

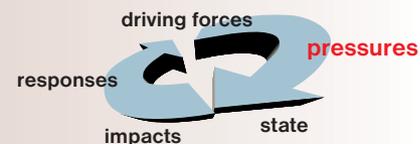
Waste and material flow



Economic development requires natural resources – i.e. materials that we use in the production of paper, steel, plastic, cement and fodder and which we integrate in our life in the form of roads, packaging, food and other. Since the majority of natural resources are not unlimited and renewable, we can ensure equal opportunities to future generations only provided that we employ responsibility in the field of resources management. In its Sustainable Development Strategy, the EU has set as one of its primary goals the severing of links between economic growth, use of natural resources and production of waste.

On a daily basis, human activities generate huge quantities of waste which needs to be collected and, if possible, reused with a view to reducing the burden on the environment, since otherwise it has to be stored and disposed, respectively, in an appropriate location. When disposing waste, leachate is generated which may contain hazardous substances and for this reason landfills have to be suitably arranged. According to estimates, there exist from 50 000 to 60 000 illegal waste dumps in Slovenia which do not meet this condition. According to Eurostat assessments, the average quantity of municipal waste collected in the EU-15 amounted to 559 kg per capita in 2002. In Slovenia, 411 kg of household waste per capita was deposited in 2002.

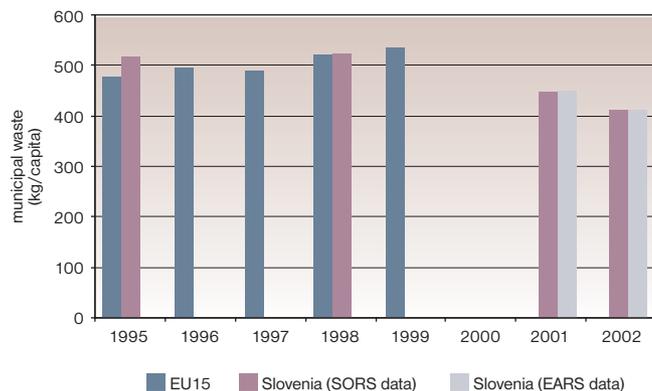
In addition to household waste, there is waste from the industry sector which also generates hazardous wastes which need to be destroyed. If the destruction of waste is not possible in one country, it has to be exported for destruction abroad, i.e. to a country with appropriate technology. The data of both the Environmental Agency of the Republic of Slovenia (EARS) and the Statistical Office of the Republic of Slovenia (SORS), attest to the increased quantity of annual waste generated in Slovenia. However, the numbers are higher, in part, also as a result of better recording by waste producers.



33. GENERATION OF MUNICIPAL WASTE

Municipal waste is waste from households and other waste which by its nature and composition is similar to household waste. The Environment Protection Act (OJ RS No 41/04) defines municipal waste management (collection and transport) as an obligatory local public service of environmental protection. Handling of separate fractions of municipal waste is governed by the Order on the Management of Separately Collected Fractions in the Public Service of Urban Waste Management (OJ RS No 21/01). Separately collected fractions are that part of municipal waste which is generated within the boundaries of the local community as waste in households and is similar in its nature and composition to waste in industry, crafts and services.

Figure 33-1: Generation of municipal waste per capita in Slovenia and the EU-15



GOAL

The National Environmental Action Programme envisages a reduction in the quantity of municipal waste generated, an increase in the material and energy recovery of waste, a reduction of greenhouse gas emissions and establishment of an efficient waste management system. The Order on the Management of Separately Collected Fractions in the Public Service of Urban Waste Management (OJ RS No 21/01) represents a legal basis for the achievement of the objectives.

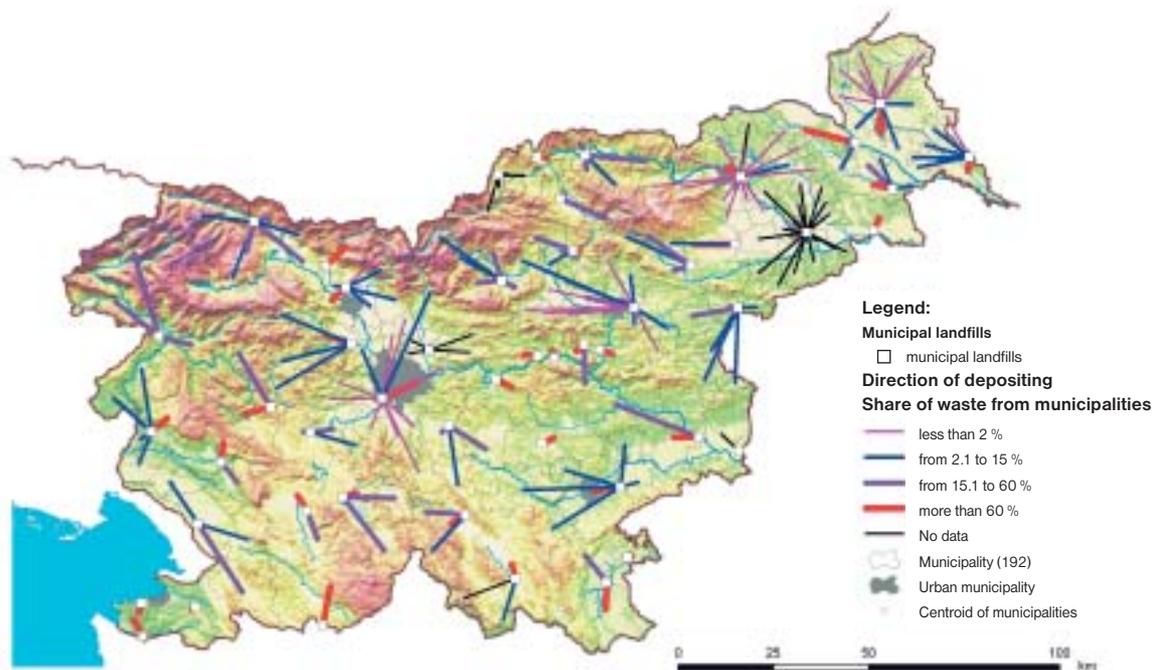


Both the Environmental Agency of the Republic of Slovenia and Statistical Office of the Republic of Slovenia data show that in Slovenia approximately 450 kg of municipal waste is generated annually per capita. According to the Statistical Office of the Republic of Slovenia data, the generation of municipal waste was somewhat higher in 1995 and 1998 (512 and 523 kg/capita per annum). But the methodology for collecting data on waste generated was slightly different, so it would be difficult to conclude that the quantity of waste generated had fallen. We will be able to observe the real trend in municipal waste generation only in the coming years when we have applied the same methodology for several years and the system for separate municipal waste collection will be set up completely. According to the 2002 data, 411 kg of municipal waste per capita were generated in Slovenia.

According to the EEA (European Environment Agency) data, the trend in municipal waste generation is rising in EU Member States. The Fifth Environmental Action Programme set out a goal of stabilising the municipal waste generation across the EU at 300 kg/capita per annum by 2000. In 1999, the average quantity of municipal waste generated within EU Member States was approximately 500 kg/capita per annum.

Picture 33-2: Share of waste from the municipalities on the municipal landfills

Source: Surveying and Mapping Authority of the Republic of Slovenia; Environmental Agency of the Republic of Slovenia, 2003; Anton Melik Geographical Institute



DATA AND SOURCES

Table 33-1: Generation of municipal waste per capita in Slovenia and the EU-15

Source: Waste Management Database, Environmental Agency of the Republic of Slovenia, 2003; Statistical Yearbook 2000, 2001, 2003, Statistical Office of the Republic of Slovenia; Municipal waste generation per capita, Indicator Fact Sheet. European Environment Agency, 2002

	unit	1995	1996	1997	1998	1999	2000	2001	2002
EU-15	kg per capita	478	495	489	520	533	n/a	n/a	n/a
Slovenia (SORS data)	kg per capita	515	n/a	n/a	523	n/a	n/a	448	411
Slovenia (EARS data)	kg per capita	n/a	n/a	n/a	n/a	n/a	n/a	450	411

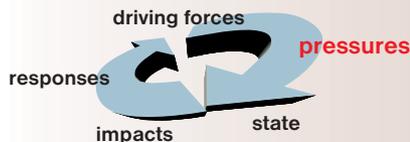
The Ministry of the Environment, Spatial Planning and Energy – Environmental Agency of the Republic of Slovenia has been monitoring the generation of municipal waste since 2001. In line with the Order on the Management of Separately Collected Fractions in the Public Service of Urban Waste Management (OJ RS No 21/01) the municipal waste collection service providers report to the Environmental Agency of the Republic of Slovenia once a year (31 March) on prescribed Environmental Agency of the Republic of Slovenia forms on the collected volumes of municipal waste. Checks are made of contents of every completed form. Where shortcomings are identified, the data are adjusted in consultation with the entity liable. Data from the reports are entered into the Waste Management Database. The quantity of municipal waste generated was arrived at from data on quantities collected.

Quantities of municipal waste generated are also monitored by the Statistical Office of the Republic of Slovenia via three-year research programmes. In 1995 and 1998, the Statistical Office of the Republic of Slovenia monitored the generation of municipal waste in accor-

dance with the EUROSTAT definitions. In 2001 and 2002, the Statistical Office of the Republic of Slovenia carried out research on the generation of municipal waste in line with the provisions and reporting prescribed by the Order on the Management of Separately Collected Fractions in the Public Service of Urban Waste Management.

Data were used for those EU countries where available (Belgium, Denmark, Italy, Luxembourg, Netherlands, Portugal, Spain and the United Kingdom). The data source is Municipal waste generation per capita, Indicator fact sheet. European Environment Agency, 2002. Original data used in the indicator fact sheet have been taken from the Eurostat New Cronos Database (Eurostat-OECD JQ 2000). Data were collected by means of so-called Joint Questionnaires (JQ 2000) and the study Household and Municipal Waste: Comparability of Data in EEA Member Countries, Topic report No 3/2000, European Environmental Agency, European Topic Centre on Waste, 2000, which was prepared on the basis of questionnaires and national reports to the EEA and of EUROSTAT data.





34. DISPOSED NON-HAZARDOUS WASTE

This indicator shows the quantity of non-hazardous waste disposed into non-hazardous waste landfills in Slovenia. Non-hazardous waste is deemed to be all waste that is not classified among hazardous-waste. The waste classification list was published in the Annex to the Rules on the Management of Waste (OJ RS No 84/98, 45/00, 20/01, 13/03).

The disposal of waste, as a waste removal procedure, is only an appropriate form of final treatment for those types of waste that cannot be recovered or put to use in some other manner. Individual types of waste must be disposed into appropriate types of landfills.

GOAL

The main objectives of the National Environmental Action Programme in the area of waste disposal are the reduction in generation of waste at source, increase in the material and energy recovery of waste and decrease of greenhouse gas emissions. The Rules on the Landfill of Waste (OJ RS No 05/00, 43/04) represent a legal basis for the attainment of the aforementioned objectives.

Figure 34-1: Quantities of non-hazardous waste disposed

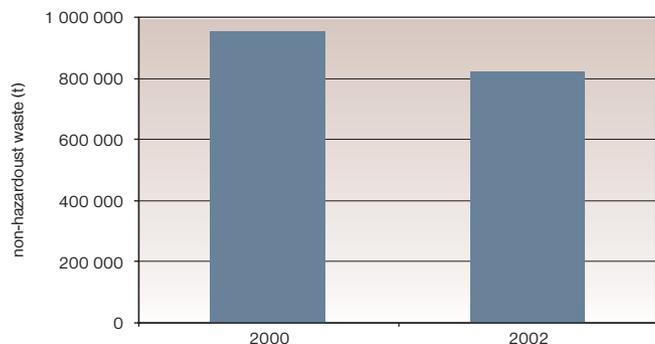


Figure 34-2: Structure of non-hazardous waste disposed in 2002

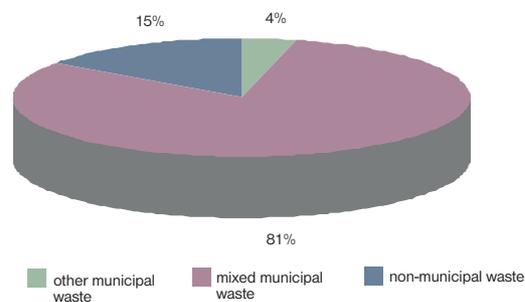
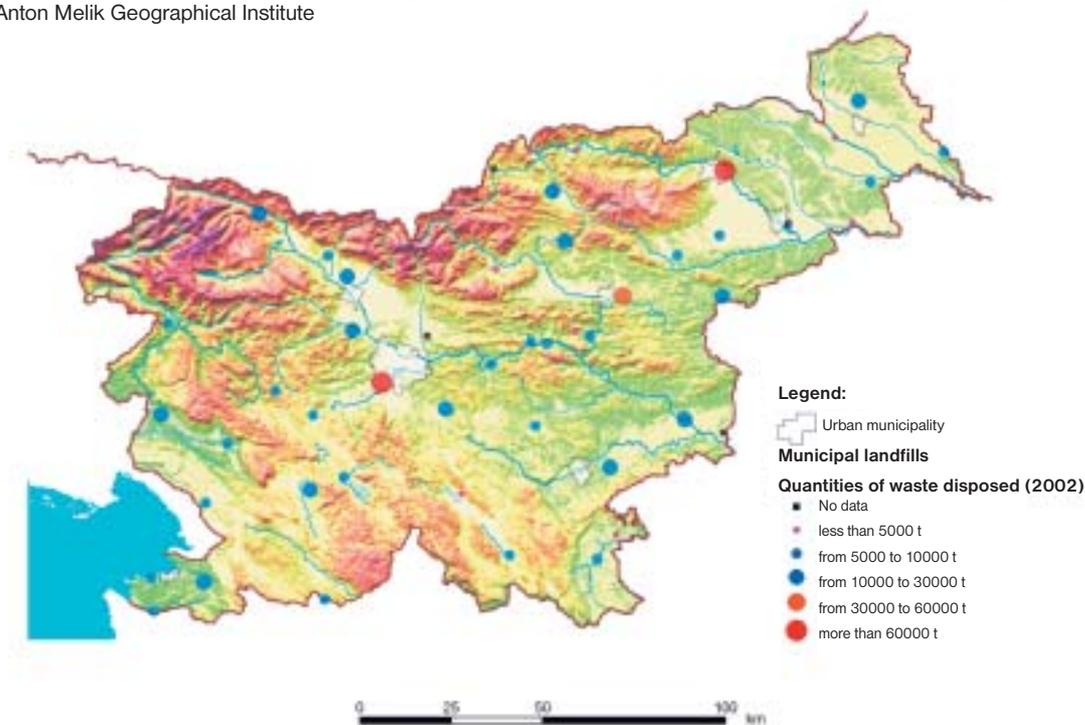


Figure 34-3: Non-hazardous waste landfills and the amount of waste disposed in 2002

Source: Waste Management Database, Environmental Agency of the Republic of Slovenia, 2003; Surveying and Mapping Authority of the Republic of Slovenia; Anton Melik Geographical Institute



According to the official records of the Environmental Agency of the Republic of Slovenia, there were 48 non-hazardous waste landfills active in Slovenia and 3 under construction by the end of 2002. 40 non-hazardous waste landfills operate after 2003.

According to the Environmental Agency of the Republic of Slovenia data on quantities of disposed non-hazardous waste, which are also comparable for 2002 with the data of the Statistical Office of the Republic of Slovenia, the quantity of disposed non-hazardous waste decreased in 2002 by approximately 14 % in comparison with 2000.

The share of municipal waste in the total quantity of non-hazardous waste disposed amounted to approximately 85 % in 2002, of which the major share (81 %) was from mixed municipal waste, the remaining share representing waste from gardens and separately collected fractions. The share of other non-municipal waste disposed from activities (construction waste, packaging waste, waste from waste treatment facilities, inorganic waste from thermal processes, waste from organic chemical processes, waste from manufacture of wood and paper and other waste), which by its characteristics is non-hazardous waste, amounted to approximately 15 %.

DATA AND SOURCES

Table 34-1: Quantities of non-hazardous waste disposed

Source: Waste Management Database, Environmental Agency of the Republic of Slovenia 2003, Statistical Office of the Republic of Slovenia, 2003

	unit	2000	2002
disposed non-hazardous waste	t	956 128	822 339

Table 34-2: Structure of non-hazardous waste disposed in 2002

Source: Waste Management Database, Environmental Agency of the Republic of Slovenia 2003, Statistical Office of the Republic of Slovenia, 2003

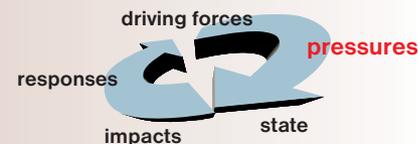
	unit	2002
mixed municipal waste	%	81
other municipal waste	%	4
non-municipal waste	%	15

The Ministry of the Environment, Spatial Planning and Energy – Environmental Agency of the Republic of Slovenia has been monitoring the quantity of disposed waste since 2001. Landfill managers reported on the quantity of disposed waste for the first time in 2000. Data are collected on the basis of the Decree on the Waste Disposal Tax (OJ RS No 70/01, 05/03, 09/04, 13/04) setting out that landfill managers and entity liable for the payment of tax, respectively, are obliged to report, by 31 October 2001 at the latest, on types and quantities of disposed waste from the disposal records of the liable entity for the year 2000 in accordance with the provision on waste management, as well as from 2003 onwards to file a tax return for the previous calendar year containing all relevant data. Landfill managers, who are liable for the payment of tax, are obliged to submit to the Environmental Agency of the Republic of Slovenia the aforementioned tax return for the previous calendar year on a prescribed form published in the Official Journal by 31 March of the current year at the latest. Data are entered into the Waste Management Database. Here checks are made on the completeness and quality of data.

The quantity of removed and disposed, respectively, non-hazardous waste in landfills is also monitored by the Statistical Office of the Republic of Slovenia via three-year research programmes. Until 2000, the reporting of landfill managers was implemented separately, namely as reporting to the Ministry of the Environment, Spatial Planning and Energy – Environmental Agency of the Republic of Slovenia and as reporting to the Statistical Office of the Republic of Slovenia. In 2002, the reporting methodology was unified between the two national institutions (Environmental Agency of the Republic of Slovenia, Statistical Office of the Republic of Slovenia). In so doing the processing of data which landfill managers are obliged to submit in accordance with the provisions of the Rules on the Management of Waste (OJ RS No 84/98, 45/00, 20/01 and 13/03) was also unified. As waste removers, landfill managers are obliged, to submit a report on waste removal and disposal by 31 March at the latest for the previous calendar year on a prescribed form. Concerning the observing of time limits set for the reporting by liable persons, the provisions of the Rules on the Landfill of Waste (OJ RS No 05/00, 43/04) apply setting out that landfill managers are obliged to draw up the Rules of procedure by 31 December 2000 containing, among other things, the quantities and types of waste which may be disposed in accordance with the permit, as well as to ensure the maintenance of records on quantity, type and owner of waste received by 31 December 2001 at the latest.

In 2002, utilising a unified methodology the Statistical Office of the Republic of Slovenia conducted a survey on the quantity and type of non-hazardous waste disposed into municipal waste landfills.

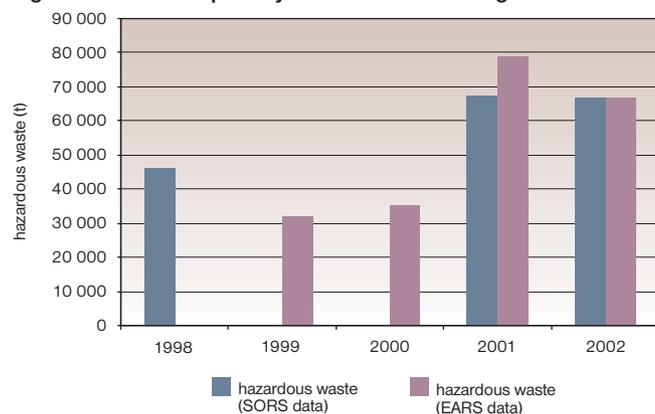




35. GENERATION OF HAZARDOUS WASTE

Hazardous waste has one or more hazardous properties which are harmful to health and/or the environment (e.g. inflammable, irritant, poisonous, mutagenic and so forth). The waste list is published in the Annex to the Rules on the Management of Waste (OJ RS No 84/98, 45/00, 20/01, 13/03) where hazardous waste is marked with a star next to the waste classification number.

Figure 35-1: Total quantity of hazardous waste generated



The quantities of hazardous waste are growing according to data from both the Environmental Agency of the Republic of Slovenia and the Statistical Office of the Republic of Slovenia. The Environmental Agency of the Republic of Slovenia data show in particular a large increase in the generation of hazardous waste in 2001 compared to 2000, namely by 43 503 t, which is the result of an incident, i.e. the removal of a large single quantity of hazardous waste. In 2002, 66 779 t of hazardous waste were generated in Slovenia. The data held by the Statistical Office of the Republic of Slovenia also indicate an increase in the generation of waste from 1998 to 2002. From this it is possible to conclude that the generation of hazardous waste has increased. In part the increase can also be ascribed to the changed reporting methodology, since in 2001 the waste classification list changed and there was also an increase

GOAL

One of the main National Environmental Action Programme targets in this area is reducing the quantity of hazardous waste and the hazard potential of waste at source. This area is governed by the Rules on the Management of Waste (OJ RS No 84/98, 45/00, 20/01).



in the number of liable entities who reported. This is linked to the implementation of waste management regulations and joint collection of data (Statistical Office of the Republic of Slovenia, Environmental Agency of the Republic of Slovenia). At the same time we have observed that the export of hazardous waste has also grown with an increase in 2001 of 3 000 t over 2000. In 2001 and 2002, only a slight increase in the export of waste was registered.

According to EUROSTAT and EEA data, the Member States and associate members hold incomplete data on hazardous waste generation. There was a modest improvement in the situation after 1995. The data show that in the EU Member States hazardous waste generation is growing as well.

DATA AND SOURCES

Table 35-1: Total quantity of hazardous waste generated

Source: Waste Management Database, Environmental Agency of the Republic of Slovenia, 2003, Statistical Yearbook 2000, 2003, Statistical Office of the Republic of Slovenia

	unit	1998	1999	2000	2001	2002
SORS data	t	46 265	n/a	n/a	67 521	66 779
EARS data	t	n/a	31 970	35 382	78 885	66 779

The Ministry of the Environment, Spatial Planning and Energy – Environmental Agency of the Republic of Slovenia – has been monitoring the generation of hazardous waste since 1999. The liable entities reported on hazardous waste generation for 1999 for the first time in 2000. Data are collected on the basis of the Rules on the Management of Waste (OJ RS No 84/98, 45/00, 20/01 and 13/03), which provide that:

- waste producers, who in an individual calendar year generate at least 5 kg of hazardous waste, must submit a report on the waste produced and its handling for the previous calendar year and
- collectors must submit a report on hazardous waste collected and its handling for the previous year.
- Processors and removers of hazardous waste must submit a report on waste processing carried out in the previous calendar year.

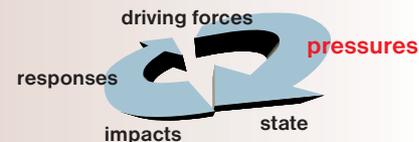
The above reports must be sent by liable persons to the Environmental Agency of the Republic of Slovenia on a prescribed form by 31 March of the current year at the latest.

In 2001, the waste classification list was changed in line with the change in European legislation which introduced a new waste list. Therefore, liable persons sent reports on hazardous waste generation in line with the new classification list.

Data from the reports are entered into the Waste Management Database. Checks are made whether liable persons actually reported and missing reports have been obtained. Checks are made of contents of every completed form. Where shortcomings are identified, the data are adjusted in consultation with the liable person.

The quantities of hazardous waste generated are also monitored by the Statistical Office of the Republic of Slovenia, namely in three-year research programmes. In 1998, the Statistical Office of the Republic of Slovenia monitored hazardous waste generation in accordance with the waste classification list published in the Rules on the management of waste in 1998. In 2001, however, the Statistical Office conducted research on hazardous waste generation in line with the classification list published in 2001. In 2002, the entry of data was unified by Environmental Agency of the Republic of Slovenia and Statistical Office of the Republic of Slovenia.

36. TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTE



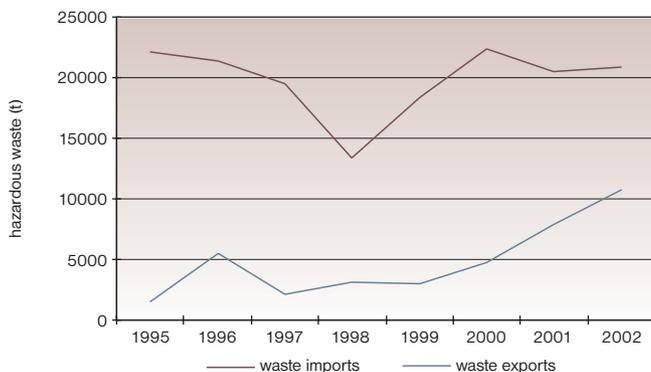
The purpose of this indicator is to show the progress in connection with the reduction of movements of hazardous waste across borders and the self-sufficiency of the country in terms of ensuring recovery or disposal of hazardous waste as close as possible to the location of its production as well as limiting to the greatest extent possible the generation of hazardous waste (in quantity and also in terms of the degree of harmfulness).

The indicator is shown as the total amount of hazardous waste imported for the purposes of recovery and hazardous waste exported to other countries for the purposes of recovery or disposal.

GOAL

The National Environmental Action Programme envisages reducing the quantity of hazardous waste and hazard potential of waste at source, as well as consistent implementation of international obligations. This area is regulated in detail by the Act Ratifying the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (OJ RS-MP No15/93 and 2/00), the Order on the Export, Import and Transit of Wastes (OJ RS No 39/96, 45/96, 1/97, 59/98, 1/00 and 94/00) and the Decision on Determining Border Crossings Across Which Hazardous Waste May Be Brought In, Taken Out or Transported In Transit Across the Customs Territory of the Republic of Slovenia (OJ RS No 11/97).

Figure 36-1: Quantity of hazardous waste imported into and exported out of Slovenia



In accordance with the implementation of the provisions of the Basel Convention, Slovenia monitors the transport of hazardous waste. Every shipment of hazardous waste must be declared in advance and must have all appropriate permits from the exporting country, importing country and countries of transit. In the event of an EU Member State being affected, account must also be taken of the European Council Regulation (EEC) No 259/93 of 1 February 1993 on the Supervision and Control of Shipments of Waste Within, Into and Out of the European Community, which governs this area and has a broader framework since it incorporates the Basel Convention, the OECD Council Decision on Transboundary Transport of Waste and the recommendations of the Lome Conference.

The import of hazardous waste into Slovenia for the purposes of disposal is prohibited. The import of hazardous waste is permitted only if the waste will be recovered in an environmentally safe way and the exporting country consents to the intended movement of hazardous waste. The export of hazardous waste from Slovenia is permitted, among other restrictions, only if technical capacities and necessary facilities for the disposal of such waste in an environmentally safe way do not exist in the territory of the Republic of Slovenia.



The quantities of hazardous waste imported in recent years have remained fairly constant with the exception of 1998. In 2002, the largest quantity that was imported was waste lead batteries imported for processing at Rudnik Mežica MPI, and came from Croatia, Hungary and some from Romania and Bosnia-Herzegovina. In recent years, a certain amount of acids and base solutions has also been imported for recovery at the Cinkarna Celje.

The export of hazardous waste has grown slightly in recent years. In 2002, exports were predominantly of paint and varnish sludge, followed by non-halogenated organic solvents, halogenated organic solvents, waste tarry residues, waste from thermal processes, transformers and capacitors containing PCB's and PCT's, waste mineral oils and emulsions, used batteries and waste containing copper, zinc and cadmium compounds and mercury, respectively.

DATA AND SOURCES

Table 36-1: Quantity of hazardous waste imported into and exported out of Slovenia

Source: Transboundary Movements of Wastes Database, Environmental Agency of the Republic of Slovenia, 2003

	unit	1995	1996	1997	1998	1999	2000	2001	2002
waste imports	t	22 124	21 405	19 506	13 359	18 435	22 326	20 495	20 889
waste exports	t	1 553	5 534	2 142	3 171	2 960	4 702	7 887	10 726

Hazardous waste, in the case of import and export and in accordance with the Act Ratifying the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (OJ RS No15/93 and 2/00), is:

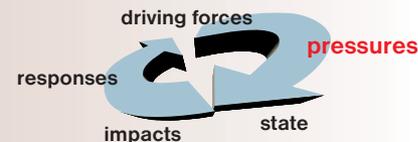
- waste falling into any category set out in the addendum I to the Basel Convention, unless it has none of the characteristics set out in the addendum III to the Basel Convention (does not demonstrate hazardous properties) and
- waste not covered by the first point but determined as such or deemed to be hazardous waste according to the national legislation of the country of export, import or transit.

A party that has obtained a permit for the import or export of hazardous waste must, no later than 180 days from the day the individual shipment of hazardous waste was delivered to the disposer in the country of import,

submit to the Environmental Agency of the Republic of Slovenia confirmation from the disposer (confirmed movement form) of its disposal. The movement form shows the date of transportation, the delivery and receipt of hazardous waste at the disposer's location and the date of disposal of waste and quantity of transported, delivered, received and disposed hazardous waste.

The data from the movement forms on the effected disposal of hazardous waste are entered into the Transboundary Movements of Wastes Database, which also records all permits issued. The data allow us to keep records on actual quantities of hazardous waste imported and exported for individual permits issued, as well as to report to the Secretariat of the Basel Convention in compliance with Articles 13 and 16 of this convention. The thus obtained data on permitted transits of hazardous waste across the border are reliable and accurate.



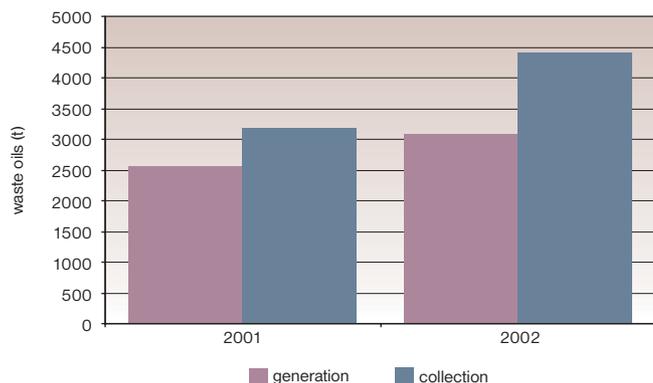


37. GENERATION AND COLLECTION OF WASTE OILS

This indicator shows the annual quantities of waste oils generated and collected. Waste oils are any mineral or synthetic oils in liquid or semi-liquid state which are no longer suitable for their intended use, in particular: hydraulic oils, motor, machining or other lubricating oils, oils or liquids for thermal insulation or heat transfer, bilge oils and other mineral or synthetic oils, with the exception of waste oils which are mechanically treated by the producer at a facility at the location of their generation in such a manner that they can be reused for the same purpose (OJ RS No 85/98) within 12 months following their generation at the latest.



Figure 37-1: Quantity of waste oils generated and collected in Slovenia



GOAL

The objective of the National Environmental Action Programme is the establishment of an efficient waste management system which also includes the waste oil management system. The area of waste oil management is governed by the Rules on the Management of Waste (OJ RS No 84/98, 45/00, 20/01 and 13/03) and the Rules on Waste Oil Management (OJ RS No 85/98).

In Slovenia, the basic system for collection, recovery and disposal of waste oils was established in 1998. The main guidelines and requirements for the drawing up of an action programme regarding waste oil management are laid down in applicable Slovenian regulations in the field of waste management, in particular the Rules on Waste Oil Management which are harmonized with the EU directive on waste oil disposal.

The mixing of waste oils with other hazardous waste and substances containing PCB is prohibited. Producers are obliged to deliver their waste oils to collectors unless they hold a permit for disposal and recovery, respectively. They are obliged to arrange for an appropriate place of delivery. Owners of waste oils may deliver their waste oils to waste collection facilities. The collection of waste oils may be performed only by collectors holding appropriate permits issued by the Ministry. All collectors are obliged to provide a collection centre and ensure the reuse or disposal of collected waste oils. In 2003, there were 7 waste oil collectors operating in Slovenia. The reuse of waste oils where there exist technical possibilities and the costs of reuse are not disproportionately higher than the costs arising from disposal, takes precedence over disposal.

The quantity of waste oils generated and collected is increasing. We presume that the difference between generated waste oils and collected waste oils arises from incomplete recording by liable entities, in particular producers (2000 is the first reporting year in accordance with the requirements of the Rules on the management of waste). Producers whose annual quantity of waste oils generated totalled less than 20 kg were also not obliged to report.

DATA AND SOURCES

Table 37-1: Quantity of waste oils generated and collected in Slovenia

Source: Management of Waste Oils in the Republic of Slovenia (Annual reports for 2001/2002), Environmental Agency of the Republic of Slovenia, 2003

	unit	2001	2002
generation	t	2 576	3 073
collection	t	3 168	4 404

Data sources are the Waste management database of the Ministry of the Environment, Spatial Planning and Energy – Environmental Agency of the Republic of Slovenia (2001, 2002) and annual reports submitted by the collectors of waste oils, Environmental Agency of the Republic of Slovenia (2001, 2002).

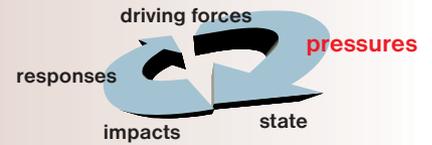
The data on waste generation are collected on the basis of the Rules on the Management of Waste (OJ RS No 84/98, 45/00, 20/01 and 13/03). The aforementioned Rules set out that those producers of waste who produce more than 5 kg (20 kg until 2000) of hazardous

waste in an individual calendar year are obliged to submit reports on waste generated and its handling. The waste collection data are collected on the basis of the Rules on Waste Oil Management (OJ RS No 85/98). Liable entities are obliged to submit the aforementioned reports to the Environmental Agency of the Republic of Slovenia by 31 March of the current year. Under these Rules, any person carrying out activities generating waste oils is obliged to ensure proper recovery and storage of waste oils so as to prevent environmental pollution, as well as to deliver waste oils to a qualified collector who ensures their reuse or disposal.

Data from the reports on hazardous waste generation are entered into the database. The annual report on waste oil collection is drawn up on the basis of waste collection reports.

Checks are made of contents of every completed form on hazardous waste generation. The data from the waste oil collection reports are verified with the Environmental Agency of the Republic of Slovenia. Checks are made whether liable entities actually reported and the missing reports have been obtained.





38. DIRECT MATERIAL INPUT

The Direct Material Input (DMI) represents the total weight of all solid, liquid and gaseous materials (with the exception of water and air which are not directly contained in material) entering production and consumption processes. Direct material flows are divided according to geographical origin into: materials obtained from nature at home and imported materials. Material inputs of domestic origin are further divided into three main groups: fossil fuels, minerals (metallic and non-metallic) and biomass.

The definition and methodological presentation of the DMI are taken from the methodological guidelines of the Wuppertal Institute applied by EUROSTAT and the European Environment Agency.

GOAL

In its section "Industry and Mining", the National Environmental Action Programme announces measures for ensuring sustainable use of natural resources. The European Union Strategy for Sustainable Development (A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development) sets the severing of links between economic growth, use of resources and waste production as one of its principal objectives in relation to a more responsible natural resources management.

Figure 38-1: Direct Material Input (DMI) in Slovenia

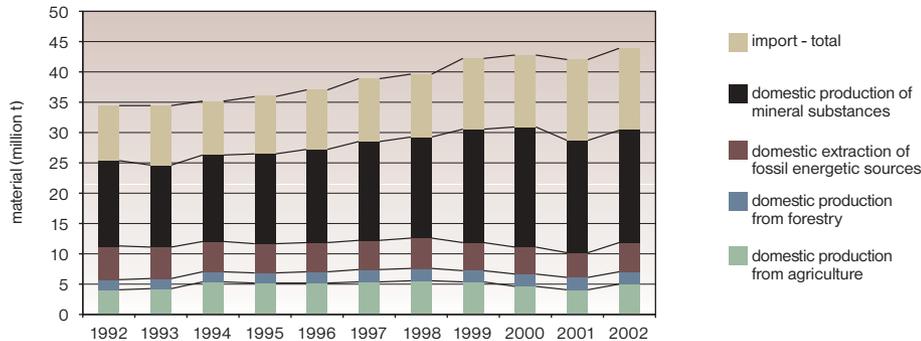
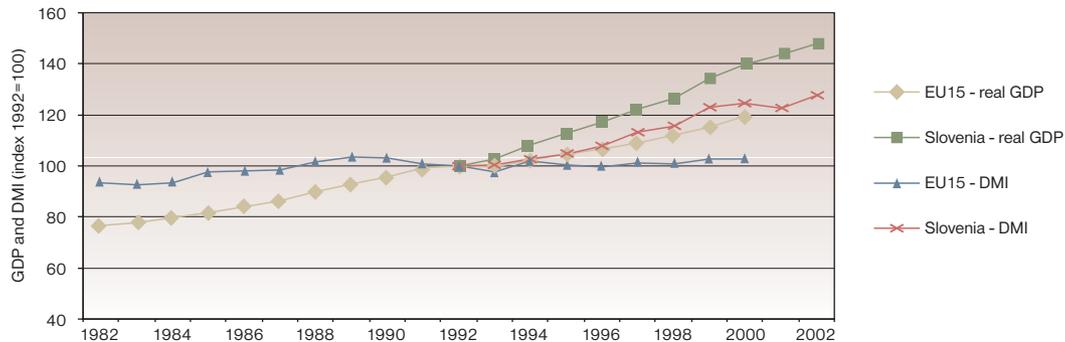


Figure 38-2: Comparison of real GDP and DMI trends in Slovenia and the EU-15



Direct Material Input (DMI) is an aggregated indicator showing the total weight of materials used by a certain economy (or country) for its operation over a certain period of time. The monitoring of DMI represents one of the tools for the monitoring of development of use of natural resources or a broadly represented use of the so called "environmental space".

In 2002, Slovenia produced and imported a total of just under 44 million tons of various materials. Almost a half (42 %) represent the mineral materials obtained in Slovenia, mostly technical stone and gravel and sand which are being installed in facilities. The quantity of raw materials for building construction obtained in Slovenia increased by one half in the period from 1993 to 2001 and contributed a major part to the increase in material use per capita (DMI per capita). The latter increased from 17.2 tons in 1992 to 22 tons in 2002. A substantial increase was also perceived in the total weight of imported goods which represent almost one third of all materials used in a year. The share of the domestically obtained rapidly renewable materials in the form of biomass, i.e. agricultural products, catch and wood biomass, represents ne-

arly one fifth of all materials and a quarter (rough assessment) of imported materials.

Due to a still rather indeterminate methodology of DMI representation, the data for comparison with the EU are only conditionally appropriate, however they undeniably attest to the fact that in the 1990's the DMI per capita was rather stable in the EU (approximately 19 tons and, according to another source, approximately 17 tons, respectively, per capita), while the total quantity of materials imported into Slovenia is increasing rather rapidly. This is related to the economic development in Slovenia, a fact which can be deduced from the comparison with the real GDP trend which is increasing slightly faster than DMI. Similar development was taking place in the 1980's in the countries today forming the EU. A relative separation of trends of DMI and GDP can be perceived, i.e. the so called "decoupling" phenomenon which represents one of the priorities of the European Union Strategy for Sustainable Development, which is mainly a result of the increase in the share of service activities in GDP.

DATA AND SOURCES

Table 38-1: Direct Material Input (DMI) in Slovenia

Source: FAOSTAT, FAO, 2004; Statistical Databank, Statistical Office of the Republic of Slovenia, 2004; Statistical Yearbook of the energy economy of the RS, Ministry of the Environment, Spatial Planning and Energy, 2003; Mining Sector (own calculations), Ministry of the Environment, Spatial Planning and Energy, 2003; InterISPO

	unit	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
domestic production from agriculture	million t	4.1	4.2	5.3	5.1	5.2	5.3	5.6	5.4	4.6	4.1	5.0
domestic production from forestry	million t	1.7	1.7	1.8	1.7	1.8	2.1	2.0	1.9	2.1	2.1	2.1
domestic extraction of fossil energetic sources	million t	5.6	5.1	4.9	4.9	4.8	5.0	4.9	4.6	4.5	4.2	4.7
domestic production of mineral substances	million t	13.9	13.6	14.2	14.8	15.5	16.1	16.8	18.7	19.8	18.5	18.5
total import	million t	9.1	9.9	9.2	9.4	9.8	10.5	10.4	11.7	11.8	13.3	13.6
total direct material input (DMI)	million t	34.4	34.4	35.3	36.0	37.1	38.9	39.7	42.3	42.7	42.1	43.9

Table 38-2: Comparison of real GDP and DMI trends in Slovenia and the EU-15

Source: FAOSTAT, FAO; Statistical Databank, Statistical Yearbook of the RS, Statistical Office of the Republic of Slovenia; Statistical Yearbook of the energy economy of the RS, Ministry of the Environment, Spatial Planning and Energy; Mining Sector (own calculations), Ministry of the Environment, Spatial Planning and Energy; InterISPO; European Topic Centre on Waste and Material Flow: Zero Study Resource Use in European Countries, 2003; Material use in the European Union 1980-2000. Indicators and Analysis. Working Papers and Studies, 2002, Eurostat; Eurostat New Cronos database

	unit	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
EU-15 - real GDP	index (1992 = 100)	77	78	80	82	84	86	90	93	96	99
Slovenia - real GDP	index (1992 = 100)	n/a									
EU-15 - DMI	index (1992 = 100)	93	92	93	98	98	99	102	104	103	101
Slovenia - DMI	index (1992 = 100)	n/a									

	unit	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
EU-15 - real BDP	index (1992 = 100)	100	100	102	105	106	109	112	115	119	n/a	n/a
Slovenia - real BDP	index (1992 = 100)	100	103	108	113	117	122	127	134	140	144	148
EU-15 - DMI	index (1992 = 100)	100	98	102	100	100	101	101	103	103	n/a	n/a
Slovenia - DMI	index (1992 = 100)	100	100	103	105	108	113	116	123	124	123	128

Data for Slovenia

The methodology of the DMI presentation for Slovenia is taken from Bringezu Stefan, Schütz (Wuppertal Institute): Total material requirement of the European Union, Technical report No 56. European Environment Agency.

The data for agricultural production are taken from the FAOSTAT database, revised by the Statistical Office of the Republic of Slovenia data and coefficients provided by the Wuppertal Institute.

The data on the extraction of fossil fuels are taken from the Statistical Yearbook of the energy economy of the RS. The data on the extraction of mineral non-metallic raw materials were provided by the Ministry of the Environment, Spatial Planning and Energy - Mining Sector and the Commission of the Republic of Slovenia for Identifying Mineral Ore and Ground Water Reserves, respectively, which obtained the data from forms completed by the holders of mining rights for the extraction of mineral raw materials. They were calculated into tons with the average dry bulk density for raw materials. The data were processed by the Slovenian Geological Institute. Data are available for 1983, 1988, 1993, 1998, 1999, 2000 and 2001, while the quantities for other years were assessed using linear interpolation.

The data on imports are taken from the Statistical Office of the Republic of Slovenia: Statistical Databank (1992-1994 and 1998-2002)

and transmitted from the InterISPO (1996, 1997) application; the data for 1995 represents an assessment obtained by linear interpolation.

The data on population and GDP are taken from the Statistical Office of the Republic of Slovenia: Statistical Yearbook of the RS 2003 and the data from the www.stat.si web page.

Data for other countries

EU-15 represents the EU Member States in the period prior to 1 May 2004. The collective data for these countries are also shown for the period prior to their accession to the EU.

EEA Fact Sheet: Total Material Requirement, 2002. Wuppertal Institute.

Eurostat.; Weisz, H.; Fischer-Kowalski, M.; Amann, C.; Eisenmenger, N.; Erb, K.; Hubacek, K.; Krausmann, F.; Schulz, NB. (2002): Material use in the European Union 1980-2000. Indicators and Analysis. Working Papers and Studies. Luxembourg: Eurostat (Working papers and Studies).

European Topic Centre on Waste and Material Flow: Zero Study Resource Use in European Countries, 2003.

Eurostat New Cronos database

