 1.4–1.6 million t/year (–40–45%).
Enhanced scenario: ≈ 1.3 million t/year (–50%).
Calculation frequency.
At least once every 3 years (if resources allow—annually based on aggregated estimates).
Main data sources.
• Specialized studies on food loss and waste (jointly with academic and sector partners).
• Data from large retail chains, HoReCa, producers, and processors.
• Household surveys and diary-based studies.
• International methodologies (FAO, UNEP, etc.).
Responsible organizations.
• MoEP.
• National Waste Management Authority.

• Relevant ministries (agriculture, health, social policy).
• Academic institutes and NGOs (conducting studies).
Data quality and risks.
Risks: high cost and methodological complexity of measurements; dependence on business willingness to share data. A mixed approach (surveys, sample measurements, model-based estimates) is recommended, and methodologies should be unified.

KPI 5. Safe collection and disposal of household hazardous waste (HHW)
Purpose of use of the indicator.
Assesses the effectiveness of the safe management system for household hazardous waste and reduces risks to health and the environment.
Definition and units of measurement.
Share of the estimated total volume of household hazardous waste generation (batteries, lamps, medicines, household chemicals, etc.) that enters specialized collection, transport, and disposal systems.
Calculation method (formula).
KPI5 = HHW_safely_collected / HHW_estimated_total_generation × 100%,
where HHW_safely_collected is the documented mass of household hazardous waste transferred to specialized systems; HHW_estimated_total_generation is an estimate of total HHW generation based on sales of relevant products and generation coefficients.
Scope boundaries.
Includes all household hazardous waste streams that enter official collection systems (fixed points, pharmacy programs, eco-mobiles, retail networks, EPR systems).
Baseline value (reference for 2025).
Reference: < 15% (based on expert assessments and partial operator data).
Target values for 2030.
Baseline scenario: ≥ 50%.
Enhanced scenario: ≥ 60%.
Target values for 2035.
Baseline scenario: ≥ 70%.
Enhanced scenario: 80–85% (with a перспективой of ≥ 90% by 2040).
Calculation frequency.
Annually (as the reporting system develops—quarterly tracking of specific streams may be possible).
Main data sources.
• Operators' reporting on HHW collection (batteries, lamps, medicines, etc.).
• Sales of relevant products (data from producers, importers, retail).
• Estimated HHW generation coefficients.
• EPR systems data.
Responsible organizations.
• MoEP.
• National Waste Management Authority.
• HHW operators and EPR systems.
• Municipalities (organization of collection points).

Data quality and risks.
Risks: uncertainty in estimating total HHW generation; incomplete operator reporting; possible leakage of part of the streams into illegal schemes. It is important to periodically update generation coefficients and conduct sample studies.

KPI 6. Population coverage with access to circular hubs and sharing services
Purpose of use of the indicator.
Characterizes accessibility of infrastructure for reuse, repair, exchange of goods, and food sharing for the population.
Definition and units of measurement.
Share of households residing within walking distance or short transport accessibility to at least one functioning circular service (reuse center, library of things, repair café, regular swaps, food sharing spaces).
Calculation method (formula).
KPI6 = Households_with_access / Households_total × 100%,
where Households_with_access is the number of households residing within a defined radius (e.g., 15–20 minutes on foot/by public transport) of at least one circular hub or service.
Scope boundaries.
Includes all registered circular hubs and services included in the national registry.
Accessibility is assessed based on geospatial (GIS) analysis and settlement data.
Baseline value (reference for 2025).
Reference: < 5% of households with access (isolated hubs and local initiatives).
Target values for 2030.
Baseline scenario: ≥ 30% of households with access.
Enhanced scenario: ≥ 40%.
Target values for 2035.
Baseline scenario: ≥ 50%.
Enhanced scenario: ≥ 70%.
Calculation frequency.
At least once every 2–3 years (upon updating the hub registry and settlement data).
Main data sources.
• National registry of circular hubs and services.
• Population and household data (CBS).
• Geospatial data (GIS).
Responsible organizations.
• National Waste Management Authority.
• MoEP.
• Municipalities and NGOs (hub registration and information provision).
Data quality and risks.
Risks: incomplete registration of initiatives, especially small and volunteer-based; difficulties in defining “actual” access (barriers by time, cost, social reasons). Regular updates of the registry and the use of surveys to verify accessibility are required.

KPI 7. Greenhouse gas emissions of the waste sector

Purpose of use of the indicator.
Assesses the contribution of the waste sector to national greenhouse gas emissions and the effectiveness of measures to reduce them.
Definition and units of measurement.
Total greenhouse gas emissions (in CO_2-equivalent) attributable to the MSW sector (methane from landfills, emissions from waste incineration, transport, and treatment), as well as their share in total national emissions.
Calculation method (formula).
KPI7_absolute = Σ waste_sector_emissions (million t CO_2-eq./year).
KPI7_share = KPI7_absolute / Total_national_emissions × 100%.
Calculations are carried out using IPCC methodologies based on data on waste volumes, composition, treatment technology, and methane capture.
Scope boundaries.
Includes:
• methane emissions from landfills (taking into account capture systems and actual monitoring);
• emissions from waste incineration facilities (WtE);
• emissions from transport and treatment of MSW;
• where data are available—avoided emissions due to recycling and reuse (in a separate indicator).
Baseline value (reference for 2025).
Reference: ≈ X million t CO_2-eq./year (about 8% of total national emissions). The exact value is уточняется within national climate reporting.
Target values for 2030.
Baseline scenario: reduction of at least 30% relative to the 2025 level.
Enhanced scenario: reduction of at least 40% relative to the 2025 level.
Target values for 2035.
Baseline scenario: reduction of at least 50% relative to the 2025 level.
Enhanced scenario: reduction of at least 70% relative to the 2025 level.
Calculation frequency.
At least once every 3 years (aligned with national climate reporting cycles).
Main data sources.
• National climate inventories (MoEP, relevant climate units).
• Landfill data on disposed volumes and methane capture systems.
• WtE data (if facilities exist).
• Estimates of emissions from transport and treatment (based on operator data and models).
Responsible organizations.
• MoEP (climate unit).
• National Waste Management Authority.
• Landfill and WtE operators.
• Academic partners (methodological support and independent verification).
Data quality and risks.
Risks: complexity of accounting for all emissions components; dependence on accuracy of models and operator data; possible changes in international methodologies (IPCC).

Transparency of calculations and periodic independent verification are required.

KPI 8. Household participation in separate waste collection
Purpose of use of the indicator.
Assesses the level of public engagement in separate collection and serves as an indicator of the success of educational and infrastructure measures.
Definition and units of measurement.
Share of households that on a regular basis sort waste into at least two to three fractions (based on surveys and/or actual data from PAYT and RFID systems).
Calculation method (formula).
KPI8 = Households_regularly_sorting / Households_total × 100%,
where Households_regularly_sorting is the share of households that report regular separate collection in surveys and/or are identified by PAYT/RFID data as consistently using containers for recyclables/organics.
Scope boundaries.
Includes households across the country; disaggregation by municipality types and social groups is possible. The criterion of "regularity" must be clearly defined in the methodology (e.g., sorting at least X times per month).
Baseline value (reference for 2025).
Reference: ≈ 40% of households (based on survey estimates and partial municipal data).
Target values for 2030.
Baseline scenario: ≥ 60%.
Enhanced scenario: ≥ 70%.
Target values for 2035.
Baseline scenario: ≥ 80%.
Enhanced scenario: ≥ 85%.
Calculation frequency.
At least once every 2 years (representative surveys); where technically feasible—annually based on administrative data.
Main data sources.
• Representative household surveys (national and municipal).
• PAYT and RFID system data, where implemented.
• Municipal estimates based on volumes of separately collected fractions.
Responsible organizations.
• National Waste Management Authority.
• MoEP.
• Municipalities.
• Statistical services and research centers (survey administration).
Data quality and risks.
Risks: discrepancies between declared and actual behavior (social desirability bias); limited coverage of PAYT/RFID systems. It is recommended to combine surveys with objective data (fraction volumes, routes, RFID).

KPI 9. Number of functioning local circular hubs

Purpose of use of the indicator.
Shows the scale and institutionalization of circular economy infrastructure at the local level.
Definition and units of measurement.
Number of active local circular hubs (reuse centers, libraries of things, repair cafés, swap spaces, food sharing sites, etc.) registered in the National Registry and meeting the criteria of functioning.
Calculation method (formula).
KPI9 = Number_of_hubs_in_registry_with_status_“functioning”.
Minimum functioning criterion, for example: at least 6 months of operation per year and at least 100 unique users per year.
Scope boundaries.
Includes all hubs officially entered in the National Registry and having passed annual status verification (self-report + sample verification).
Baseline value (reference for 2025).
Reference: < 10 hubs (fragmented initiatives without a unified registration system).
Target values for 2030.
Baseline scenario: ≥ 100 hubs.
Enhanced scenario: ≥ 120–150 hubs.
Target values for 2035.
Baseline scenario: ≥ 150 hubs.
Enhanced scenario: ≥ 200–300 hubs.
Calculation frequency.
Annually (updating the registry and hub status).
Main data sources.
• National registry of circular hubs.
• Reporting by municipalities and NGOs on hubs.
• Data from projects supported by the Circular Fund and other programs.
Responsible organizations.
• National Waste Management Authority.
• MoEP.
• Municipalities and NGOs (hub operators).
Data quality and risks.
Risks: undercounting of informal initiatives; possible inflation of reported figures. It is important to combine self-reporting with sample checks and a public hub map.

KPI 10. Financial sustainability of the waste management system
Purpose of use of the indicator.
Assesses the degree of self-financing of the waste management system through revenues from secondary materials, energy, EPR contributions, deposit systems, and tariffs (PAYT, etc.).
Definition and units of measurement.
Share of total operating expenditures of the MSW management system (national and regional levels) covered by revenues from sales of recyclables, energy (biogas, WtE), EPR contributions, deposit systems, PAYT payments, and other related fees.

Calculation method (formula).
KPI10 = Revenues_from_recyclables_energy_and_fees / System_operating_expenditures × 100%,
where revenues include all inflows directly related to operation of the MSW management system, and operating expenditures include costs for collection, transport, sorting, recycling, organics treatment, landfilling, and management.
Scope boundaries.
Includes national and regional expenditures and revenues related to MSW management. Capital investments may be accounted for separately, depending on the selected methodology.
Baseline value (reference for 2025).
Reference: low share of self-financing (a significant part of expenditures is covered from general budgets; the exact assessment is уточняется within the preparation of the National Financial Balance of the system).
Target values for 2030.
Baseline scenario: ≥ 45% of operating expenditures covered by system revenues.
Enhanced scenario: ≥ 50%.
Target values for 2035.
Baseline scenario: ≥ 60%.
Enhanced scenario: 70–80%.
Calculation frequency.
Annually (after closing the financial year).
Main data sources.
• Financial reporting of the National Waste Management Authority.
• Reporting by municipalities and regional corporations on MSW-related revenues and expenditures.
• Data from recycling, WtE, composting operators, and EPR systems.
• Budget reports (landfill levy, etc.).
Responsible organizations.
• National Waste Management Authority (aggregation and calculation).
• MoEP and Ministry of Finance (financial sustainability policy).
• Municipalities and regional corporations.
• Operators and EPR systems.
Data quality and risks.
Risks: differences in accounting practices among entities; incomplete transparency of revenues and expenditures; complexity of separate accounting by streams. Development of a unified financial accounting methodology for the waste sector and increased transparency are required.