



Solid Waste

Municipal Solid Waste (MSW)

Generally speaking, waste is a wide term referring to consumed materials or resulting from an activity or a process, and which, owing to its physical and/or chemical and biological properties becomes useless and therefore neglected and intended to be discarded or disposed of. Current legislations in this respect, as well as management practices and most of CDR's projects and contracts concern municipal solid waste (MSW). Laws and enforced decisions have stipulated that other types of waste should be treated by the private bodies producing them, under the guidance and full supervision of the concerned ministries, according to the "polluter pays" principle.

Current situation: the concerned authorities are working towards the promotion of a comprehensive waste management plan in Lebanon that is compatible with the socio-political situation and translates into actions the desired expectations, in order for it to become integrated into the sustainable development principles in the national programs and policies, thus reducing environmental degradation.

The Council of Ministers' decision No.1 dated 30/3/2010, commissioned a committee headed by the Prime Minister and composed of: the Minister of the Displaced, The Minister of State for Administrative reform, the Minister of Interior and Municipalities, the Minister of the Environment, the Minister of Energy and Water, and the President of CDR, to develop a plan proposal concerning waste management in all Lebanese regions, provided that it covers all the aspects of the issue, particularly:

- The techniques and methods to be adopted for the implementation of this plan
- The suggested locations for it
- How to provide the necessary funding
- The authority to be in charge of this plan

The committee shall also make recommendations concerning the measures and procedures to be taken with regard to the temporary landfill in Naameh.

And on 1/9/2010, the Council of Ministers issued decision No. 55, approving the ministerial committee's proposals which included:

- 1- Adopting thermal decomposition and the conversion of waste into energy in the major cities
- 2- Adopting the 2006 Plan in the rest of the Lebanese regions and studying the possibility of adoption of thermal decomposition in them.
- 3- Involving the private sector and facilitating its solid waste management tasks, its participation being through the Turn Key (from collection to final treatment) or by 2 Different Options:
 - 1- Collection,
 - 2- Treatment
- 4- To commission the Ministry of the Environment and CDR to combine the two plans, each proposed by one of them, consistently with what was agreed upon above.
- 5- To commission the Ministry of Energy and Water to propose a legislation that secures the right of the private sector to produce and sell the energy produced from the decomposition of waste.

6- To motivate the municipalities whose lands will be used for the establishment of the various waste management facilities: thermal decomposition plants, processing stations, composting stations and landfills

7- To commission CDR, in coordination with the Ministry of the Environment to sign a contract with an international consultant for the purpose of:

- Choosing the best solution and the most appropriate mechanism for the Lebanese reality (based on the spirit of the plan).

- Setting the technical specifications for the preliminary classification of the thermal decomposition companies

(Due diligence to short list only proven technologies)

- Assessment and classification of companies

- Establishing tender specifications for the final bid

- Bid appraisal

- Monitoring the implementation

8- To commission the Ministry of the Environment to sign a contract with an international consultant to control workflow quality according to the spirit of the plan and good work progress in it

9- To commission the Ministry of the Environment to contract with a local consultant in order to conduct an awareness and guidance campaign to introduce the thermal decomposition technique and make it acceptable (admission).

10- The Presidency of the Council of Ministers shall be entrusted with the power of monitoring execution workflow and securing funding for

it, while benefitting from successful experiences in neighboring countries.

Main Problems:

- The problem of household waste in Lebanon lies mainly in landfill locations, whether they are ordinary dumps or landfill sites for disposal after the sorting and recycling processes; it also concerns waste management before reaching the dump. Therefore, the recycling and the composting processes should be promoted.

- The financial perspective is considered the most important and accurate element when it comes to the implementation of any proposed waste management plan, especially in developing countries like Lebanon, for there are no adequate laws regulating this matter.

- The legislations on the management of household solid waste in Lebanon are superficial, contradictory and unclear, especially with respect to the distribution of responsibilities and tasks between the concerned departments and ministries. Currently, a draft law concerning integrated waste management is being prepared.

- The Union of Municipalities, administratively and technically supported by the Ministry of the Environment and Ministry of Interior and Municipalities, should unite their efforts for the selection of locations for dumps and sorting and composting facilities. This aim is to be achieved in the framework of an informational and consultative effort with the civil society which can hinder the

implementation of projects if it is not respected and its views are not taken into account.

Main achievements of the (1992-2011) period

The Lebanese governments have not adopted a centralized policy or a unified management for the treatment of solid waste in Lebanon, since this issue fell within the powers and interests of municipalities that were the administration overseeing the proper execution of these services. However, the civil war had a bad impact on the municipalities' financial, administrative and technical means, which reflected negatively on the continuity of these services. With the beginning of 1992, the government assigned the management of this sector in the capital and the suburbs to CDR, due to the impotence of the municipalities in dealing with this problem. Ever since, the CDR has worked, in coordination with the concerned ministries, towards the establishment of an integrated policy that provides the best solutions for Lebanon.

Urgent plan for the treatment of solid waste in Greater Beirut:

Following the closure of the Bourj Hammoud dumpsite in January 1997, the government decided to implement an urgent plan for the treatment of solid waste in Greater Beirut. A contract was signed with SUKOMI to expand and raise the capacity of the Amrousieh and Qarantina solid waste treatment plants, upgrade the sorting process, separate recyclable material and extract compost material. This plan

also included the construction of sanitary landfills for Greater Beirut and its suburbs. Two sanitary landfills were established in Na'meh and Bsalim. Both are currently in operation.

Rehabilitation of Tripoli dumpsite: The uncontrolled dumpsite located on Tripoli seacoast has been rehabilitated. A sea wall was constructed around it to reduce environmental risks. Moreover, the necessary equipment for operating the dumpsite in an environmentally safe way was procured in order to upgrade solid waste management in Tripoli region. The dumpsite has been in operation since 1998.

Construction of Zahleh sanitary landfill: The new sanitary landfill serving Zahleh caza is complete and the required vehicles and equipment for its operation have been procured. The works and procurements were financed by the World Bank. This dumpsite has been in operation since 2001.

Implementation of a sanitary landfill and a solid waste treatment plant project in the framework of the comprehensive waste management plan in Baalbeck caza.

Procurement of waste collection equipment for various regions: Within the framework of the urgent program, the World Bank funded the procurement of waste collection equipment, including vehicles, street sweeping equipment and special containers. These were distributed on all Lebanese regions. In the second phase of this project and within the framework of the Household Solid Waste

Management Plan (SWEMP), the World Bank funded the procurement of waste collection and street sweeping equipment for the regions where construction works of sanitary landfills or rehabilitation of uncontrolled dumpsites were completed, such as Beirut, Zahleh and Tripoli.

Hospital waste treatment: In 1998, the CDR awarded the hospital waste treatment study, funded by the World Bank, to ERM. Several phases of the study are complete. This has allowed concerned parties to take decisions regarding the most appropriate means for hospital waste treatment. The Ministries of Environment and Public Health together with CDR have decided to build a central incinerator which complies with international standards and operates at a temperature of 1200oC minimum, as a possible means of hospital waste treatment. The environmental impact assessment and the design study have not been prepared because the appropriate construction site is not known yet.

Marketing of compost and recyclable material: The feasibility study for marketing organic compost and recyclable materials generated by the Quarantina, Amroussieh and other treatment plants was completed by ARCADIS/EUROCONSULT in December 2003. The study was financed by the World Bank within the framework of SWEMP.

Financial audit of amounts due to SUKLEEN and SUKOMI: According to the Council of Minister's Decision No. 16 dated

14/8/2003 concerning the launching of an international tender for constructing and operating the solid waste treatment plants and landfills for a period of ten years, and in order to ensure the success of this tender, CDR was assigned to audit the amounts due to SUKLEEN and SUKOMI. Accordingly, the audit contract was awarded on 18/9/2003 to PRICEWATERHOUSECOOPERS, which is an international audit firm.

Technical Assistance for identification of treatment plant and landfill locations and preparation of environmental impact assessment: To implement the Council of Minister's directives concerning the identification of treatment plant and landfill locations, CDR awarded the impact assessment to Consultant Rafic Khoury who started his work during the third quarter of 2003. The Consultant prepared the environmental impact assessment of the locations identified by the technical committee commissioned with this task.

The comprehensive Household Solid Waste Management Plan: CDR established a comprehensive plan which was approved by the Council of Ministers in 2006. It is based on the following principles:

1- Recycling and composting to the greatest extent in order to reduce the quantity of dumped waste; and distribution of recycling, sorting and composting plants on all cazas, with one or more sanitary landfills in each service area.

2- For this purpose, Lebanon shall be divided into four service areas:

- The North and Akkar governorates
- The Beka'a and Baalbeck-Hermel governorates
- The South and Nabatieh governorates
- Mount Lebanon and Beirut governorates

3- To provide incentives to municipalities whose lands will be used for sorting stations, composting plants, sanitary landfills or incinerator centers. These municipalities will be paid a certain amount per every ton of solid waste, as proposed in the plan and according to laws and decrees that will be issued in this respect.

4- Sweeping, collection and transport of waste to sorting stations and composting plants shall be handled by the municipalities at their own expense.

5- The contractor shall be responsible for financing the relevant study, executing and preparing the sanitary landfills, incinerator centers, sorting stations and composting plants. The contractor shall also be charged with the management of these facilities for ten years on the basis of a certain fee per each ton of transported and treated waste.

Maritime and back-filling works in Saida waste mountain area: the Council of Ministers issued Decision No. 37, dated 26/5/2009,

directing CDR to prepare the necessary studies and draft decrees required, and to implement the maritime and back-filling works in Saida waste mountain area, to be funded through the US\$ 20 million grant donated by the Kingdom of Saudi Arabia, the rest of the cost being financed by the Lebanese government.

Progress, during 2011, in contracts awarded before 2011:

The Council of Ministers issued Decision No. 45, dated 30/12/2008, concerning the continued payment of dues belonging to the companies handling, by virtue of decisions by the Council of Ministers, all types of waste-related works, in some regions and municipalities, from the Autonomous Municipal Fund according to the rules and procedures followed in making payments due to each company, until the approval and implementation of the solid waste management plan and its funding mode.

By virtue of Decision No. 34, dated 6/4/2010, the expansion of Naameh landfill was linked to the decision concerning the solid waste management plan subject of the Council of Ministers Decision No.1 dated 30/3/2010, and emphasis was placed on the implementation of Decree No. 9093 dated 15/10/2002 (amendment to Article 11 of Decree 1917



Rehabilitation of a landfill - Zahle



Recycling - sorting and composting domestic waste

dated 6/4/1979), stipulating that each municipality establishing a sanitary landfill or a plant for treating its waste on its territory shall benefit from increased proceeds from the Autonomous Municipal Fund equivalent to five times their share, and that each municipality establishing a sanitary landfill or a waste management plant on its territory for at least 10 municipalities, shall benefit from increased proceeds from the Autonomous Municipal Fund equal to ten times their share.

It has also been decided to extend the current household waste sweeping, collection, treatment and landfill contracts in Greater Beirut and some neighboring areas, signed with Averda Group. It also included the extension of Lacico's advisory contract until the start of the implementation of the solid waste management plan, provided that the extension period doesn't exceed 4 years, ending at latest on 17/1/2015, and provided that the contractor and the consultant are notified of the extension end date at least six months before.

Pursuant to the General Secretariat of the Council of Ministers' letter No. 2067/-- dated 13/9/2010, CDR prepared a comparison table between the prices adopted in the Verda Group contracts and those adopted in similar contracts in Lebanon and some European or American cities or countries. It also discussed the possibility of canceling the sorting and composting processes from the contracts and the saving that can be achieved by doing it. Furthermore, it provided an explanation for the components and items included in the price of one ton of solid waste

as adopted in such contracts.

Operation contracts: CDR signed a contract with SUKLEEN for the collection of household solid waste and street sweeping in Greater Beirut and some areas of Mount Lebanon. Commissioned to implement the urgent plan for Greater Beirut, it also signed two contracts with SUKOMI for operation of the Amrousieh and Quarantina solid waste treatment plants and the Coral composting plant, as well as the construction and operation of Naameh and Bsalim sanitary landfills. Currently, CDR is commissioned to launch a new international tender for solid waste treatment and landfills, provided that contracts with SUKOMI are terminated within the periods specified in the agreements, and that such termination does not occur before the new contractor(s) takes over.

The works are currently progressing within the framework of the urgent plan for Greater Beirut. After fully utilizing cells (1) and (2) of the Naameh sanitary landfill site, which cover an area of 120,000 m² with a combined capacity of two million tons of waste, an additional area of 62,000 m² was prepared for a new cell (3). The latter is currently being used as a sanitary landfill for the solid waste produced by Greater Beirut and some areas in Mount Lebanon. Due to the necessity of continuing to use this sanitary landfill until the alternative location designated in the SWEMP project is ready, the Council of Ministers approved, under Decision No.1 of 28/6/2006, the expropriation of an additional area of about 25,000 m² for

expanding this landfill. Even though the expropriation was then implemented in order to ensure the landfill's continued use for three additional years, to allow the invitation to a new tender in implementation of the waste management plan, and select new contractors to implement it, and adopt new treatment centers and landfills in the sites identified in it. Moreover, sweeping, collection, landfill and treatment contracts were extended for 3 years, ending on 10/11/2010, under the same conditions, in order to ensure continuity of work in solid waste facilities, by virtue of Decision No. 88 dated 10/11/2007. It is to be noted that the remaining period of the life span of the Naameh sanitary landfill allows it to keep receiving waste until 2010, according to the Lacico consultants.

Operation of Tripoli dumpsite: After launching an international invitation to tender in 1999, CDR signed a contract with BATCO for the operation of Tripoli dumpsite. This contract, which is renewable annually, is financed by the Al-Fayha Union of Municipalities. The contract aims to treat solid waste by using appropriate sanitary dumping methods, extraction of generated gas and incineration. In this connection, the Council of Ministers issued Decision No. 28, dated 17/7/2003, directing CDR to prepare a study for expanding Tripoli dumpsite and extending the period of its use. After submitting to the Council of Ministers the study prepared by Dar al Handassa (Nazih Taleb) related to the construction of a sorting and composting plant on plots No.

812,815 and 1123 adjacent to the dumpsite (total area of around 13000 m²) and expansion of dumpsite capacity by constructing a 9-10m high Gabion reinforced wall around its perimeter in order to be able to fill the spaces between this wall and the present dumpsite, the Council of Ministers approved, in its Decision No. 41 dated 18/2/2005, to include within the 2005 general budget and its annexes a draft law for projects amounting to US\$ 12 million, distributed over five years, to cover the cost of expanding and operating the sanitary dumpsite.

Operation of Zahleh landfill: In December 2001, CDR signed a contract with SERDIM/SCS to operate the new sanitary landfill in Zahleh and to transfer the contents of the old uncontrolled dumpsite to the new landfill. The two-year contract was financed by the World Bank within the framework of SWEMP. Upon expiry, the Council of Ministers approved, in its Decision No. 70 dated 12/2/2004, the extension of Zahleh landfill operation and supervision contract for three additional years ending on 31/12/2006, to be funded out of the general budget.

Zahleh landfill and treatment plant with associated equipment are the property of Zahleh municipality. Both were supplied recently with the necessary equipment, financed by USAID. The Council of Ministers Decision No. 62 dated 21/5/2007, concerning the delivery of the landfill and the transfer of its operation to Zahle-Maalaka municipality, was issued as an encouragement for this

municipality to take over its operation in the future and to initiate other municipalities to do the same.

Normandy dumpsite: The Normandy uncontrolled dumpsite on the seashore is located within the premises of Beirut Central District (BCD) reconstruction and development plan awarded by the government to Solidere. The project includes sorting and treating of existing waste and recovery of suitable materials to be used for back-filling a reclaimed area. The project cost amounts to US\$ 61 million, including supervision. A technical consultant has been appointed to supervise this project. It should be noted that 80% of the works have been completed while the remaining 20% are suspended at present awaiting the results of negotiations and arbitration between Solidere and the contractor. The current work plan will be directed toward studying and rehabilitating the reclaimed areas in preparation for the design and implementation of infrastructure works. The dumpsite treatment project is expected to be complete within three years, including the infrastructure studies and designs.

Preparing tender documents for solid waste collection, sweeping, treatment and landfills for a period of ten years in all Lebanese regions: CDR signed a contract on 3/10/2003 with Fichtner Consultants to provide consultancy services for this project. The Lebanese regions were divided into four service areas (Beirut and Mount Lebanon, the North and

Akkar, the South and Nabatiyeh, Beka'a and Baalbeck-Hermel). After completing the tender documents in November 2003, and issuing the Council of Ministers Decision No. 68, dated 20/5/2004, the basic tender documents were amended to cover new instructions that require contractors to include in their offers the methods and means to be adopted for disposal of solid waste. At that time, the Ministries of Environment and the Interior and Municipalities had some comments on the Tender Terms and Conditions. Subsequently, the Council of Ministers issued Decision No. 1, dated 28/6/2006, approving CDR's proposed plan (June 2006) for household solid waste management.

Maritime works project for the preservation of Saida waste mountain area: the main element of this project is the construction of a seawall stretching from the landfill site to the wastewater treatment plant, in order to protect the current landfill, in addition to back-filling the water area between the seawall and the shore. The back-filling works will result in the creation of a new reclaimed area that can be invested in various environmental activities, including the second phase of the wastewater treatment plant for the city and its environs. A part of it can also be invested in the Saida port to be built in the region. As a result of a tender, CDR awarded on 19/8/2010 the implementation of the project to Khoury Contracting Company, to carry out the maritime works intended to protect Saida waste mountain area.

Projects under preparation (2012-2014 period)

Out of emphasis on the planning and management process through the effective application to support the comprehensive plan, the Council of Ministers issued Decision No. 55 dated 1/9/2010, commissioning CDR and the Ministry of the Environment to:

- Combining the two plans, each proposed by one of them, consistently with the objectives set for the 2006 comprehensive plan.
- Adopting thermal decomposition and the conversion of waste into energy in the major cities
- Adopting the 2006 Plan in the rest of the Lebanese regions and studying the possibility of adoption of thermal decomposition in them.
- Involving the private sector and facilitating its solid waste management tasks, its participation being through the Turn Key (from collection to final treatment) or by 2 Different Options:
1- Collection,
2- Treatment

- To sign a contract with an international consultant for the purpose of:

- Choosing the best solution and the most appropriate mechanism for the Lebanese reality (based on the spirit of the plan).
 - Setting the technical specifications for the preliminary classification of the thermal decomposition companies (Due diligence to short list only proven technologies)
 - Assessment and classification of companies
 - Establishing tender specifications for the final bid
 - Bid appraisal
 - Monitoring the implementation
- Construction and operation of waste treatment plants and sanitary landfills in all regions: In response to the Council of Ministers decisions commissioning CDR to launch an international invitation to tender for the construction and operation of treatment plants and sanitary landfills in all Lebanese regions, CDR shall award these

contracts based on the final bid specifications.

Supervision of construction and operation of treatment and sanitary landfill sites: The contracts for the construction and operation of treatment plants and sanitary landfills in all Lebanese regions are expected to be awarded simultaneously with the related supervision contracts.

CDR shall continue to fulfill the duties entrusted to him by the Council of Ministers in terms of monitoring the implementation of ongoing contracts with companies handling all kinds of waste-related works; conducting periodical reviews of projects under implementation, and realizing performance evaluation assessments of adopted methods, as well as coordinating with concerned ministries and providing help in accordance with the provisions of the Solid Waste Law.

Proportion of organic solid waste in Greater Beirut and in Lebanon

