

Waste Management in the Coastal Regions of the Mediterranean

WASTE MANAGEMENT IN COASTAL AREAS OF THE REPUBLIC OF CROATIA

Waste Management Strategy and Waste Management Plan

According to the vision of waste management in Croatia contained in the Waste Management Strategy (Strategy) waste disposal on islands is banned. Furthermore, the construction of transfer stations with separate collection, recycling and baling of remaining waste, including transport to appropriate centres on the mainland is planned. Waste discharge into the sea, lakes, rivers and creeks is prohibited. Because of its' exceptional virtues, sensitivity and its' wide-outspread, attention must be paid to requirements that are specified for the construction of facilities and installations, i.e. the strictest criteria must be set for facilities that are to be installed in such regions. As far as the islands are concerned, there is a need to improve methods for the avoidance and reduction of waste, as well as for the temporary storage, pre-treatment and baling of waste; the baled and pre-treated waste should be disposed of on the mainland. In order to achieve the main tasks for improving the overall waste management system, there is a need to organize county-level waste management centres (WMCs) as well as the need to organize transfer stations on islands and on the mainland and equip such stations with baling and compression equipment. At transfer stations located on islands waste can be preliminary sorted and compacted in order to reduce the volume and facilitate transportation to a land-based WMC. Remediation of official landfills and the establishment of WMCs is in parallel conducted in the Republic of Croatia.

Remediation of official landfills

Remediation of official landfills in the Republic of Croatia is conducted according to the Strategy, the Waste Management Plan in the Republic of Croatia for the period from 2007 to 2015 and the Waste Act. A certain number of remediated landfills continue to function until an appropriate waste management centre is built while others cease to work. The table summarizes the landfill remediation data.

COUNTY	NUMBER OF OFFICIAL LANDFILLS	NUMBER OF REMEDIATED AND CLOSED OFFICIAL LANDFILLS	SANITARY DISPOSAL PROVIDED UNTIL A WASTE MANAGEMENT CENTRE IS BUILT	FINANCING PLANNED FROM COHESION FUNDS	IN THE PROCESS OF REMEDIATION
Dubrovačko neretvanska	19	8	2	1	8
Istarska	12	1	5	1	5
Ličko-senjska	13	1	1	3	8
Primorsko-goranska	15	3	3	4	5
Splitsko-dalmatinska	25	7	0	11	7
Šibensko-kninska	10	0	0	3	7
Zadarska	34	21	0	3	10

Construction of waste management centres

In accordance with the Waste Management Plan (OG 85/07 and 126/10), the implementation of the project of establishment of WMCs is in progress in the coastal part of the Republic of Croatia. The location of future WMC in Primorsko-goranska county is Marišćina, in Šibensko-kninska county – Bikarac, in Splitsko-dalmatinska county – Lečevica

(Kladnjice) and in Istarska county – Kaštijun. The transport of waste by a bigger capacity vehicle significantly decreases costs of transport to a larger distance for the local authority units. In some cases, especially in cities and bigger settlements or on islands, it is possible to place at the location of transfer station the special facilities equipped for pre-treatment of waste and temporary storage of special categories of waste collected in recycling yards. Also, at the location of transfer station it is possible to build the facility for treatment of construction waste before its' reuse or disposal of unusable part of waste. Such a facility has to have a valid permit. Transfer stations have the significant role in the integral waste management system because they make a link between the collection network of local authority units and WMCs. Wastes suitable for reception in the transfer stations is municipal waste from households and from industries that produce waste resembling to municipal waste, green waste, hazardous waste from households (e.g. abstergents, pesticides, herbicides, waste oils, antifreeze, paints etc.) and separately collected recyclable waste (construction waste, packaging waste etc.). The local authority units will implement programs with separated different waste streams, so it is necessary to make possible separate delivery, temporary storage and transport of separately collected waste in transfer stations. The estimated investment costs for the building of WMCs and establishment of the system are shown in the table below.

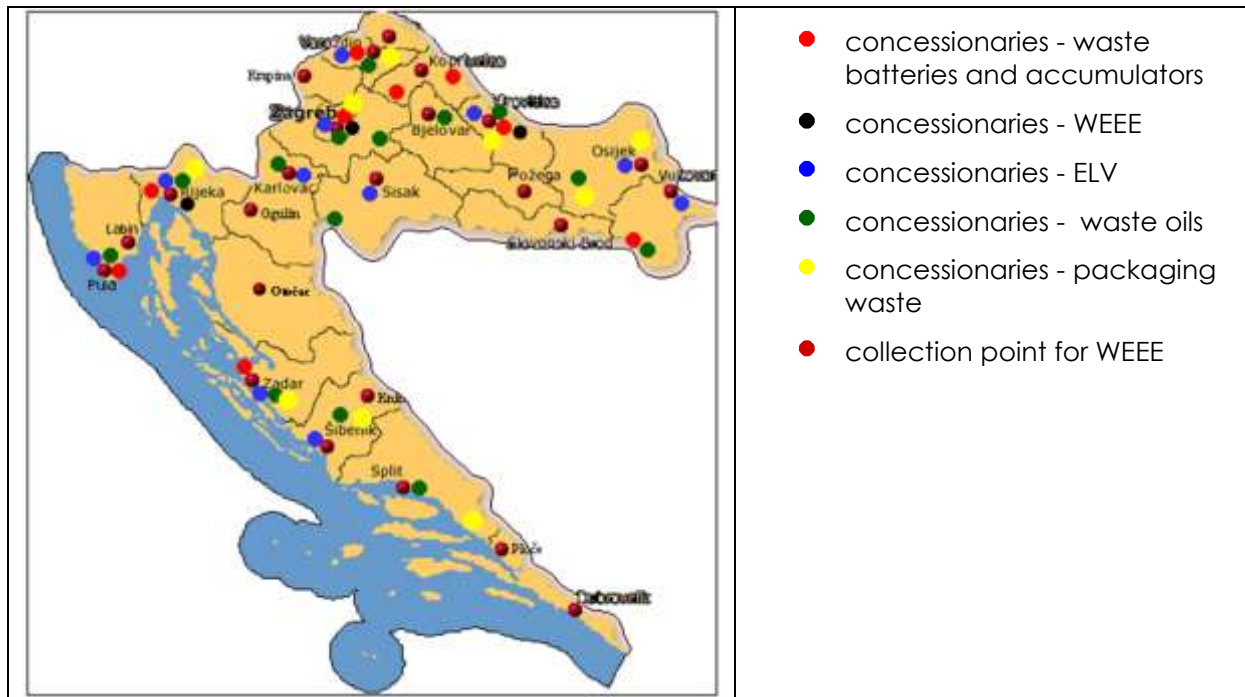
County	Investment in the MBT facility [EUR]	Landfills and infrastructure [EUR]	Transfer stations [EUR]	Investment costs for the building of WMCs and establishment of the system [EUR]	Estimated year of construction
Primorsko-goranska	19.000.000	27.100.000	5.000.000	51.100.000	2012.
Ličko-senjska	12.000.000	4.200.000	3.000.000	19.200.000	2017.
Zadarska	12.000.000	14.400.000	5.000.000	31.400.000	2014.
Šibensko-kninska	12.000.000	8.800.000	2.000.000	22.800.000	2011.
Splitsko-dalmatinska	28.000.000	36.700.000	8.000.000	72.700.000	2012.
Istarska	18.000.000	17.800.000	6.000.000	41.800.000	2012.
Dubrovačko-neretvanska	12.000.000	13.000.000	3.000.000	28.000.000	2015.

Compliance with EU *acquis communautaire*

All directives and regulations regarding waste management that are part of EU *acquis* are transposed into corresponding Croatian legislative acts. The only exemption is the new „Framework directive on waste“ (Directive 2008/98/EC) that will be transposed by the new Waste act by the end of year 2011.

The management of the special categories of waste

During the period of accession of Republic of Croatia to EU and transposition of EU legislation, the Ministry of Environmental Protection, Physical Planning and Construction adopted several ordinances on management of special categories of waste. Based on those ordinances, during the period 2006-2007 the network of concessionaires – collectors and recovery facilities of the special categories of waste was established. The main aim was to reduce the export of waste, especially the hazardous waste, and to retain the worth raw material for the needs of the Republic of Croatia. The map bellow shows the distribution of concessions for the management of special categories of waste in the Republic of Croatia.



The packaging waste management system is relatively complex. One of the foundations of this system is a „return fee“ which the Environmental Protection and Energy Efficiency Fund pays to the citizens through the merchant for the returned waste bottle. The main result of the mentioned implemented procedure is that most of the waste bottles in the Republic of Croatia enter the waste packaging recovery system.

Establishment of waste tires management system achieved that most of the waste tires are used in material recovery and the remaining part is used as fuel in a few Croatian cement kilns. There are 21 concessionaires for collection and 4 concessionaires for processing and recovery of waste tires in the Republic of Croatia. The basis of the system is giving over the waste tires when buying new ones.

Waste oils management system was set up in 2006. There are 28 concessions for collection and 13 concessions for recovery of waste oils in the Republic of Croatia. Besides energetic recovery, 3 concessionaires are recovering waste oils which include biofuel production.

Waste vehicles management system was set up in 2006. There are 16 concessionaires for collection and processing of waste vehicles. The owner of a waste vehicle should give in the waste vehicle to the approved companies in cities Pula, Rijeka, Ogulin, Otočac, Ploče, Split, Zadar, Šibenik and in the municipality Kistanje.

Medical waste, which is also often hazardous waste, in the Republic of Croatia is processed on several locations, mostly in healthcare facilities, and the most of this type of waste is exported for the disposal.

The waste electrical and electronic equipment (WEEE) system was set up in the second half of 2007, and there are concessionaires for collection and processing of WEEE. On the whole territory of the Republic of Croatia citizens may contact a collector by phone and ask for their WEEE to be collected. The system is financed by WEEE fees which are paid to Environmental Protection and Energy Efficiency Fund for EEE importing or putting on the Croatian market.

Management of construction waste is regulated by the Ordinance which entered into force in the first half of 2008. The basis of the system is “construction waste recycling yards” which should ensure the high percentage of recovery of this waste type, and at the same time a reduction of the quantity of land filled construction waste.

According to data from Statistical Annals of the Republic of Croatia, in the year 2003 there were approximately 256 mil. m³ wastewaters from public sewage. There were 171 mil. m³

untreated wastewater that ended up in watercourses and the sea, while approximately 84,3 mil. m³ were treated - approximately 74,7 mil. m³ mechanically, approximately 2,0 mil. m³ biologically and approximately 7,6 mil. m³ by combination of these two methods. Only about 33% of wastewaters has been treated in the Republic of Croatia, mostly mechanically (the first level of treatment), where there remains approximately 8.000 t of sludge. The sludge is partly used in agriculture, partly discharged in the sea and watercourses and partly landfilled. The construction of municipal wastewater treatment facilities will significantly improve the wastewater management, especially in the coastal area. But side-by-side with the construction of such facilities there is a raising problem of disposing the growing quantity of sewage sludge. Finding proper solutions for sludge disposal is in the focus of Croatian interest.

Waste management of asbestos waste is a challenge that the Republic Croatia has been dealing with for a couple of years. A system of collection, temporary storage and final disposal was put in place. Environmental Protection and Energy Efficiency Fund finances collection, temporary storage and final disposal originating from citizens. Disposal is managed in cassettes which are built in some landfills. The table lists locations and capacities of waste asbestos disposal cassettes.

COUNTY	TOWN OR MUNICIPALITY	LADNFILL	CASSETTE CAPACITY [m ³]
Primorsko-goranska	DELNICE	SOVIĆ LAZ	in process
Ličko-senjska	UDBINA	ČOJLUK	2 500
	GOSPIĆ	RAKITOVAC	5 000
Zadarska	ZADAR	DIKLO	7 000
Splitsko-dalmatinska	TROGIR	VUČJE BRDO - PLANO	3 000
	PUČIŠĆA	KOŠER	1 500
	VIS	WELLINGTON	1 500
Dubrovačko-neretvanska	PLOČE	LOVORNIK	3 400
	METKOVIĆ	DUBRAVICA	2 000

Activities in the framework of the Mediterranean Action Plan of the United Nations Environment Programme (UNEP / MAP)

The Republic of Croatia developed a National Action Plan (NAP) in 2005. in the framework of the Strategic Action Plan to reduce land-based pollution in the Mediterranean (SAP MED). The main task of the NAP is the proposal of environmental priorities in coastal areas of the Republic of Croatia and its execution represents the achievement of the basic objectives of the Strategic Action Plan (SAP). The most significant environmental problem in coastal areas of the Republic of Croatia is wastewater pollution. In accordance with the objectives of SAP (anticipating the solution of drainage and wastewater treatment for cities inhabited with more than 100 000 inhabitants by 2010) the priorities include solving problems of the cities of Split and Rijeka, and other major cities (Pula, Zadar, Šibenik and Dubrovnik). The NAP also includes priorities relating to the management and disposal of hazardous waste (spent chemicals, POPs, waste oils, batteries). Solving these problems is associated with full compliance with national and international legal guidelines.

Recognizing that the Mediterranean Sea in general and the Adriatic Sea in particular, represent an important route for transportation of oil and hazardous substances and that there is a constant danger of pollution, the Republic of Croatia actively participates in all of the UNEP/MAP activities and its Regional Marine Pollution Emergency Response Centre for the

Mediterranean Sea (REMPEC). The Republic of Croatia, as a contracting party to the Barcelona Convention, ratified the Protocol Concerning Cooperation in Preventing Pollution from Ships in 2003 and, in case of emergency, combating pollution of the Mediterranean Sea. This Protocol states the cooperation between countries in the region to prevent accidental marine pollution and common response in case of pollution as one of the basic assumptions.

One of the results of cooperation with Adriatic countries (Italian Republic and Slovenia) and REMPEC in the implementation of this Protocol is the development of Sub-Regional Contingency Plan for Prevention of, Preparedness for and Response to Major Marine Pollution Incidents in the Adriatic Sea. Agreement on the above Sub-Regional Contingency Plan was signed in 2005 and Croatia ratified it by the end of 2008.

At the proposal of the Ministry of Environmental Protection, Physical Planning and Construction, the Government adopted in 2008 the National Contingency Plan for accidental marine pollution which is aligned with the Sub-Regional Contingency Plan allowing a successful future cooperation with neighbouring countries in its implementation.

The National Contingency Plan for accidental marine pollution establishes procedures and measures for prediction, prevention, restriction, preparedness for and response to accidental pollution at sea and to the extraordinary natural events in the sea in order to protect the marine environment. The plan defines all the subjects in the implementation of the Plan and their commitment on national and regional level including the development of county contingency plans (all 7 coastal counties have developed county emergency plans) and assessing risk and vulnerability (in preparation).

One of the activities of UNEP / MAP MED POL Programme is also the implementation of the so-called "Dumping" protocol (the Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft from 1975 as amended in 1995 with a change in the name: The Protocol for the Prevention and Elimination of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft or Incineration at Sea). The Protocol succeeded to by Croatia in 1993, which ratified its amendments in 1998. The legal basis for the implementation of "Dumping" Protocol is given in the Environmental Protection Act, the Waste Management Act, the Maritime Code and the Maritime Domain and Seaports Act. However, the drafting of implementation regulations for the establishment of comprehensive systems and procedures is yet to come. The first step in this direction is planned in the process of drafting a new Waste Management Act, which will transpose the new EU Directive on Waste.

Transposition of the EU Framework Directive on Marine Strategy into national legislation is in progress and it will establish a closer legal framework for the development and implementation of the Strategy for the Protection of the Marine Environment so-called "Marine Strategy" in order to achieve and maintain good condition of the marine environment by 2020 applying the so-called "Ecosystem approach" to managing human activities based on sustainable use of goods and services of the marine environment. Implementation of the provisions of the Directive, inter alia, shall regulate also specific waste issues in the coastal area which includes the issue of "waste in the sea", so called "Marine litter".

Regarding the ship generated waste and their management, it is important to stress that the International Maritime Organization has two main instruments which regulate the prevention of pollution of sea by dumping of waste. These are the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (London Convention) and 1996 Protocol thereto and International Convention for the Prevention of Pollution From Ships, (MARPOL Convention).

Republic of Croatia is a Party to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter(Official Gazette- International treaties No. [3/95](#))

The "Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972", the "London Convention" is one of the first global conventions to protect the marine environment from human activities and has been in force since 1975. Its objective is to promote the effective control of all sources of marine pollution and to take all practicable steps to prevent pollution of the sea by dumping of wastes and other matter. Currently, [86 States](#) are Parties to this Convention.

The Republic of Croatia is not a Party to the 1996 Protocol.

Republic of Croatia is a Party to International Convention for the Prevention of Pollution From Ships, 1973 (MARPOL Convention) (Official Gazette, International treaties No. 1/92), as well as the 1978. Protocol (Official Gazette, International Treaties No. 1/92). The Convention includes regulations aimed at preventing and minimizing pollution from ships - both accidental pollution and that from routine operations - and currently includes six technical Annexes. special Areas with strict controls on operational discharges are included in most Annexes:

From 1991, Republic of Croatia is a Party to the Annexes I-V, and from 2005, it is Party to the Annex VI of the Convention as well.

Annex IV and Annex V and the MEPC Resolution 65(37) regulate the control of pollution of the sea by sewage and garbage from ships including instructions for garbage disposal on ship, Garbage Management Plan i Garbage Record Book.

When implementing the Annex V, Republic of Croatia has a role of flag state, coastal state and port state, which means that the implementation of this Annex is ensured concerning ship generated waste from Croatian flag ships wherever they are. Croatia carries out the supervision of the pollution and provides for waste reception as a coastal state and carries out the supervision over all the ships regardless of their flag, entering Croatian ports.

Ordinance on Terms and Methods of Maintaining Order in Ports and Other Parts of Internal Waters and Territorial Sea of Republic of Croatia, as a national legal act based on the Maritime Code, defines the way of reception of waste from ships in the ports, while the management of waste in ports will be regulated in the new Act on Maritime Domain and Sea Ports.