



Demonstration of a Regional Strategy for ODS Waste Management and Disposal in the ECA Region



BACKGROUND

The project “Demonstration of a Regional Strategy for ODS Waste Management and Disposal in the ECA Region” was prepared jointly by UN Environment and UNIDO, on behalf of the Governments of Bosnia and Herzegovina, Croatia, and Montenegro.

It was approved and accepted for funding by the Multilateral Fund in April 2013 under a funding window for the destruction of ozone-depleting substances (ODS) in low-volume-ODS-consuming (LVC) countries.

The objective of the project was to evaluate a regional approach for ODS waste disposal in terms of cost-effectiveness and sustainability, particularly in LVC countries that do not have ODS destruction



facilities. The project proposal aimed at environmentally sound destruction of 29.07 MT of ODS waste from the participating countries.

KEY ELEMENTS OF THE PROJECT

Component 1: Aggregation of ODS waste at the national level, included identification and selection of three recovery and recycling centers to collect and store national ODS waste, provision of necessary equipment, including the storage cylinders, technical assistance for the analysis of the composition of the ODS waste, and preparation of required permits in accordance with the requirements of the Basel Convention.

Component 2: Transportation of ODS waste, and destruction, included the assessment of eligible EU destruction facilities that allow import of waste ODS for destruction; bidding procedures for selection of destruction facilities; and transportation, destruction, verification, and monitoring of destroyed quantities.

Component 3: Establishment of a regional cooperation forum on ODS waste disposal, as a communication platform that promotes the information and experience exchange on success stories and lessons learned related to ODS destruction activities in the Europe and Central Asia region. Three meetings were organized during project implementation.

Component 4: Awareness raising, training, and project monitoring. Three national training workshops on aggregation of ODS stocks for destruction and improvement of the recovery and recycling systems were organized in Sarajevo, Podgorica and Zagreb.

RESULTS

In total, 41.37 metric tonnes (MT) of refrigerant waste were destroyed, including 32.79 MT of ODS waste.

Batch number	Country of destruction	Quantity of collected refrigerant waste (MT)	Quantity of ODS waste (MT)	Quantity of non-ODS waste (MT)
Batch 1	Germany	7.38	7.38	0
Batch 2	Poland	25.64	19.12	6.52
Batch 3	Poland	8.35	6.29	2.06
Total:		41.37	32.79	8.58

Taking into account the reported expenditures of USD 262,622 and the 32.79 MT of ODS waste destroyed, the cost effectiveness for the project is 8.01 USD/kg, which exceeds the initially expected cost effectiveness of 12.02 USD/kg.

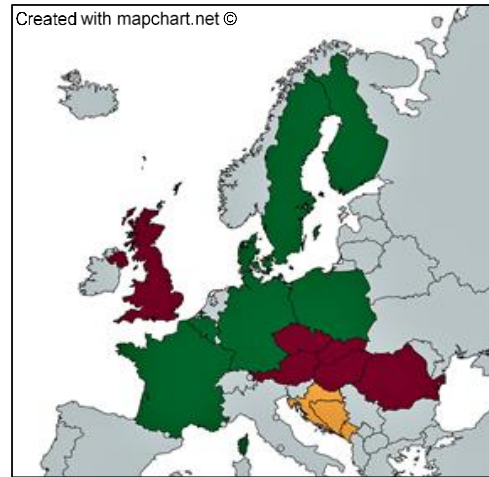
Aggregation of the ODS waste on the regional level, synchronization of the shipments from different countries, as well as finding synergies with the destruction of persistent organic pollutants were not possible, due to obstacles in both legislation and institutional arrangements of the beneficiary countries.

DESTRUCTION FACILITIES IN THE EU

There was no destruction capacity in the beneficiary countries, so facilities had to be identified abroad. European Union (EU) countries were considered due to their geographical proximity, type of destruction technologies, level of emission control and sustainability of the scheme in the future.

The criteria for selecting eligible destruction facilities were defined based on the list of destruction technologies approved by the Technical and Economic Assessment Panel¹ and the list of approved destruction technologies in the EU (Annex VII of EC/1005/2009²).

Twenty-eight licensed facilities in thirteen EU countries were identified that met the defined criteria. However, during the bidding procedure, it was realized that the legislation in some of the countries did not allow import of hazardous waste for destruction.



Map of **beneficiary countries (orange)**, EU countries **allowing (green)** and **not allowing (red)** the import of hazardous waste for destruction.

LESSONS

- The legislation in the EU and candidate countries does not allow the aggregation of ODS waste at the regional level, because ODS waste is classified as hazardous waste, and the import/export of hazardous waste is generally banned. Some EU countries have an exemption in place and allow the import of ODS waste for disposal in an environmentally sound manner. However, since none of the beneficiary countries had such destruction facilities, the exemption was not introduced in their legislation, and the import for aggregation and re-export was not allowed.
- Operational and well established recovery and recycling schemes are an essential prerequisite for the successful implementation of disposal activities. Recovery and recycling centres, that handle electrical and electronic equipment waste usually have relevant permits and are the main stakeholders. Also, it is important to recover refrigerants from end-of-life domestic appliances.
- Recovery and recycling centres need to be sufficiently equipped with storage cylinders to allow aggregation of waste refrigerants at the national level.
- Certification of servicing companies and technicians is important to ensure proper handling and collection of waste refrigerants.
- Waste refrigerants are usually mixtures of ODS (chlorofluorocarbons, hydrochlorofluorocarbons) and non-ODS (hydrofluorocarbons), and it is not economically feasible to separate ODS waste from non-ODS waste prior to destruction.
- Chemical analysis of waste refrigerant mixtures is important to determine the quantity of ODS waste contained in the mixtures, but also because the destruction costs of an unknown waste mixture is generally 25-30% higher.
- Destruction facilities should be selected based on geographical (proximity) and technical criteria.
- Targeted equipment inspections are critical for ensuring compliance with the RRR scheme and for maximizing collection of ODS waste. Environmental inspectors should be trained to inspect different types of RAC equipment, to review equipment log-books, and to be aware of commonly used refrigerants and related safety precautions.
- Environmental taxes on refrigerants contributing to ozone layer depletion and climate change can be used to subsidize the environmentally sound disposal of refrigerant waste in the long term.
- Croatian example shows that well established RRR system and operational Environmental Fund can ensure sustainability of the ODS waste destruction in the future.

Footnotes:

¹ Decision XXIII/12: Adoption of new destruction technologies for ozone-depleting substances

² Regulation (EC) No 1005/2009 of the European Parliament and of the Council of 16 September 2009 on Substances that Deplete the Ozone Layer

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