

THE SANITATION ACTIVITY CARRIED OUT BY S.C. RETIM ECOLOGIC SERVICE S.A. IN TIMIȘOARA MUNICIPALITY

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Abstract. Maintaining the human-nature balance, simultaneously with economic and social progress, a basic concept of sustainable development, is the solution of the two opposite trends: economic growth and protection of environmental resources. This means eliminating current forms of waste and increasing the quality of the environment. The overall objective of sustainable waste management is to prevent and rationally reduce the potential negative impact on the natural environment. Responsibility for waste management activities rests with their generators in accordance with the "polluter pays" principle or, as the case may be, with producers in accordance with the "producer responsibility" principle. Organizing the activities of collecting, transporting and disposing of municipal waste is one of the obligations of local public administrations. In order to meet the national and European objectives in the field of waste management, it is necessary to involve, practically, the whole society, represented by: central and local public authorities (environment, administration, health, industry, finance); waste generators (individuals and legal entities); local sanitation operators; professional associations and research and development institutes; civil society (consumers of goods, non-governmental organizations, etc.). The greening of localities, generally understood as sanitation activity, aims to achieve and maintain the hygiene of an urban or rural settlement, on which depends largely the quality of life of the population. In accordance with Law no. 139/2002 for the approval of the Government Ordinance no. 87/2001 regarding the public sanitation services of the localities, the sanitation is "a local public service of communal management, organized, coordinated, regulated, led, monitored and controlled by the local public administration authorities". The attributions of this service have in view: the collection, transport and storage of solid residues, except for toxic, hazardous residues and those with special regime; administration of ecological, compliant landfills, sweeping, washing of public roads, cleaning and transporting snow from public roads and maintaining them in operation during frost or frost. As a result, urban greening is an activity that must contribute to preserving the values of the environment, the health of the population and a civilized living environment. This paper describes the sanitation activity performed by S.C. RETIM Ecologic Service S.A. within the municipality of Timișoara, following the route of waste from collection, transport to recovery or final storage on a compliant landfill. The mechanisms of municipal waste management are presented, together with the methods used by S.C. RETIM Ecologic Service S.A. in order to be able to achieve the concept of "zero waste" in the future.

Keywords: sanitation, efficiency, waste management, recovery, storage, zero - waste

INTRODUCTION

In the context of increasing urbanization and population growth, an efficient and efficient waste management system is needed to maintain a high quality of life. The importance of personal example in a community cannot be neglected, and RETIM Ecologic Service has shown in these years of activity in Timișoara and its surroundings that citizens can be motivated to work with the authorities for the common good of the community.

From the perspective of time, the beginnings of the sanitation of the municipality date back to 1909, when the Timișoara City Hall had as main attributions in the field of sanitation the street cleaning, the transport of the street and household garbage, the spraying of the streets. In order to solve all the problems of the city administration, the Timișoara City Hall gathered in 1911 all the municipal services in a unitary formula: the Timișoara Communal Enterprise. This was the first such communal economic enterprise on the current territory of Romania. On May 7, 1938, the Romanian Parliament adopted a new law for the organization of Communal

Exploitation in Romania. In fact, it is about the reorganization of some communal enterprises of public utility, which will take over, organize and follow the public utility activities of each locality.

In Timișoara, three public enterprises of the mayor's office were thus established: the Electromechanical Enterprise, the Economic Establishments and the Enterprise for water supply, sewerage, chimney sweeping and sanitation, in short ITAS. ITAS consisted of three sections: one for water supply, another for sewerage and a third for sanitation. This section was responsible for cleaning the city and transporting waste. On August 27, 1949, the Provisional Council of the urban commune of Timișoara decides to establish a new form of urban public service, which will replace the old ITAS. This service was called the Communal Enterprise of the City of Timișoara and had as object of activity water supply, sewerage, public baths, sanitation, chimney sweeping and public transport by trams and trolleybuses.

Law no. 15 / 07.08.1990, called the Law on Autonomous Utilities, provided for the transformation of state economic units into autonomous utilities and companies. These were set up by the government, in the strategic sectors of the Romanian economy, and by the local public administration authorities, for the good administration of the respective localities. The sanitation company had to cover all its operating and operating expenses from its own revenues. The director had the possibility of associating with third parties, in order to carry out joint activities. This did not lead to the establishment of a new legal entity. The establishment of the latter was achieved only when the association led to the establishment of a company.

Law 69/1991 invested the Local Councils with the responsibility of providing all public services to the population, ensuring them financial autonomy. This, however, was drastically limited by the Public Finance Law no. 10/1991. The Timișoara Local Council established regulations on sanitation, organized and led the respective service, tried to invest funds from the local budget. Decision no. 597 / 28.09.1992 decided the transfer under the authority of the Local Councils of the autonomous utilities and of the commercial companies with state capital that provide public services of local or county interest. Decision of the Timișoara Local Council no. 45/1993 contains the norms for each of the municipal activities and stipulates that the administration of household waste is within the competence of the Timișoara Autonomous Sanitation Authority (RAST).

By the Decision of the Timișoara Local Council no. 244 of May 21, 1996, the association of the Sanitation Authority with the companies RER-RWE Entsorgung Romania SRL, RER-RWE Entsorgung Prague was approved, and by the Decision of the Local Council no. 10 of July 16, 1996, it was decided to establish a joint venture called S.C. RETIM-RWE ECOLOGIC SERVICE S.A.

At the beginning of 1997, the RWE group withdrew and ceded the shares of the German concern RER - Ecological Recovery and Recycling. SC RETIM Ecologic Service S.A. is part of the RER Romania S.R.L. group, together with REBU Bucharest, RER Ecological Service Oradea, RER Ecological Service Buzau, RER Ecological Service Galati and RER Ecological Service Brăila.

The company's object of activity is household sanitation for the population, economic agents, institutions and public administrations, street sanitation and snow removal service, construction and management of ecological landfills, selective collection, sorting, recycling, processing and recovery of waste and / or materials. obtained from non-hazardous urban and industrial waste.

SC RETIM Ecologic Service S.A. is a joint stock company, with the following composition:

- Timișoara City Hall - 50%;

- RER Ecological Recovery and Recycling S.R.L. Bucharest - 50%.

Immediately after the establishment, the German investor modernized the waste collection and transport system. Energetic actions of civic and ecological education have begun. The capital contribution, consisting of modern sanitation equipment, led to the expansion of mechanized works and the entry of sanitation in neighborhoods that until then had not benefited from these types of works. RETIM Ecologic Service has diversified its specialized park every year and has increased the number of contracts for the provision of sanitation services, both within the municipality of Timișoara and in the peri-urban communes.

MATERIAL AND METHODS

Collection and transport system for household and similar waste

Consistent in aligning with the requirements of the European Union, RETIM Ecologic Service is in the midst of a campaign to modernize and renew the equipment specific to the sanitation activity, an action that began in 2003. 50 garbage trucks (with capacities of 6, 16, 18, 23 and 25 m.c.), 15 self-propelled trucks, of which eight high-capacity, seven for narrow streets (Boschung type), as well as three vacuum cleaners for squares and pedestrian areas, four 7 m.c. container trucks and 8 container trucks of 22 m.c. and pre-containers, seven front loaders, 12 vans, 12 pre-containers of 28 m.c., 34 tanks of 22 m.c., 110 containers of 7 m.c., 928 containers of 1.1 m.c., 68,824 europubels of 120 and 240 liters. Eight high-capacity hitchhikers were also purchased. All new car equipment meets the requirements of the low level of environmental pollution, the total number of new equipment available to the company is currently 140. Since 2003 RETIM Ecologic Service has invested in equipment located at the level of European Union requirements, on average, 4 million euros annually. The company has a fleet of cars that complies with European pollution standards EURO 5 and EURO 6, consisting of 59 compactors for household sanitation, 47 machines for street sanitation and 33 machines for combating adverse weather events (frost, icy surface, snow).

The categories of waste collected by RETIM Ecologic Service from the municipality of Timișoara classified according to the list of waste established by the Government Decision no. 856 of August 16, 2002 on waste management records and for the approval of the list containing waste are: packaging waste (15 01- packaging including municipal packaging waste collected separately); construction and demolition waste (17 01 - concrete, bricks, tiles and ceramic materials); municipal and similar wastes from trade, industry, institutions, including separately collected fractions (20 01 - separately collected fractions, except 15 01).

One of the main activities of RETIM Ecologic Service is the collection and transport of household waste both from economic agents and from the associations of owners / tenants or individuals. Through the domestic sanitation service, the company serves a number of 298,399 individuals, from the municipality of Timișoara and the neighboring communes. In the municipality of Timișoara are served 269,234 people, representing 33,491 contracts and a number of 8,276 economic agents. The collection of household waste is carried out daily, on predetermined routes, from all customers, individuals or legal entities. The routes are established according to the number of people served, as well as the quantities of waste they produce.

The company provides collection containers on loan for individuals and associations of owners / tenants. For legal entities provide collection containers for rent. Damaged components of containers, and even containers from individuals and homeowners / tenants associations, are also replaced free of charge. In the case of legal entities that own containers rented from RETIM, the replacement is also free of charge. For each type of waste there are specially designed machines and special collection methods.

In order to reduce the volume, the amount of waste subject to storage, but also to increase the degree of their recovery, RETIM selectively collects recyclable waste. The collection of recyclable waste is done on the same day as the collection of household waste, but not by the same truck. There are, however, situations where recyclable waste is collected by the special vehicle that collects household waste. This happens when recyclable waste is found to contain compromised waste for recycling. The waste thus collected is then sorted into categories and reintroduced into the economic circuit by recycling by specialized economic agents.

Implementation of the dual system of household waste collection (dry and wet fraction)

The dual collection consists in the fact that the citizens are urged to throw, differentiated, in special containers, the strictly household waste, respectively the recyclable ones (paper, cardboard, plastic, aluminum cans, PETs). The dual collection offers the possibility to capitalize on recyclable waste, the revenues obtained by the company from this activity contributing to the reduction of sanitation costs and, implicitly, of the money paid by citizens to benefit from this service.

Introduced in 2006 in only one area of the city, the dual collection of "wet trash" and "dry trash", respectively, began vigorously at the end of January 2007. For the implementation of the system and for the efficient collection of recyclable waste, Timisoara it was divided into 12 sectors, of which 6 to the south and another 6 to the north of the Bega canal.

All sectors have been mapped, thousands of contracts have been concluded, many new ones, thousands of encrypted bags and thousands of bins have been handed over to the beneficiaries, on loan, for the collection of recyclable waste. At the same time, citizens with contractual problems (old or even non-existent contracts) were invited to the company's headquarters. The practical action of implementing the dual collection was accompanied by a strong media coverage.

For the dual collection activity, the Municipality of Timișoara was divided into 12 sectors and is served by 8 machines. The collection in "Dual" system is made from containers (120 l, 240 l bins, 1.1 m.c. containers and inscribed bags).

In March 2010, the implementation of the dual collection within the municipality of Timișoara was practically completed. A strong media campaign to raise public awareness of the need for dual waste collection took place during 2010.

The collection is made from the registered europubes, from the owners / tenants' associations and, if necessary, from the economic agents. The collection of recyclable waste from individuals / households is done from inscribed yellow bags. The contract shall specify the instructions for the contents of the containers intended for selective collection.

Selective collection is also done by voluntary contribution to the collection points of glass packaging (green) and paper / cardboard (blue), located in the form of batteries in densely populated areas.

For the collection of waste electrical, electronic and household equipment (WEEE) RETIM Ecologic Service provides four collection points in the city of Timisoara with the following locations:

- collection point - Calea Torontalului no. 94;
- collection point - Str. Energiei no. 3 (Calea Șagului area);
- collection point - Calea Moșniței no. 2;
- collection point - Aleea Avram Imbroane no. 70.

The collection points are equipped with special containers, in which citizens can deposit the following types of waste electrical, electronic and household appliances: large and

small household appliances, computer and telecommunications equipment, lighting equipment, electrical and electronic tools, supervisory and control tools.

The operating schedule of these collection points is Monday - Saturday, between 08.00 - 20.00.

The collection, transport and storage of bulky and non-hazardous waste within the municipality of Timișoara is carried out, by making available to citizens for a fee containers with a capacity of 2, 7 and 22 m.c. Bulky waste is large solid waste (furniture, household and sanitary objects, electronic and household waste, etc.), which cannot be taken over with ordinary municipal waste collection systems, not assimilated to household waste. These types of waste are mainly taken over during the regular ecological actions - General alms cleaning campaign; The general spring cleaning campaign - but they can also be handed over outside these actions at the company's four permanent collection points.

Waste resulting from construction and demolition works, repairs and landscaping of buildings, whether they are dwellings or spaces with another destination in quantities of more than 1 cubic meter is collected for a fee, on the basis of a written order at the Production Launch-Track Office, through container service. Depending on the resulting quantities, the containers that can be requested have capacities of 1.7 m.c., 7 m.c. or 22 m.c.. The company proceeds to neutralize, sort and recover these types of waste, by categories, reusing them for various other activities. In quantities of less than 1 cubic meter, waste producers benefit from the free voluntary deposit once a month / person at the permanent collection points, based on identity documents. It is forbidden to deposit these types of waste in garbage cans or containers intended for municipal waste collection, as well as uncontrolled dumping in the public domain.

Spring-autumn cleaning campaigns

Every year, RETIM Ecologic Service, together with the Timișoara City Hall, organizes the biannual cleaning campaigns, "General spring cleaning" and "General autumn cleaning".

The action collects only household and household waste and vegetable waste resulting from the cleaning of trees planted on street alignments and green spaces around buildings, citizens are urged to deposit in order at the curb, without impeding traffic, waste and objects which is collected under this action, no later than one day before the day on which the collection is scheduled in the areas and neighborhoods in which they live.

The general spring cleaning usually takes place in March or April during 2-3 weeks, the RETIM trucks taking from the citizens the waste they take out of the household according to a well-established program, the city being divided into perimeters, each street being scheduled for a day for collection. Thus, in the first week, the cleaning takes place north of the Bega Canal, and in the second week south of it.

The general autumn cleaning usually takes place in September or October under the same aspects as the spring cleaning.

Communication sanitation activity (sweeping, street washing)

The street sanitation in Timișoara includes manual and mechanical sanitation services. The main activities in street sanitation are: manually sweeping roads, manually maintaining sidewalks, mechanically sweeping roads, mechanically washing roads, mechanically spraying streets, collecting, transporting and storing street waste.

Mechanized sanitation is performed with high-capacity self-propelled, as well as with trucks designed to clean markets and narrower spaces. Mechanical sweeping is carried out throughout the year, until the snow falls.

Manual sanitation and street maintenance are carried out daily, also on well-established routes, and also includes emptying of street bins. Manual sweeping is carried out

from 1 April to 1 October. Street sanitation includes, in addition to sweeping, mechanical and manual washing, and street spraying.

Mechanical washing is carried out between April 1 and May 30, respectively when the daytime outdoor temperatures constantly exceed 5 °C. Manual washing, as well as street spraying is carried out between May 1 and October 1. These operations aim, at the same time, to reduce dust suspensions (PM10) in the air, as well as, especially in the very hot period, to improve the thermal comfort of citizens.

RESULTS AND DISCUSSIONS

Quantities of waste collected and transported in the period 2011-2015

During 2011, during the dual collection, 10,314.69 tons of waste were collected, of which 1449.26 tons of cardboard and paper, 689.88 tons of PET and foil were sorted and recycled at the "Municipal Waste Sorting Station". The rest of the waste was recovered for energy.

The collection, transport and storage of bulky and non-hazardous waste within the municipality of Timișoara continued in 2011, by making available to citizens containers with a capacity of 7 and 22 m.c. From containers with a capacity of 7 m.c. bulky waste was collected, transported and stored in the amount of 14,094.20 tons, and from containers of 22 m.c. a quantity of 2,485.30 tons.

The "Spring Cleaning" campaigns were also organized between April 4 and 22, 2011 and a quantity of 4,404.14 tons of waste and "Autumn Cleaning" were collected, which took place between October 10 and 28, 2011, on which occasion -collected 1,812.08 tons of waste.

At the collection points of construction waste in quantities of less than 1 m.c. during the year an amount of approximately 7,565 m.c. construction waste.

During 2011, 29.26 tons of WEEE were collected.

During 2012, during the dual collection, 10,181.93 tons of waste were collected, of which, following the sorting at the Municipal Waste Sorting Station, the following types and quantities of materials were delivered for recycling: paper-cardboard - 1,505.68 tons; PET - 594.88 tons; foil - 22.42 tons; aluminum cans 16.86 tons; canned food - 1.15 tons; glass - 112.90 tons; crates - 3.14 tons. Recycled materials account for about 23% of the total.

The collection, transport and storage of bulky and non-hazardous waste within the municipality of Timișoara continued in 2012, by making available to citizens containers with a capacity of 7 and 22 m.c. Also, starting with 2012, RETIM responded to the requests of the citizens who generate smaller quantities of inert waste and with containers with a volume of 2 m.c. Within this service, a quantity of 14,102.40 tons were collected, transported and stored.

As every year, the "Spring Cleaning" campaigns were organized between March 19 and April 3, 2012 and a quantity of 4,808.16 tons of waste was collected and "Autumn Cleaning" which took place between October 15 and 31, 2012, on which occasion 3,296.58 tons of waste were collected.

At the collection points of construction waste in quantities of less than 1 m.c. during the year an amount of approximately 4,323 m.c. construction waste.

During 2012, 28.48 tons of WEEE were collected.

For the collection of glass packaging, 28 pieces of bell type containers were placed on the hearth of Timișoara. A quantity of 91.76 tons was collected and recycled.

In 2013, approximately 80,678 tons of household waste were collected from the municipality of Timișoara.

In 2013, approximately 10,500 tons of recyclable waste were collected. Following the sorting at the Municipal Waste Sorting Station, the following types and quantities of materials

were delivered for recycling: paper-cardboard - 1,719,780 kg; PET - 579,340 kg; foil - 109,040 kg; aluminum cans - 15,080 kg; metal - 26,000 kg; plastic material - 36,480 kg.

Of the 30 bell-type containers intended for the collection of glass packaging, a quantity of approximately 55 tons was collected and delivered for recycling. In September 2013, the education and awareness campaign "LogicEcologic" was launched, on which occasion approximately 40,000 guides for the selective collection of waste were distributed to the population.

Through the Service of collection, transport and storage of bulky and non-hazardous and construction waste, a quantity of 15,193 tons was collected, transported and stored.

During 2013, 3,598 m.c. wastes from construction and interior design.

Within the campaign "Spring Cleaning 2013" carried out between April 8-24, 2013, 3151.91 tons of waste were collected, and within the campaign "Autumn Cleaning 2013" carried out between October 14-31, 2013, were collected 3,541.16 tons of waste.

From June 2013 through the Concession Contract no. 7243 / 13.06.2013 S.C. RETIM Ecologic Service S.A. took over the concession of the operation service of the Non-Hazardous Waste Landfill from Ghizela commune, Timiș county, within the project "Integrated waste management system in Timiș county". By the end of 2013, a quantity of 79,987 tons of waste was taken over for final storage.

In 2014, approximately 78,030 tons of household waste were collected from the municipality of Timișoara.

In 2014, approximately 10,442 tons of recyclable waste were collected. Following the sorting at the Municipal Waste Sorting Station, the following types and quantities of materials were delivered for recycling: paper-cardboard - 1,904,880 kg; PET - 470,060 kg; foil - 58,200 kg; aluminum cans - 9,810 kg; metal - 29,000 kg; plastic material - 17,700 kg; glass - 167,520 kg; D.E.E.E. - 18,800 kg; tires - 56,590 kg.

Through the Service of collection, transport and storage of bulky and non-hazardous waste and from construction, a quantity of 10,843 tons was collected, transported and stored.

During 2014, 2,820 m.c. wastes from construction and interior design.

Within the campaign "Spring Cleaning 2014" carried out between March 24 and April 9, 2014, 3501.37 tons of waste were collected, and within the campaign "Autumn Cleaning 2014" carried out between October 13-30, 2014, collected 3,259.52 tons of waste.

In 2014, a quantity of 182,240 tons of waste was taken over for final storage.

In 2015, approximately 84,300 tons of household waste were collected from the municipality of Timișoara.

In 2015, approximately 11,627 tons of recyclable waste were collected. Following the sorting at the Municipal Waste Sorting Station, the following types and quantities of materials were delivered for recycling: paper-cardboard - 2,105,180 kg; PET - 363,442 kg; foil - 92,040 kg; aluminum cans - 15,968 kg; metal - 13,240 kg; plastic material - 27,470 kg; glass - 349,580 kg; D.E.E.E. - 40,280 kg; tires - 55,500 kg.

Through the Service of collection, transport and storage of bulky and non-hazardous and construction waste, a quantity of 12,293 tons was collected, transported and stored.

During 2015, 3,383 m.c. wastes from construction and interior design.

Within the "Spring Cleaning 2015" campaign carried out between March 16 and 31, 2015, 3,649.58 tons of waste were collected, and within the "Autumn Cleaning 2015" campaign carried out between October 19 and November 4, 2015, collected 2,995.21 tons of waste.

Also during 2015, street waste in the amount of 12,043 tons was collected, transported and stored.

In 2015, a quantity of 203,198 tons of waste was taken over for final storage.

Table 1

Quantities of waste by categories (in tons) from 2013-2015

Waste categories	2013	2014	2015
Household waste	80678	78030	84300
Recyclable waste	10500	10442	11627
Bulky and non-hazardous construction waste	15193	10843	12293
Spring cleaning	3151,9	3501,4	3649,6
Autumn cleaning	3541,2	3259,5	2995,2
Waste taken over for final disposal	79987	182240	203198

Table 2

Areas covered by each street sanitation activity in 2015

Activity name	Area (thousands of m.p.)
Road sweep manually	69.399
Manually maintained sidewalks	217.112
Mechanically swept road	288.666
Mechanically washed road	9.457
Mechanically sprayed streets	39.729
Handwashed road	0

CONCLUSIONS

- S.C. RETIM Ecologic Service S.A. through all the investments and actions undertaken, it permanently tries to meet all the requirements regarding the waste management in the municipality of Timișoara and not only;
- the high degree of coverage of the population, institutions and economic agents with sanitation services at European standards;
- by implementing at the level of Timișoara a dual collection of household waste (dry and wet fraction) the quantities collected of recyclable waste have increased significantly;
- the organization and development of awareness campaigns and ecological education of the population, contributed greatly to the observance of the selective collection of household and assimilable waste;
- street sanitation in the city of Timișoara, contributes to increasing the quality of life and last but not least to the protection of the environment.

BIBLIOGRAPHY

- ANTONESCU N.N., STĂNESCU D.-P., ANTONESCU N., POPESCU L.L., 2006 - Gestiunea și tratarea deșeurilor urbane - *Gestiunea regională*, Ed. Matrix Rom București;
- APOSTOL T., MĂRCULESCU C., 2006 - Managementul deșeurilor solide, Ed. Agir București;
- BOLD O. V., MĂRĂCINEANU G. A., 2004 - Depozitarea, tratarea și reciclarea deșeurilor și materialelor, Ed. Matrix Rom București;
- BUZATU G. D., GAVRILESCU E., 2014 - Gestiunea deșeurilor, Ed. Sitech, Craiova;
- CĂPĂȚÎNĂ C., RACOCEANU C., 2003 - Deșeuri, Ed. Matrix Rom București;
- CĂPĂȚÎNĂ C., SIMONESCU C. M., 2006 - Depozitarea, tratarea și reciclarea deșeurilor și materialelor recuperabile, Ed. Matrix Rom București;
- HĂTEGAN I., HOTICO L., 2011 – Monografia serviciilor de salubritate din Timișoara RETIM Ecologic Service S.A. – continuatoare a unei vechi tradiții 1911-2011, Editura Artpress, Timișoara;
- MODOI C. O., OZUNU A., 2012 – Aplicații practice în domeniul managementului deșeurilor solide, Ed. EFES, Cluj-Napoca;
- NEGREA A., COCHECI L., PODE R., 2007 - Managementul integrat al deșeurilor solide orășenești, Editura Politehnica Timișoara;
- ORLESCU M., POPESCU F., 2002 - Reciclarea și depozitarea ecologică a deșeurilor - exemple de calcul, Ed. Politehnica Timișoara;
- PASCU R., 2009 - Managementul deșeurilor, Ed. Universității “Lucian Blaga” din Sibiu;
- PĂUNESCU I., ATUDOREI A., 2002 - Gestiunea deșeurilor urbane, Editura Matrix Rom, București;
- PĂUNESCU I., PARASCHIV G., 2006 - Instalații pentru reciclarea deșeurilor, Ed. Agir București;
- UNGUREANU C., OPRÎȘA-STĂNESCU P. D., IONEL I., GRUESCU V., 2006 - Gestionarea integrată a deșeurilor municipale, Editura Politehnica Timișoara;
- VOICU G., 2007 - Utilaje pentru gospodărie comunală și ecologizarea localităților, Ed. Matrix Rom București;
- WEHRY A., ORLESCU M., 2000 - Reciclarea și depozitarea ecologică a deșeurilor, Ed. Orizonturi Universitare;
- *** - <https://www.retim.ro>
- *** - www.primariatm.ro
- *** - www.adidtimis.ro
- *** - <http://www.cjtimis.ro/>
- *** - Hotărârea Nr. 856 din 16 august 2002 privind evidența gestiunii deșeurilor și pentru aprobarea listei cuprinzând deșeurile, inclusiv deșeurile periculoase.