

## ISRAEL - NATIONAL REPORT CSD-18

### WASTE MANAGEMENT

#### **Introduction**

Integrated waste management is an important component of Israel's environmental policy. To address the challenges of both solid and hazardous waste, the Ministry of Environmental Protection has formulated policies founded on reduction at source, reuse and recycling, with disposal as the last priority.

#### **Prevention and minimization and environmentally sound management of hazardous wastes**

Appropriate safety and control procedures for handling and treating hazardous substances and their wastes from "cradle to grave" are integral elements in Israel's environmental management program. By means of the Hazardous Substances Law, Israel has instituted administrative and legislative measures to control hazardous substances at every stage of production, storage, transfer, maintenance, use, and disposal. The Hazardous Substances Law obligates any person dealing with a hazardous substance to apply for a Hazardous Materials Permit. The applicant must provide details on the types and quantities of hazardous materials handled and the types and quantities of hazardous waste produced.

#### **Policy measures for the prevention and minimization of hazardous wastes**

Israel's policy on hazardous waste is based on minimization, reuse, recycling, neutralization and safe disposal of hazardous wastes, according to the following priorities:

- **Recovery** of the hazardous waste through recycling or reuse.
- **Reuse** of the waste as an energy source through incineration in a facility which recovers the energy.
- **Disposal** of hazardous waste, including landfilling, above-ground collection and incineration without energy recovery.

Pollution reduction action plans, which include requirements for best available techniques, have been instituted in the Ramat Hovav industrial zone and in Haifa Bay,

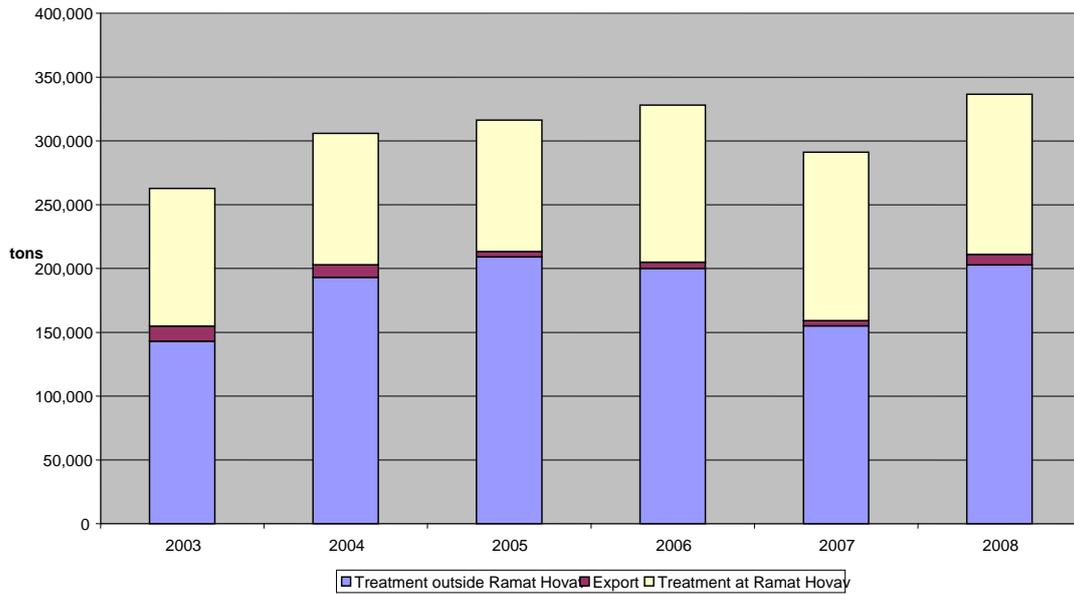
Israel's two hotspots of pollution. The Ramat Hovav area in the south of the country includes 17 industrial plants, most of which produce large quantities of wastewater, with a composition and concentration of hazardous substances that are especially difficult to treat. Since the mid-1990s, measures have been taken to upgrade the storage, treatment, disposal and incineration of the hazardous wastes emanating from these industrial plants. Plants are required to stop the discharge of wastewater to the central treatment system and to establish and operate individual sewage treatment systems and evaporation ponds at the plant level in accordance with stringent standards.

In 2008, most of Israel's treated hazardous waste (68%) was disposed, only 2.4% was exported for treatment and the rest was recovered. Although disposal is still the most prevalent treatment method, the trend is beginning to change in accordance with the Ministry of Environmental Protection's policy.

The total quantity of hazardous waste which was treated in Israel in 2008 was 336,458 tons, with the following distribution:

- Hazardous waste which reached the hazardous waste treatment plant in Ramat Hovav (125,400 tons);
- Hazardous waste which reached other destinations for disposal, treatment, recycling and reuse (with prior approval) (202,894 tons);
- Hazardous waste which was exported abroad for treatment/recycling (8,164 tons).

### Hazardous Waste Quantities in Israel



### Transfer of environmentally sound technologies and know-how on clean technologies and low-waste production

The Ministry of Environmental Protection and other organizations promote the assimilation of knowledge and know-how on clean technologies by:

- Exposing Israel's industry to new technologies via conferences on selected issues.
- Financially supporting cross-cutting projects which aim to reduce hazardous waste by a number of factories or an industrial sector.
- Organizing international environmental technology conferences and exhibitions that showcase Israel's innovative clean technologies and low-waste production, including CleanTech - the International Summit and Exhibition for Renewable Energy and Water Technologies, Recycling and Environmental Quality, Infrastructure and Green Building (<http://www.mashovgroup.net/cleanTechEnglish/tabid/99/Default.aspx>) and WATEC Israel, the International Conference and International Water Technologies & Environmental Control Exhibition (<http://watec-israel.com/index.php>)
- Israel's Cleaner Production Center, established by the Ministry of Environmental Protection and the Manufacturers Association of Israel in 2001, provides information on clean production, including manuals for different

industrial sectors, case studies and environmental standards. Within the framework of the Center, the Ministry of Environmental Protection has published a call for proposals for assistance to industrial plants in reviewing the feasibility of pollutant reduction at source and more efficient use of resources. Consultation will relate, *inter alia*, to reducing the quantity and/or toxicity of hazardous wastes.

**Initiatives to treat, recycle, reuse and dispose of wastes at the source of generation and regulatory mechanisms (Polluter-pays principle)**

Israel is intensifying its efforts to increase recycling and recovery of hazardous waste, through, *inter alia*, proposed hazardous waste treatment and disposal regulations that will prioritize reduction at source and recycling. The goal is to have Israeli industries shift from end-of-pipe solutions to treatment at source solutions which include minimization of hazardous waste through reduced use of certain hazardous substances, introduction of clean production technologies and reuse and recycling of hazardous waste.

New regulations on hazardous waste treatment and disposal are currently being drafted under the Hazardous Substances Law. The regulations will introduce three principal changes to the field of hazardous waste:

- A change in the method of defining hazardous waste which will be according to the relevant EU Directives, with the necessary adjustments to Israel's particular conditions and needs.
- Prioritization of hazardous waste management methods, in line with EU policy. Accordingly, Israel's environmental policy will place first priority on reducing the quantity or toxicity of hazardous waste at source; second priority will be given to recycling or reuse of the waste; third priority will be given to using the waste for energy production; disposal of the waste will be the lowest priority. In order to implement these priorities, once the regulations have entered into force, entities using hazardous substances will be required to prepare a hazardous waste treatment plan, requiring approval by the Ministry of Environmental Protection, as a prerequisite for receiving a Hazardous Materials Permit.

- The regulations will specifically relate to producer responsibility and will include a mechanism for enforcement and inspection of hazardous waste from cradle to grave as well as requirements and guidelines on hazardous waste treatment which are targeted at producers of hazardous waste, transporters, transfer stations and treatment, recycling and disposal facilities

To encourage the reduction of hazardous waste quantities, the Ministry of Environmental Protection grants financial aid to industries for the reduction of hazardous waste volume which would otherwise be sent to the national site for the treatment of hazardous waste at Ramat Hovav. The ministry finances up to 40% of the investment value, with priority to plants in which waste or waste toxicity is reduced at source. The ongoing project has led to a significant decrease in hazardous waste generation in Israel and has convinced industry that economic savings can go hand in hand with environmental improvement.

Furthermore, with the introduction of the Environmental Protection Law (Polluter Pays), 2008, potential polluters are increasingly deterred from mishandling waste. This law links the benefit derived or the profits reaped from committing an environmental offense to the penalties imposed.

### **Procedures for environmental impact assessment, taking into account the cradle-to-grave approach**

Cradle-to-grave management of hazardous substances is incorporated in the provisions of the Hazardous Substances Law. By means of this law, Israel has instituted administrative and legislative measures to control hazardous substances at every stage of production, transfer, maintenance, use and disposal.

Israel's Environmental Impact Assessment (EIA) Regulations of 2003 require EIAs for plans, which in the opinion of the planning authority, may have significant environmental impact, including wastewater treatment plants and waste disposal sites. In addition, requirements for EIA are incorporated into the regulations of national master plans on waste disposal. The regulations specifically stipulate that sustainable development principles must be incorporated in EIAs.

## **Recovery, reuse and recycling of hazardous wastes and their transformation into useful material**

Hazardous waste is treated, recycled or used as a source of energy both in the national treatment site for hazardous waste at Ramat Hovav and at other authorized sites. All operations are subject to the supervision and approval of the Ministry of Environmental Protection, under the Licensing of Businesses Regulations (Disposal of Hazardous Substances Waste), 1990.

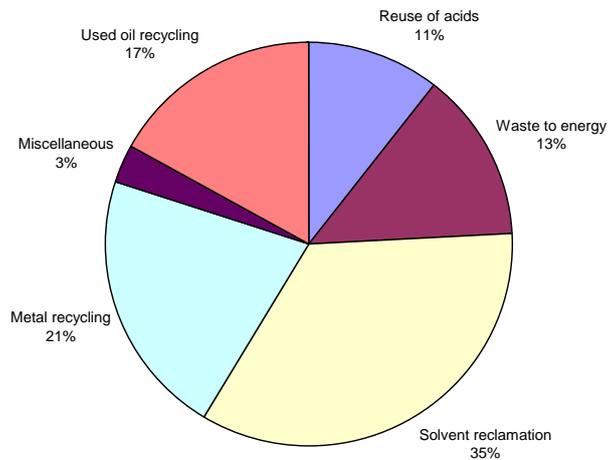
Recycling in Israel centers on the reclamation, regeneration or recycling of the following hazardous wastes: solvents, organic substances which are not used as solvents, metals and metal compounds, acids or bases, and used oil re-refining. Industries have succeeded in safely recycling metal wastes including copper, lead, manganese, tungsten, zinc, gold and other precious metals.

To assure environmentally sound management of hazardous waste facilities, special conditions have been formulated within the framework of business licensing regulations for recycling facilities, waste treatment facilities and transfer stations.

Nearly 99,000 tons of hazardous waste were recovered in 2008, with the following distribution:

- Reuse of acids – 10,556 tons
- Waste to energy – 13,333 tons
- Solvent reclamation – 34,108 tons
- Metal recycling – 21,264 tons
- Miscellaneous (include clinker additive) – 3,004 tons
- Recycling of used oil – 16,692 tons

**Hazardous Waste Recovery (2008)**



### **Phase-out of toxic, persistent and bio-accumulative waste**

The Ministry of Environmental Protection regularly reviews information about toxic waste that may pose unreasonable health and environmental hazards. In accordance with this information, decisions to phase out the use of chemicals resulting in persistent and bio-accumulative waste are prioritized. For example, permits for PCBs are not granted; the use of alkyl-mercury compounds in agriculture and mercury compounds in the pulp and paper industry has been eliminated; and the use of leaded gasoline is prohibited.

### **Environmentally sound waste disposal and treatment**

Israel's regulations on hazardous waste relate to the disposal, treatment, import and export of hazardous waste. Licensing of Businesses Regulations (Disposal of Hazardous Waste), 1990, require owners of industrial plants to dispose of hazardous wastes originating in the plant, as soon as possible after production and no longer than six months after production, to the national site for the disposal and treatment of hazardous waste in Ramat Hovav, or to transfer it for recycling, reuse or treatment elsewhere, following written approval from the Ministry of Environmental Protection. Some of the waste generated by industrial plants in Israel is treated, recycled or reused in-house.

The hazardous waste treatment plant at Ramat Hovav is operated by the Environmental Services Company Ltd., a government-owned company under the responsibility of the Ministry of Environmental Protection. It handles inorganic, organic, liquid and solid hazardous waste using different treatment processes and technologies: neutralization, detoxification, recycling, on-site incineration, secured landfilling and solidification/stabilization of inorganic waste and solid waste before landfilling .

A comprehensive remediation program for the hazardous waste treatment site at Ramat Hovav was initiated in 2006. At its completion, the site will be transformed into a state-of-the-art plant for the treatment of hazardous waste, complying with the most stringent safety and environmental standards.

In 2008, disposal of hazardous waste in Israel totaled 231,779 tons, which largely consisted of physico-chemical treatments (neutralization/sedimentation/volume reduction with landfilling of the products) (56%) and landfilling (24%) Other disposal methods included incineration without energy recovery (13%) and biological treatment (7%)

### **Inventories of hazardous waste production, their treatment/disposal, and contaminated sites**

- **Pollutant Release and Transfer Register:** The Ministry of Environmental Protection is in the process of building a Pollutant Release and Transfer Register (PRTR). Screening of existing PRTR systems has been completed and the definition of the scope for Israel (including sectors, pollutants, threshold levels, legislative and administrative preparations) is in process. A pilot study on the selection of an appropriate PRTR for Israel, in which about ten plants representing different industrial sectors, including the chemical sector, will participate, is scheduled for 2010. The system is expected to begin gradual operation in 2012.
- **Hazardous Materials Permit:** The Ministry of Environmental Protection utilizes the Hazardous Materials Permit as an important tool in the control and management of hazardous waste. The following information must be included

- **Information and Response Center for Hazardous Substances:** The Ministry of Environmental Protection's Information and Response Center compiles data on hazardous materials which are used, produced, imported, exported, transported, recovered and disposed of in Israel.

#### **Establishment of combined treatment/disposal facilities for hazardous wastes in small- and medium-sized industries**

Small and medium-sized industries comply with the same regulations as large industries. However, small and medium-sized industries may ship their chemical waste to transfer stations, in which the waste is collected for transport together with other companies' waste to Ramat Hovav. This helps cut the costs of shipping and handling.

#### **Dissemination of scientific and technical information dealing with various health and environmental aspects of hazardous wastes**

A National Center for Hazardous Substances and Environmental Studies, established by the Ministry of Environmental Protection, instructs and trains all emergency services, including police, fire fighting services, army units and medical services that deal with incidents involving hazardous substances. Subjects include integrated response procedures, risk assessment and hazardous substances legislation.

Safety at Work Regulations on Material Safety Data Sheets, promulgated in 1998, require producers, importers, distributors or sellers of a hazardous substance to supply recipients with Material Safety Data Sheets (MSDS). The regulations call for the maintenance of an MSDS in the factory or business in order to inform users about hazardous substances in their workplace.

Emergency procedures in plants in which hazardous materials are used and hazardous waste is generated include requirements for identification and assessment of safety, health and environmental hazards.

### **Notification systems and registries of exposed populations**

The Ministry of Environmental Protection established an Information and Response Center for Hazardous Substances in 1993. The Center provides data and support on a 24-hour-a-day basis, including data on hazardous materials which are used, produced, imported, exported, transported, recovered and disposed of in Israel, and serves as a focal point of response and risk assessment during hazardous substances spills and accidents

Clear notification systems exist for emergencies involving hazardous waste.

### **Preventing illegal international traffic in hazardous wastes**

Israel fully complies with the provisions of the Basel Convention on the Transboundary Movement of Hazardous Wastes and their Disposal.

## **Environmentally sound management of solid (non-hazardous) wastes and sewage, in the context of integrated planning and management of land resources**

### **Wastewater Management in Israel: An Overview**

The combination of severe water shortage, contamination of water resources, densely populated urban areas and highly intensive irrigated agriculture, makes it essential for Israel to put wastewater treatment and reuse high on its list of national priorities. Out of a total of 500 million cubic meters of sewage produced in Israel in 2008, about 70% of the effluents were reclaimed. In recent years new or upgraded intensive treatment plants were set up in municipalities throughout the country. The ultimate objective is to treat 100% of Israel's wastewater to a level enabling unrestricted irrigation in accordance with soil sensitivity and without risk to soil and water sources.

Israel's intensive wastewater treatment plants, which use the activated sludge method, generate large quantities of sludge. The Ministry of Environmental Protection regards sludge as a valuable resource for fertilization and soil improvement, but only following appropriate treatment. In 2004, regulations on the use of sludge were promulgated which require wastewater treatment plants to stabilize and treat the sludge they generate as a condition for agricultural use or soil improvement.

In 2010, Israel's Knesset (parliament) approved Public Health Regulations (Effluent Quality Standards), 2010 which further Israel's treatment of wastewater. They include maximum levels for dissolved and suspended elements and compounds and for 37 different parameters in effluents for unrestricted irrigation and discharge to rivers

### **Introduction – Solid Waste**

The problems associated with waste disposal and treatment in Israel are compounded by the country's unique conditions: a high rate of population growth – higher than other developed countries, rising standards of living and consumption patterns, accelerated building and industrial activity and one of the highest population densities in the developed world .

Due to land scarcity in Israel, the capacity of today's landfills will soon be exhausted. Moreover, landfills "consume" valuable land and are associated with both direct and indirect environmental and economic costs.

Local authorities in Israel are responsible for storage, collection and disposal of municipal solid waste, and municipal bylaws determine the legal and administrative arrangements for collection and disposal. Municipalities are authorized to establish sites for landfills and to determine other waste disposal and treatment locations in accordance with the Planning and Building Law and its regulations and the National Master Plan for Solid Waste Disposal. Disposal and treatment of solid waste require a business license and are subject to special conditions within the framework of the Licensing of Businesses Law.

The statutory tool for allocating sites for waste disposal and treatment, under the Planning and Building Law, 1965, is the National Outline Plan for Solid Waste. Siting

of landfills is based on environmental criteria (such as geohydrological conditions) and on planning criteria (such as distance from population centers and land use). Each proposed site is subject to environmental impact assessment.

### **Policies aimed at waste prevention and minimization, reuse and recycling**

Several laws and regulations have been enacted in Israel in the field of recycling, including:

- **Collection and Disposal of Waste for Recycling Law, 1993**, which authorizes local authorities, and obliges them when required by the Ministry of Environmental Protection, to allocate sites for recycling centers and to install recycling facilities and containers.
- **Collection and Disposal of Waste for Recycling Regulations (Obligation of Waste Disposal for Recycling), 1998**, which requires local authorities to reduce their waste for disposal by means of recycling in accordance with graduated recycling targets.
- **Deposit Law on Beverage Containers, 1999**, which came into force in 2001 and requires manufacturers, importers and retailers to collect a deposit on beverage containers larger than 0.1 liters and smaller than 1.5 liters. A February 2010 amendment to the law imposes direct responsibility for collection on producers and importers, including the collection of larger beverage containers.
- **Landfill Levy Amendment to the Maintenance of Cleanliness Law, 2007**, which requires landfill operators to pay a levy for every ton of waste landfilled. The levy aims to internalize the full and real costs of waste treatment and disposal.
- **Tire Disposal and Recycling Law, 2007**, which aims to reduce environmental hazards caused by improper tire disposal while promoting waste recycling. The law sets graduated targets for the disposal and recycling of used tires, and is based on the principle of "extended producer responsibility."
- **Packaging Bill**, distributed for comment to government ministries in February 2010, which aims to minimize the environmental impact of packaging waste, while transforming the waste into a resource and preventing the waste and

pollution of land resources. The proposed law aims to regulate the treatment of packaging in Israel and is based on the principle of manufacturer responsibility.

In 2006, the main elements of the Environment Protection Ministry's integrated waste management policy were approved by the National Planning and Building Board, in the form of a Sustainable Solid Waste Management Master Plan until the year 2020. The plan presents a comprehensive framework for environmentally sound management of solid waste, including rules, criteria, approaches and long-term goals for achieving integrated solid waste management. It relates to all stages of solid waste management, to all generators of waste and to a wide range of treatment methods.

The master plan outlines the steps necessary to achieve the goals of solid waste management in Israel. Each step is made up of two components: actions that will serve as “agents of change” to achieve the long-term goals of the master plan, and regulative, economic and informational tools to facilitate the process.

In accordance with the recommendations of the master plan, Israel's statutory master plan for solid waste management is currently being amended. The goal is to facilitate and simplify planning for recycling and recovery facilities, offering different treatment options and based on environmental criteria.

**Additional measures for minimization of disposal and increase in recycling include:**

- Several private companies collect electronic waste for recycling.
- Neighborhood drop off centers have been established in many local authorities.
- The website of the Cleaner Production Center includes a waste material exchange bulletin board with two listings: supply and demand. Advertising on the exchange is free of charge.
- A green procurement initiative by government is helping to promote the use of recycled materials in all ministries and affiliated bodies. Environmental criteria are incorporated into the public procurement of several products and

- A government decision taken in December 2009, entitled "*Green Government – Operational Efficiency of Government Ministries*" aims at setting the Israeli government and its agencies as an example of sound environmental management, based on sustainable development principles. Government offices are expected to reduce resource consumption, reduce waste and increase the use of recycled materials
- Israel's only cement plant uses refuse derived fuel (RDF) as well as hazardous waste as a source of energy.
- Top priority is given to the collection, recycling and reuse of construction and demolition (C&D) waste: voluntary agreements with the Manufacturers Association and with the Contractors and Builders Association to promote recycling of C&D waste are in effect; active quarries are required to recycle C&D waste at a certain rate of the quantity of material extracted at the quarry; government bodies are required to include 20% use of recycled fill material in infrastructure projects; and at least 20% recycled C&D waste materials are to be used for large infrastructure projects and recycling on site

The website of the Ministry of Environmental Protection includes comprehensive information on solid waste disposal, treatment and recycling which is targeted at both professionals and the general public. The information includes: listings of companies and plants which collect and recycle waste, professional guidelines on waste treatment and on the establishment, operation and closure of landfills, and listings of authorized landfills and transfer stations for the disposal and treatment (including recycling) of solid waste, hazardous waste and C&D waste.

**Development of environmentally sound disposal facilities, including technology to convert waste into energy, such as, for example, through utilization of landfill methane**

Solid waste management has undergone major improvements since the early 1990s when 96% of Israel's municipal solid waste made its way to hundreds of illegal and

polluting disposal sites and transfer stations throughout the country. A 1993 government decision mandated the closure of the country's unregulated dumps and their replacement by state-of-the art regional and central landfills, with implementation completed in 2003. Today, most of the country's waste (nearly 80%) is disposed to 14 state-of-the art landfills, located in different regions of the country. All of the country's regulated landfills have installed systems for leachate collection and treatment and prevention of leachate leakage and most have installed, or will soon install, systems for the collection and treatment of gas emissions. Several landfills have begun to operate facilities for landfill gas extraction and energy recovery.

Within the framework of the Clean Development Mechanism, Israel's major landfills have applied to the National Designated Authority for approval of projects dealing with landfill gas treatment recovery, electricity production and methane reduction ([http://www.sviva.gov.il/Environment/bin/en.jsp?enPage=e\\_BlankPage&enDisplay=view&enDispWhat=Zone&enDispWho=Waste Projects\\_cdm&enZone=Waste Projects\\_cdm](http://www.sviva.gov.il/Environment/bin/en.jsp?enPage=e_BlankPage&enDisplay=view&enDispWhat=Zone&enDispWho=Waste Projects_cdm&enZone=Waste Projects_cdm)). For example, the Hiriya landfill project was the first in Israel to be registered by the Executive Board of the CDM (2006). A methane gas collection system was set up at the landfill and the gas collected is concentrated in a central transport pipeline and transferred to a flare for treatment. The biogas is being used as an energy source for a nearby industrial plant.

### **Financial mechanisms for waste management service development in deprived areas**

Between 1994 and 2003, financial support was provided to local authorities in Israel for transporting their waste to regulated landfills following the closure of illegal dumps. In more recent years, financial support was given for recycling programs, including material recovery facilities, recycling centers, recycling infrastructure for C&D waste and educational programs on recycling

A 2007 amendment of the Maintenance of Cleanliness Law, 1984, introduced a landfill levy. The revenues from this levy, as well as from fines, are allocated entirely for recycling and recovery schemes by local authorities and entrepreneurs. In 2008 and 2009, the directorate of the Maintenance of Cleanliness fund published criteria for

financial assistance from landfill levy funds for separation at source, recycling and education and information projects.

Based on these criteria, recycling projects were approved for dozens of local authorities. Funds collected in 2007-2008 totaled about \$28 million, of which some \$10 million have already been returned to local authorities to help reduce recovery costs and promote recycling, composting, waste to energy and sustainable materials management. A multi-million dollar budget has been allocated by the Ministry of Environmental Protection for the promotion of technologies for waste management.

### **Radioactive wastes and their environmentally sound management (safe storage, transportation and disposal of radioactive waste)**

The Hazardous Substances Regulations (Disposal of Radioactive Waste), 2002, set prohibitions, obligations and limitations on the disposal of different types of radioactive wastes – solid, liquid, sealed and unsealed. Radioactive waste must be disposed either to the national repository for radioactive waste or to municipal waste sites following specific steps to bring the wastes to a level that is permitted for safe disposal. Additional prohibitions or limitations are set on burning radioactive waste, disposing of animal carcasses containing radioactive waste, and disposing of liquid radioactive waste to the sewage system. Holders of radioactive waste are required to keep careful records on radioactive wastes and their manner of disposal.

The national radioactive waste disposal site handles all radioactive waste produced in Israel. The site is ISO 14001 certified and was planned according to international safety and operations principles. In recent years, as part of an overall policy to reduce the transportation of short life span radioactive waste, institutions such as hospitals and research facilities maintain safe rooms for the waste. The radioactive waste is safely stored and monitored up to the point that the waste is no longer active and can be disposed of using conventional methods.