

# **Guidance** Document on **Transboundary** Movements of **Hazardous** Wastes destined **for Recovery** Operations



Basel Convention on the Control of  
Transboundary Movements on  
Hazardous Wastes and Their Disposal

No. 2



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**BASEL CONVENTION**  
ON THE CONTROL OF TRANSBOUNDARY MOVEMENTS OF  
HAZARDOUS WASTES AND THEIR DISPOSAL



SECRETARIAT

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Hazardous Wastes destined  
for Recovery Operations**

## Foreword

*These technical guidelines are principally meant to provide guidance to countries who are building their capacity to manage waste in an environmentally sound and efficient way and in their development of detailed procedures or waste management plan or strategy. They should not be used in isolation by the competent authorities for consenting to or rejecting a transboundary movement of hazardous waste, as they are not sufficiently comprehensive for environmentally sound management of hazardous waste and other waste as defined by the Basel Convention. These technical guidelines concern waste generated nationally and disposed of at the national level as well as waste imported as a result of a transboundary movement, or arising from the treatment of imported wastes.*

*It is necessary to consider this document in conjunction with the Document on Guidance in developing national and/or regional strategies for the environmentally sound management of hazardous wastes (SBC Publication - Basel Convention Highlights No. 96/001 - December 1995) adopted by the second meeting of the Conference of the Parties. In particular, special attention should be given to the national/domestic legal framework and the responsibilities of the competent authorities.*

*These guidelines are meant to assist countries in their efforts to ensure, as far as practicable, the environmentally sound management of the wastes subject to the Basel Convention within the national territory and are not intended to promote transboundary movements of such wastes.*

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## **I. INTRODUCTION**

1. Recovery<sup>1</sup> is a complex issue because of its environmental, trade and economic implications. It includes all the steps involved in recovering useable components of wastes so that they may be re-used, and the management of the unusable residues. This issue of transboundary movement of hazardous wastes destined for recovery operations could be reviewed in the context of the comprehensive management of such wastes and the environmental costs of using the analogous virgin materials. Waste management policies recognize the value of residues and wastes for their potential as economically useful materials or sources of energy and their potential for avoiding the environmental and economic costs from the extraction and processing of virgin materials. In future, cleaner and production methods, low waste technology and hazardous waste avoidance may help to reduce waste generation at source, but recycling and recovery operations would generally be preferred to landfilling and incineration.

2. Recovery operations have disadvantages. There is always a danger of sham recycling-wastes moved for final disposal in the guise of a recovery operation. Genuine recovery operations can be polluting. The availability of a cheap and easy recovery option can reduce the incentive to find and use other cleaner production options, contrary to the principle of the waste management hierarchy. The waste management hierarchy is explained in Chapter IV, and the advantages and disadvantages of the recovery of waste are discussed in more detail in Chapters VIII and IX.

3. One difficulty in reviewing the subject is the lack of sufficient quantified information or access to it about what hazardous wastes are exported to developing countries, what, if any, recovery technologies or processes have caused problems in developing countries and what environmental problems have occurred as a result. In contrast to this, a large body of information is available from authoritative sources in industrialized countries on the many aspects of recovery. This includes information about trends in world supply and demand, statistics on transboundary movements within industrialized countries, role of the secondary industrial sectors, priority waste streams more likely to be subject to recovery, the present extent of recovery, the present extent of recovery, current proven and developing technologies and environmental and health impacts of recovery, processes or operations.

## **II. THE BASEL CONVENTION AND RELEVANT DECISIONS OF THE CONFERENCE OF THE PARTIES**

4. The Basel Convention provides for a number of obligations with regard to transboundary movements which are applicable to hazardous wastes destined for recovery operations. These provisions are described in paragraphs 5 to 17. In addition, the Convention contains provisions with regard to the responsibilities of States which are relevant to the issue. In particular, each Party shall take the appropriate measures to:

- Article 4-2 (a): Ensure that the generation of hazardous wastes and other wastes<sup>2</sup> within it is reduced to a minimum, taking into account social, technological and economic aspects;

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<sup>1</sup> Recovery includes resource recovery, recycling, reclamation, direct re-use or alternative uses

<sup>2</sup> "Other wastes" is defined in Annex II of the Basel convention as representing wastes collected from households and residues arising from the incineration of household wastes

- Article 4-2 (b): Ensure the availability of adequate disposal facilities, for the environmentally sound management of hazardous wastes and other wastes, that shall be located, to the extent possible, within it, whatever the place of their disposal;
- Article 4-2 (c): Ensure that persons involved in the management of hazardous wastes or other wastes within it take such steps as are necessary to prevent pollution due to hazardous wastes and other wastes arising from such management and, if such pollution occurs, to minimize the consequences thereof for human health and the environment;
- Article 4-2 (d): Ensure that the transboundary movement of hazardous wastes and other wastes is reduced to the minimum consistent with the environmentally sound and efficient management of such wastes, and is conducted in a manner which will protect human health and the environment against the adverse effects which may result from such movement.

5. The Basel Convention provides for a very stringent control regime based on the prior informed written consent procedure. The Convention defines 47 categories of wastes in its Annexes I and II. The Convention lists 13 classes of hazardous characteristics which waste could exhibit (Annex III). A waste (defined or catalogued in the appropriate national legislation) subject to a proposed transboundary movement, is controlled under the Convention if it corresponds to a category listed in Annex I and exhibits one or more of the hazard characteristics of Annex III to the Convention, or is listed under Annex II. The Convention does not - in terms of the control procedure to be applied to waste which moves across frontiers - make a distinction between final disposal options and recovery ones (ref. Annex IV and B of the convention).

6. Article 4, paragraph 9 of the Convention stipulates that:

"Parties shall take the appropriate measures to ensure that the transboundary movement of hazardous wastes only be allowed if:

- a) The State of export does not have the technical capacity and the necessary facilities, capacity or suitable disposal sites in order to dispose of the wastes in question in an environmentally sound and efficient manner; or
- b) The wastes in question are required as a raw material for recycling or recovery industries in the State of import; or
- c) The transboundary movement in question is in accordance with other criteria to be decided by the Parties, provided those criteria do not differ from the objectives of this Convention".

7. In its Preamble, the Convention recognises the need to continue the development and implementation of environmentally sound low-waste technologies, recycling options, good housekeeping and management systems with a view to reducing to a minimum the generation of hazardous wastes. It recognises also the increasing desire for the prohibition of transboundary movements of hazardous wastes and their disposal in other States, especially developing countries.

## **Control procedure<sup>3</sup>**

8. Articles 6 and 7 of the Convention clearly define the control mechanisms applicable to transboundary movements between Parties and transboundary movements from a Party through States which are not Parties respectively.

9. Article 4, paragraph 5, stipulates that a Party shall not permit hazardous wastes or other wastes to be exported to or imported from a non-Party. This obligation should be seen in relation to Article 11 of the Convention which provides for the possibility for Parties to enter into bilateral, multilateral and regional agreements or arrangements with Parties and non-Parties provided that such agreements or arrangements do not derogate from the environmentally sound management of hazardous wastes and other wastes as required by the Basel Convention and that these agreements or arrangements shall stipulate provisions which are not less environmentally sound than those provided for by the Convention, in particular taking into account the interest of developing countries.

### ***A. Prohibition of export***

10. The Regulatory Authority shall not permit exports of hazardous wastes and other wastes in the following circumstances:

- To any point South of 60 degrees South latitude;
- To any State which has imposed a ban on the import of such wastes;
- If it has reason to believe that the wastes in question will not be managed in an environmentally sound manner, e.g. the State of import cannot provide assurance as to its capacity to recover such wastes in an environmentally sound manner and to dispose of its subsequent residue(s);
- To any State which is not Party to the Basel Convention except in the case of a State (non-Party) which has entered with a Party to the Convention into a bilateral, multilateral, or regional agreement or arrangement in conformity with Article 11 of the Basel Convention (refer to paragraph 9).

### ***B. Authorization of export***

11. Where the circumstances described in section A do not apply and in the absence of an agreement or arrangement under Article 11 of the Convention, the Regulatory Authority may permit the exportation of hazardous wastes and other wastes only after satisfying itself that the following conditions have been fulfilled:

- The exporter has provided the Regulatory Authority with the information requested by Annex VA of the Basel convention as well as details on labelling in relation to the hazardous wastes and other wastes he intends to export;
- Packaging, labelling and transportation are in conformity with the recognized international rules, standards and practices;

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<sup>3</sup> For the definitions of the terms used in this section, please refer to Article 2 of the Basel Convention



- The exporter has formally applied for the transboundary movement of such wastes;
- The written consent of the Competent Authority of the State of import and of other States concerned has been received by the State of export; however, in the case of a State of transit which has either no policy of granting written consent in such cases, or has waived the requirement of written consent, "tacit consent" shall be presumed after sixty (60) days of acknowledged receipt (by the transit State) of the request from the Competent Authority (for consent) - so long as no other conditions are imposed or objections raised by the transit-State in question during this sixty-day period;
- A movement document exists;
- An adequate contract exists between the exporter and the disposer specifying environmentally sound management of the waste in question.

**C. *Prohibition of import***

12.

- A ban or prohibition, total or partial, is declared by the State of import
- Lack of capacity/infrastructure/trained personnel in the State of import.
- Facilities or persons are not authorized to transport or dispose of the waste in question in the state of import.
- The wastes in question will not be managed in an environmentally sound way in the State of import or elsewhere.

**D. *Authorization of import***

13. The Competent Authority may consent in a written form to the importation of hazardous wastes and other waste provided the following conditions are met:

- The exporting State is a Party to the Basel Convention, unless Article 11 applies.
- The request which complies with the requirements of the Convention has been received for a transboundary movement containing the information listed in Annex V of the Basel Convention and the Competent Authority is satisfied with such information.
- The packaging and labelling conform with the requirements of international recognized rules, standards and practices.
- The specified approved recovery site or facility is capable of disposing of such waste in an environmentally sound manner.
- The State of import ensures that such wastes will be managed in an environmentally sound manner.

14. No movements of hazardous wastes or other wastes through the area under the national jurisdiction of a State of transit shall occur without prior written consent of the State in question subject to waiving of request by the State of transit.

### ***E. Verification***

15. It is important for the Competent Authority of the State of export, in cases where doubts may exist as to the capacity of the State of import to manage the recoverable wastes in an environmentally sound and efficient way, to assess the situation and obtain all the necessary assurances prior to consenting to the movement. According to Article 13 (paragraph 4) of the Basel Convention, Parties shall ensure that copies of each notification concerning any given transboundary movement, and the response to it, are sent to the Secretariat when a Party which considers that its environment may be affected by that movement has requested that this should be done.

16. Problem areas have to be identified by the Competent Authorities so as to avoid occurrence or repetition of dubious or fraudulent cases. Within the framework of the Basel Convention and pursuant to Article 16 (paragraph f) of the Convention, the Secretariat shall compile and circulate information among Parties concerning authorized national sites and facilities available for the disposal of their hazardous wastes and other wastes. In this regard, the Parties should provide specific information on the facilities authorized to accept hazardous wastes for recovery and specify what types of waste are to be accepted in such facilities and the kind of disposal operation(s) that will be used as indicated in Annex IV B to the Convention. This information, submitted on a regular basis to the Secretariat (i.e. once a year), has to be compatible with the information provided on both the notification form and movement document (refer to Annex V of the Convention).

17. Article 19 (on Verification) of the Convention requests any Party which has reason to believe that any other Party is acting or has acted in breach of its obligation under the Convention inform the Secretariat thereof. In such an event, the Party shall simultaneously and immediately inform, directly or through the Secretariat, the party against whom the allegations are made.

18. In addition, the Decision II/12 adopted by the Conference of the Parties at its second meeting and repeated in the Foreword of this document is relevant.

### **III. ANNOTATED REFERENCE<sup>4</sup> ON INTERNATIONAL AGREEMENTS OR ARRANGEMENTS CONCERNING OR RELATED TO THE TRANSBOUNDARY MOVEMENT OF HAZARDOUS WASTES DESTINED FOR RECOVERY OPERATIONS**

19. A number of international agreements or arrangements concern or are related to the transboundary movement of hazardous wastes destined for recovery operations, eleven of which are referred to below:

- the (Waigani) Treaty on Hazardous and Toxic Wastes (July 1995);

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<sup>4</sup> Annotated reference based on:

- a) SBC Publication 94/009 - Texts on the Bilateral, Multilateral and Regional Agreements or Arrangements Regarding Transboundary Movements of Hazardous Wastes and Other Wastes;
- b) Texts of international agreements registered in SBC Library.

- the Bamako Convention on the Ban of Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa (January 1991);
- the Protocol of the Southeast Pacific Countries on the Control of the Transboundary Movement of Noxious Wastes and their Disposal;
- the Central American Agreement on the Transboundary Movement of Hazardous Wastes;
- the Protocol for the Protection of the Mediterranean Sea against Pollution resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil;
- the OECD Council Decisions concerning the control of transfrontier movements of wastes; the Council of the European Communities Regulation (EEC) No 259/93 on the supervision and control of shipments of waste within, into and out of the European Community; and
- the Lome IV ACP-EEC Convention.

20. In addition, four Bilateral Agreements are referred to:

- the Agreement between the Government of Canada and the government of the United States of America concerning the Transboundary Movement of Hazardous Waste;
- the Agreement of Cooperation between the United States of America and the United Mexican States Regarding the Transboundary Shipments of Hazardous Wastes and Hazardous Substances; and
- the Agreement between the Government of the Kingdom of Sweden and the Government of the Kingdom of Morocco on the Control of the Transboundary Movements of Toxic Wastes and Other Wastes for Recovery Operations.

21. In April 1995 the South Pacific Forum members signed a treaty (Waigani) on the ban of importation into Forum Island States and the control of the transboundary movement and management of hazardous and toxic wastes within the South Pacific region, resolving to prohibit the importation into the South Pacific of hazardous and toxic wastes generated in other countries (Article 4) and to regulate and facilitate (Articles 4, 6 and 14) for the environmentally sound management of such wastes that are generated within the region by Member countries. The members in question are: Australia, New Zealand, Federated States of Micronesia, Cook Islands, Nuie, Tonga, Fiji, Western Samoa, Nauru and Papua New Guinea (Article 2). The entry into force will require 10 ratifications (Article 24). The Waigani Convention imposes stringent obligations designed to protect the environment of vulnerable Pacific Island countries and the health of their people. Inclusion of a radioactive ban and simplified reporting requirements reflect particular South Pacific concerns and realities.

22. The Bamako Convention created a framework of obligations to strictly regulate the transboundary movement of hazardous wastes to and within Africa. Under Article 4, paragraph 1, the Convention obligates Parties to take appropriate legal, administrative and other measures within the area under their jurisdiction to prohibit the import of all hazardous wastes, for any reason, into Africa from non-contracting Parties. Such import shall be deemed illegal and criminal act. The Bamako Convention in its Article 4, paragraph 3, (Waste Generation in Africa) stipulates that Parties shall promote clean production methods applicable to entire product lifecycles including, inter alia, reintroduction of the product into industrial systems or nature when it no longer services a useful function. The Bamako Convention does not distinguish, for control purposes, final disposal options from recovery ones. Articles 6 and 7 of the Bamako Convention provide detailed procedures for the control of transboundary movement between Parties and transboundary movement from a Party through States which are not Parties.

23. The Southeast Pacific countries presented a project of a protocol concerning all transboundary movements and/or the elimination of all hazardous wastes, including the radioactive wastes (Article 1). The States concerned are: Panama, Colombia, Ecuador, Peru and Chile (Article 2). The Parties shall take appropriate legal, administrative and other measures to prohibit the import of all types of hazardous wastes, including the radioactive ones, in all their territories, marine waterways and air space. Such import shall be deemed illegal and a criminal act (Article 6, paragraph 1). The protocol also prohibits the dumping of hazardous wastes and radioactive wastes in the seas. Such disposals shall be considered illegal and a criminal act (Article 6, paragraph 2).

24. On 11 December 1992 in Panama, the Central American Agreement was signed by the Governments of the Republics of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama with the object of controlling illegal traffic in hazardous wastes in the Central American Regions. The Agreement provides for the adoption of legal, administrative and other appropriate measures to prohibit the importation into and transit through Central America of hazardous wastes from countries not Parties to the Agreement. The Parties also undertake not to allow export of hazardous wastes if there is reason that the waste in question will not be managed in an environmentally sound manner. All illegal traffic shall be punished by penal sanctions.

25. On 14 October 1994, the Conference of Plenipotentiaries for the Protection of the Mediterranean Sea has concluded and adopted the Protocol for Protection of the Mediterranean Sea against Pollution resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil. The Protocol applies to the entire Mediterranean Sea Area (Article 2). The harmful or noxious substances and materials resulting from activities covered by the Protocol are divided in two classes, in order to decide if the disposal shall be prohibited or shall require a prior special permit from the competent authority (Article 9). The Parties shall ensure that sanctions are imposed in respect of illegal disposals (Article 13).

26. On 31 January 1991, the OECD Council enacted a Decision-Recommendation on the Reduction of Transfrontier Movements of Wastes – C(90) 178/FINAL. This Act is applicable to all wastes subject to controls under terms of the Basel Convention and all other wastes subject to transfrontier movements control of the exporting and importing Member countries. The Act establishes a distinction between wastes destined for recovery operations and wastes destined for final disposal. Regarding final disposal, the January 1991 Act provides that Member countries shall, insofar as possible, dispose in their own territory the wastes produced therein. Under Council Decision C(92)39/FINAL, dated 30 March 1992, the OECD Member countries adopted a three-tiered system to delineate controls to be applied to transfrontier movements of various classes of wastes destined for recovery operations: green tier, amber tier, and red tier.

27. On 20 October 1992, a political agreement was entered into between the twelve EEC Ministers of the environment, to control and supervise waste transfers within, into or out of the Community. The Regulation (EEC) No 259/93 on all waste transfers, which came into force on 6 May 1994, aims first to improve the system of control which is presently in force within the Community. Member States have decided to base the European Regulation on both the Basel Convention and the OECD Council Decision C(92)39/FINAL. Exports and imports of waste intended for final disposal are prohibited except towards EFTA (European Free Trade Agreement) countries which are Parties to the Basel Convention if both countries have given their consent. As for imports, the ACP countries (African, Caribbean and Pacific States covered by the Lome IV Convention) with no adequate facilities will also be entitled to export their waste into the European Community.

28. The European Community and its Member States, on one hand, and the ACP States (African, Caribbean and Pacific countries), on the other hand, signed the fourth ACP-EEC Convention in Lome on 15 December 1989, in order to promote and expedite the economic, cultural and social development of the ACP States (Article 1). The ACP countries shall ensure that international movements of hazardous waste and radioactive waste are controlled. The Community shall prohibit all direct and indirect export of such waste to the ACP States while at the same time the ACP States shall prohibit the direct or indirect import into their territory of such waste from the Community or from any other country (Article 39). The Contracting Parties shall expedite adoption of the necessary internal legislation and administrative regulations to implement this undertaking. The term "hazardous waste" shall cover categories of wastes listed in the Basel Convention and the definitions of "radioactive waste" shall be those of the IAEA.

29. On 8 November 1986, an agreement between the government of Canada and the government of the United States of America concerning the Transboundary Movement of Hazardous Waste entered into force and ever since it has been renewed every five years (Article 13). The Parties have agreed to permit the export, import and transit of hazardous waste across their common border for treatment, storage or disposal pursuant to the terms of their domestic laws and the provision of the Agreement (Article 2) and will cooperate to ensure that all transboundary shipments of hazardous waste comply with the manifest requirements of both countries and of the Agreement (Article 5).

30. An agreement of cooperation between the United States of America and the United Mexican States regarding the transboundary shipments of hazardous wastes and hazardous substances was stipulated on 12 November 1986. The Parties ensure that activities associated with transboundary movements of hazardous waste shall be conducted so as to reduce or prevent the risks to public health, property and environmental quality, by effectively cooperating in regard to their export and import (Article 11). As problems are identified in the special circumstances of the United States-Mexico border relationship, additional cooperation, exchange of information and mutual obligations aimed at achieving when necessary a more stringent control of transboundary shipments shall be permitted (Article 10, paragraph 2).

31. The aim of the agreement on transboundary movement of toxic waste and other waste between the Government of the Kingdom of Sweden and the Government of the Kingdom of Morocco is to control exclusively the transboundary shipments from Morocco to Sweden of toxic waste and other waste, destined for recovery operations in Sweden.

#### **IV. WASTE MANAGEMENT HIERARCHY**

32. Hazardous waste management policies are today categorised by governments and international governmental organisations in the following order or priority:

- Prevention of the generation of hazardous wastes;
- Reduction at the source, of the quantity and hazardousness of the wastes nonetheless generated;
- Recovery of hazardous wastes;
- Final disposal of hazardous wastes.

33. Examples of policies advocated by international governmental organisations are shown in the Annex.

34. Special consideration should therefore be given by governments to taking appropriate steps to ensure that the generation of hazardous wastes within their territories is reduced to a minimum. An important component of this would be promoting the development and use of cleaner production methods applicable to activities generating hazardous wastes and the recovery of hazardous wastes unavoidably generated by such activities.

## **V. ASSESSMENT OF TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES DESTINED FOR RECOVERY OPERATIONS**

35. Wastes and hazardous wastes could be recovered in different ways, i.e. recycling to materials, recycling to energy recovery and chemical recovery. The choice between these different recovery options depends on the quality or property of the waste and is made according to economic and ecological considerations. For instance, the economics of recovery depends on, for example, the revenue from recovery (materials or energy), the cost of the operation, the savings compared to final disposal and cost of final disposal of residues coming out from recycling operations.

36. Economical and ecological constraints include lack of infrastructure or logistics, technical difficulties, low market demand, high costs of the operation, low income and payback profit, high investment costs, waste transportation\*, lack of trained personnel, emissions to air and contamination of soil and water, potential spills which would be subject to complex and expensive clean-up, lack of proper facility or site to dispose of residues from recovery operations, on-site storage costs, distance of recovery facilities away from the generator of waste and hazardous wastes, type of waste generation process used, and the price of virgin materials.

37. Generally, the streams that are recovered in the greatest volume are dilute waste streams containing a constituent that can be re-used in large-scale applications (i.e. spent acid and alkaline). Ferrous and non-ferrous metals as well as solvents are equally being recovered in large quantities. Non-ferrous secondary raw materials in particular can bear as high a value like ores or concentrates. The main waste stream exported for recovery is metals and metal components.

38. To be economically and technically viable for recovery, a stream usually should be uniform, it must not contain too many contaminants, and the recycled products must meet the purity requirements for manufacturing process. Recoverable wastes could be used as feedstocks in production processes or as substitutes for commercial products, in particular chemical products. Economically sound recycling activities depend on a viable and undistorted economic base. There must be a viable on-going market for the products. Unless there is a strong price advantage to recover a waste and recovery operations attain economies of scale equivalent to the production of goods from virgin materials, recovery may not be economically sound. The recovery operator, thus, needs to respond to the fluctuation of markets with a lot of flexibility, which in a number of cases regulations tend not to encourage. Major barriers to recovery include the availability of markets for collected and recovered wastes, costs of collection, market prices, public participation/acceptability, technology to recover, lack of training of personnel and education.

39. The lack of adequate and sufficient treatment facilities, reduction of available capacity for disposal on to land and into sea, coupled with increasing costs for disposal of hazardous wastes, are acting as strong stimuli for finding ways to reduce, minimize and recover wastes but also represent a drive to subject wastes to transboundary movements principally for economical reasons. In this regard, shipments of wastes for recovery to developing countries are often linked to low added value activities, which tend to produce large volumes of wastes (contrary to high added value

activities which produce smaller volumes of more complex wastes). These low added value activities are being increasingly exported to developing countries, often becoming the base for their industrialization.

40. The frequency and quantity of hazardous wastes exported for final disposal is not likely to continue to increase significantly. The demand for a number of recoverable wastes (e.g. ferrous and non-ferrous wastes and scrap) in developing countries may grow in the future. Lead recycling operations for instance are being developed in Latin America, Asia and Africa. 95% of hazardous wastes subject to transboundary movement between OECD and non-OECD countries are destined for recovery operations. Export of such wastes from OECD to non-OECD countries represents 1% of total OECD export.

41. In assessing recovery operations, the importance of the entire life-cycle approach of hazardous wastes needs to be stressed. The actual recovery process carried out at a facility is only one stage in the recovery chain. Other stages could have adverse environmental effects which may, in some cases, outweigh any benefits of reprocessing the recoverables. Also, recovery is influenced by such factors as product design, economic considerations, pollution potential, the use of financial instruments, the quality and specification of the recoverable waste and the scale of the operations. Consequently, that is why a number of different criteria are required for determining whether or not a waste is suitable for a recovery operation.

42. Increasing requirements for pre-treatment, high standards for treatment and increasing costs for disposal of hazardous wastes act as strong stimuli for waste reduction. Where prevention of the generation of hazardous wastes and reduction at source is not attainable, the recovery operation is an important element of environmentally sound management.

43. Criteria for assessing wastes and hazardous waste moving towards recovery operations, and for assessing the operations themselves, are set out in the following two chapters. They are based on consideration of:

- The history of waste management and its societal, environmental and economical implications.
- Promotion of waste avoidance through cleaner production methods and effective industrial and company waste audits.
- The need to ensure long term secure management options (including cleaner production methods).
- The need to enhance the standards of the recovery operation and disposal of the residues from recovery. This requires the identification and assessment of the processes used with regard to the prediction of health and the environment.
- The processing of the wastes consistent with environmentally sound and efficient management as close as possible to the source of generation.
- The management implications of technical changes and innovations.
- The innovative use of known technologies and development of new technologies.

- The need to prioritize on the hazardous waste streams in terms of quantities of material subject to transboundary movements and of problems associated with these; in particular research should be made on marketable recoverable materials which create the least pollution and quantity of waste by-products.

44. In any assessment it is also necessary to take into account the frequency and impacts of accidents which occur during or as a result of:

- The transboundary movements of the waste.
- The recovery operation itself.
- Final disposal of residues arising from the operation.

The expected average costs of an incident or accident need to be measured and adequate control procedures applied (i.e. establishment of an environmental impairment liability insurance covering recoverable materials and final disposal of residuals following recovery); the costs could include clean-up costs, environmental rehabilitation, etc. Containment and improvement of any potential damage should be considered. Determining the nature and severity of potential harm associated with the hazardous waste should form part of the overall risk analysis and contingency plans.

## **VI. CRITERIA FOR EVALUATION OF WASTES SUBJECT TO THE BASEL CONVENTION AND DESTINED FOR RECOVERY OPERATIONS**

45. Recovery can offer a number of economic and environmental benefits when undertaken in an environmentally sound manner. The following criteria provide guidance to the competent authorities on which wastes are likely to be suitable for transboundary movements towards recovery facilities. Not one of these questions should be considered in isolation. All should be taken together to create an overall picture of the suitability of the waste.

*What is the physical and chemical state of the hazardous waste product and/or mixture?*

46. There needs to be a clear description of the waste containing sufficient information to permit the competent authorities of the exporting and importing countries to judge the suitability of the waste for recovery.

It is also necessary to know the original process source of the material. To be economically and technically viable for recovery, a stream usually should be uniform, must not contain too many contaminants, and the recovered waste must meet the requirements for the manufacturing process.

Recovery operations or facilities for hazardous wastes can release toxic emissions or discharges to air, soil or water and as such represent a potential threat to human health and the environment. In many instances, wastes to be recovered can be contaminated with hazardous constituents which could, under certain circumstances, be concentrated as a result of processing operations, thereby having the potential to increase risks or the level of damage, if any.

*How much recoverable material will be obtained (percentage of feedstock)?*

47. A significant amount of hazardous wastes destined for recovery operations may actually end up in final disposal operations. This could be a valid outcome of the recovery process, but it could



indicate a sham transaction. It may be acceptable to have a small percentage of high value recoverable material. There are limits to the percentage of wastes that can be recovered imposed by the availability of technology and by economics, including market demand. There is also the need to assess, in certain cases, the permissible percentages of waste residues produced after processing.

*Where and how will the waste or hazardous waste generated by the recovery operation be finally disposed of?*

48. Residues arising from the recovery of hazardous wastes can be hazardous themselves, perhaps even more hazardous than the original wastes. Consequently, environmentally sound and safe disposal of these wastes should be ensured.

*What is the economic value of the waste, bearing in mind price fluctuations?*

49. Recoverable wastes could be used as feedstocks in production processes. However, economically sound recovery activities depend on a viable economic basis, which includes the cost of recovery operations, the cost avoidance of disposal, and the market price of products. A waste for which there is a viable on-going market for the products is more likely to be managed in an environmentally sound manner. Consolidated large-scale processing offers economies of scale which can make the recovery more viable.

*Is the waste routinely traded internationally through established channels and is that evidenced by commercial transactions and contracts?*

50. Shipments of hazardous wastes to developing countries for recovery could entail disposal or attempted disposal of such wastes in countries that do not possess, and are unlikely to possess in the near future, environmentally sound waste disposal/recovery facilities. A material for which there is an established international market is more likely to be intended for legitimate recovery rather than a sham transaction.

*What is the nature and use of the product of the recovery operations?*

51. There must be a viable on-going market for the products of recovery operations. The recovered products must have a legitimate use. Sham recovery could include the use of certain wastes in undesirable ways which, in controlled conditions, would be prevented from being recovered in such a way because of their hazardous characteristics.

## **VII. CRITERIA FOR THE EVALUATION OF ENVIRONMENTALLY SOUND RECOVERY OPERATIONS**

52. Environmentally sound management is defined in the Basel Convention as taking all practicable steps to ensure that hazardous wastes or other wastes are managed in a manner which will protect human health and the environment against adverse effects which may result from such wastes.

53. The Technical Working Group of the Basel Convention has developed a Framework Document on the Preparation of Technical Guidelines for the Environmentally Sound Management of Wastes subject to the Basel Convention (19/07/93) which has been adopted by the second meeting of the Conference of the Parties in March 1994.

54. Criteria for the evaluation of environmentally sound recovery operations include the following<sup>5</sup>:

- a) There exists a regulatory infrastructure and enforcement that ensures compliance with applicable regulations;
- b) Sites or facilities (including storage) are authorized and of an adequate standard of technology and pollution control to recover the hazardous waste in the way proposed, in particular taking into account the level of technology and pollution control in the exporting country, and have the technical capacity to recover the waste as proposed;
- c) Operators of sites or facilities at which hazardous wastes are recovered are required, as appropriate, to monitor the effects of those activities;
- d) Appropriate action is taken at the site or facility in the case of accidental spillage, and in cases where monitoring gives indication that the recovery of hazardous wastes have resulted in unacceptable emissions;
- e) Persons involved in the recovery of hazardous wastes are capable and adequately trained;
- f) Any residues from the recovery operations and portions of unrecovered materials should be managed including final disposal;
- g) Evidence of an action plan for emergencies or accidents covering the recovery operation or at the recovery facility.

### **VIII. ADVANTAGES TO BE GAINED FROM RECOVERY OF WASTES**

55. Environmental and economic benefits can be derived, in certain cases, from the movement of wastes subject to the Basel Convention and destined for recovery to facilities with adequate infrastructure and logistics, appropriate technology, sufficient economic viability and reduced negative environmental impacts through proper management of residuals, whether hazardous or not. Such movements across international boundaries could in some cases result in a transportation distance that is less than would be the case for movement to domestic facilities.

56. Environmentally sound recovery of wastes subject to the Basel Convention would have the potential to reduce the size and generally reduce the hazard potential of waste streams. It should promote energy savings and/or act to reduce the demand for increased exploitation of natural resources. Recovery industries provide materials that compete economically with primary materials in international and domestic markets.

57. Environmentally sound recovery normally reduces the quantity of residuals which would otherwise go to final disposal, even considering the need for disposal of residual materials from the recovery process in an environmentally sound manner. In cases where the element causing the waste to be subject to the Basel Convention is the object of the recovery, the recovery operation reduces the amount of this element in the residue.

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<sup>5</sup> Points d), e) and g) should be assessed by the competent authority of the State of import.

58. Shipments of wastes subject to the Basel Convention and sent from developing countries to recovery operations in other countries can result in recovery with fewer total emissions to air, water and soil and result in the creation of less hazardous residue that is managed in an environmentally sound manner than would be the case if the waste were recovered in countries which lack adequate waste management infrastructure for such wastes.

59. Wastes subject to the Basel Convention and destined for recovery operations may contain higher levels of desired elements than are contained in primary ore deposits. Such wastes may also, in many cases, require less energy to be processed to an equivalent degree than is required to equivalently process the primary material. Further, there could be fewer negative environmental consequences associated with the recovery of elements from wastes subject to the Basel Convention than from production of equivalent elements from primary sources. Consolidated large-scale processing of such wastes destined for recovery can offer economies of scale which can make recovery more viable and therefore decrease the need for landfilling or other final disposal of such wastes.

## **IX. PROBLEMS ASSOCIATED WITH RECOVERY OF WASTES**

60. The transboundary movements of wastes subject to the Basel Convention and destined for recovery could nonetheless result in problems if not carried out in an environmentally sound manner. Despite the benefits associated with such recovery, as described above, there may be circumstances which would require the objection of exporting or importing competent authorities to approve requests for such international movements.

61. As with any industrial process, a recovery operation may have a certain impact on the environment and/or human health either through normal operations or as a result of accidents (see paragraph 38). These impacts could be aggravated if the operation itself or the transboundary movement of wastes is not conducted in a safe or proper manner.

62. Where wastes subject to the Basel Convention are exported for recovery because costs are lower than in the country of export, this may act as a disincentive to waste avoidance through the adoption of cleaner production methods. Such a situation could also perpetuate the use of certain substances for which substitutes should be found because of the hazards they pose.

63. Exports of wastes subject to the Basel Convention for recovery operations can be used to avoid legislation regulating recovery operations or disposal operations in the country of generation of such wastes.

labelled as destined for recovery operations to actually end up in final disposal operations. Sham recovery could also include the re-use, in certain conditions, because of their hazardous characteristics, should not be recovered in such a way.

65. Recovery operations or facilities for hazardous and other wastes can release toxic emissions or discharges to air, soil or water and as such represent a potential threat to human health and the environment. In many circumstances, wastes to be recovered are contaminated with hazardous constituents which could be concentrated as a result of processing operations. In certain circumstances, this will increase risks or the level of damage.

66. Often, the residues arising from the recovery of wastes subject to the Basel Convention can be hazardous themselves, perhaps more hazardous (toxic, poisonous, ecotoxic, etc) than the original wastes due to higher concentrations of the hazardous constituents. Consequently, environmentally sound and safe disposal of these wastes should be ensured.

67. Shipments of hazardous wastes from industrialized and other countries to developing countries, for recovery and final disposal of residues, could entail disposal or attempted disposal of such wastes in countries that do not possess, and are unlikely to possess in the near future, environmentally sound waste disposal/recovery facilities.

68. In practice, some recoverable materials are not sufficiently well characterized to permit identification of potential problems. There are limits to the percentage of wastes that can be recovered imposed by the availability of technologies and by economics, including market demand. These and other factors, such as the hazardousness of the wastes and workers' safety, will have influence on the feasibility and quality of the recovery operation.

## **X. AUTHORIZING TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES**

69. The above checklist of criteria is meant to be used by the competent of concerned authorities in assessing the environmental soundness of recovery operations, the suitability of the wastes or hazardous waste to be recovered and consequently the desirability of effecting a transboundary movement of such wastes for recovery. These criteria can usefully be expressed as a series of questions which the authority could use to seek clarification about a particular recovery operation. The questions which are set out below are addressed to the generator, exporter, importer, carrier, or disposer of the wastes or hazardous wastes to be recovered.

- What is the physical and chemical state of the hazardous waste product and/or mixture?
- How much recoverable material will be obtained (percentage of feedstock)?
- Will the recovery/recycling operation generate any hazardous wastes? How is any portion separated from the waste but not subject to recovery/recycling managed?
- Where and how will the waste or hazardous waste generated by the recovery/recycling operation be finally disposed of?
- What are the types of residues arising from the disposal operation?
- Will the hazardous waste be stored prior to recovery/recycling operations? Is the storage environmentally adequate?
- What methods will be used to dispose of the residues arising from recovery operations?
- What are the type and quantity of releases to the environmental media from such operations?
- What are the measures taken to reduce emissions or discharges to the environment?

- What is the degree of difficulty of clean-up in the case of accidental spillage or mismanagement?
- What is the economic value of waste, bearing in mind price fluctuations?
- Is there a technical capacity to recover/recycle the waste?
- Is there a history of adverse environmental incidents arising from transboundary movements of the waste destined for recovery/recycling operations?
- Is the waste routinely traded through established channels and is that evidenced by commercial transactions?
- What are the overall environmental benefits arising from the recovery/recycling operations?
- What is the extent of use of the waste subjected to recovery/recycling operations?
- Has the State of export assessed the facilities, technologies and regulations in the State of import?

70. The granting of an authorization, permit or licence for a transboundary movement of hazardous wastes should be conditional on evidence of:

- sufficient relevant skills of the applicant and his personnel;
- the technical and economic capacity required for collecting, transporting and recycling the waste; and
- a sufficient financial standing of the applicant in view of the nature and scale of the operations, or of the subscription of a corresponding third party liability insurance or other adequate financial guarantee covering any damage that would result from the operations.

71. The authorization could be limited to apply only to certain types of wastes or to wastes from particular installations or areas. Recovery should only take place in facilities operating in accordance with an approved waste management plan or holding an appropriate hazardous waste disposal/recovery authorization, permit or licence. For export, the Competent Authority of the State of export has to be convinced that the waste destined for recovery will be managed in an environmentally sound way in the State of import. Importing countries may find it useful to

must fulfil all domestic requirements concerning public health and environmental protection. Withdrawal of an authorization, permit or licence should be considered if non-compliance to the above requirements is evidenced. The generator, the exporter, the carrier or the disposer should be able to describe satisfactorily the wastes to be moved across frontiers in terms of its potential hazard, activity generating the wastes, its physical and chemical forms, generic descriptor, its constituents, the reasons for disposal and the disposal operation the wastes will be subject to (refer to Annex V of the Basel Convention). Also, proper management requires that the extent of recovery of the waste be known as well as, if appropriate, the potential for increased recovery of the waste.

72. It is equally important to obtain reliable data concerning the recovery from a wide variety of hazardous wastes, and on quantities of wastes subjected to recovery operations and moved across frontiers. The minimum core of the information required to classify the wastes should appear in transport and other manifest documents used to control transboundary movements (i.e. notification form, movement document). It includes:

- The technical name in words; the hazard class/division; the United Nations serial number; the flash point in degrees Celsius if required and the references to the Basel Convention nomenclature (Y and H).

## **XI. CONCLUSIONS AND RECOMMENDATIONS**

73. This document has presented an explanation of the benefits of the recovery of wastes and hazardous wastes and the problems that can be associated with it. Elements seen as essential to ensure environmentally sound recovery of such wastes have been described together with the requirements of the Basel Convention concerning the control of proposed transboundary movements of wastes subject to the Convention and destined for recovery operations. The proper assessment of the recovery operations and the suitability of wastes or hazardous wastes to be recovered shall provide a base upon which the competent or concerned authorities in the State of export and in the State of import respectively will form their judgement as to the environmental soundness of a proposed transboundary movement of such wastes intended for recovery.

74. It is recommended that in coming to a conclusion about whether or not a recovery operation is environmentally sound, competent or concerned authorities take into account the interrelated criteria set out in this document. Authorities might find the checklist of questions in chapter X, a useful way of seeking the information needed to assess the recovery operation against the criteria.

75. The Technical Working Group of the Basel Convention considers that work is required to further the understanding of the environmentally sound recovery operations in the following areas:

- Overview of the current state of the best available recovery technologies in use worldwide and extensive examination of existing recovery industry and wastes most commonly recovered.
- Collection and analysis of information on existing economically viable markets for wastes destined for recovery operations.
- Collection and analysis of data on transboundary movements of the wastes subject to the Basel Convention and destined for recovery operations, including movements to/from developing countries.
- Improved specifications (physical/chemical) of the most commonly traded materials destined for recovery operations to better determine whether or not such waste will actually be controlled under the procedures established by the Convention, and the further development of criteria for hazardous characteristics for the classes H10 to H13 (Annex III of the Convention).

- Assessment of the magnitude of illegal traffic, and the reasons for its occurrence.
- Collection and analysis of the frequency of accidents involving transboundary movements of hazardous wastes, including their impact and related costs.
- Case studies on environmentally sound recovery operations.
- Identification of the most adequate recovery technologies, from the environmental and economical point of view, to developing countries.

## Annex

### WASTE MANAGEMENT HIERARCHY

1. Chapter 20 paragraph 20.7 a) of UNCED Agenda 21 stipulates that one of the overall targets of environmentally sound management of hazardous wastes include:

"Preventing or minimizing the generation of hazardous wastes as part of an overall integrated cleaner production approach; eliminating or reducing to a minimum transboundary movements of hazardous wastes, consistent with the environmentally sound and efficient management of those wastes; and ensuring that environmentally sound hazardous waste management options are pursued to the maximum extent possible within the country of origin (the self-sufficiency principle). The transboundary movements that take place should be on environmental and economic grounds and based upon agreements between the States concerned".

Chapter 20 (paragraph 20.11 b) identifies recovery as one of the objectives of the programme area of UNCED Agenda 21, namely:

"To optimize the use of materials by utilizing, where practicable and environmentally sound, the residues from production processes".

In addition, Chapter 20 (paragraph 20.17 d) of Agenda 21 recommends that "States should encourage industry to exercise environmentally responsible care through hazardous waste reduction and by ensuring the environmentally sound re-use, recycling and recovery of hazardous wastes, as well as their final disposal".

2. The Ad hoc meeting of Government-designated experts which developed, under the aegis of UNEP, the elements of an international strategy and an action programme, including technical guidelines, for environmentally sound management of hazardous wastes (Nairobi, 9-11 December 1991) refers in its report (UNEP/CHW/WG.2/1/3), under paragraph 3, to the fact that governments have asserted that the appropriate strategy for dealing with waste is to:

- a) Prevent the generation of wastes;
- b) Reduce to a minimum the wastes generated by economic activities;
- c) Recover, re-use and recycle the greatest possible quantity of those wastes which are still generated;
- d) Dispose of, in an environmentally sound manner, any remaining wastes, e.g. by incineration, physico-chemical treatment, etc.

3. The Technical Working Group of the Basel Convention recognizes that waste management is a recent activity which is designed to identify and manage wastes throughout their entire life cycle with a strong emphasis on reduction, re-use and recycling activities (Framework Document on the preparation of technical guidelines for the environmentally sound management of wastes subject to the Basel Convention).



The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal was adopted in 1989 and entered into force in 1992. Presently, there are more than 150 Parties to the Basel Convention. Its objective is to protect human health and the environment from the adverse effects caused by the generation, management and transboundary movements of hazardous wastes.

The fundamental aims of the Basel Convention are the reduction of the transboundary movements of hazardous wastes, the prevention and minimization of their generation, the environmentally sound management of such wastes and the active promotion of the transfer and use of cleaner technologies.

In December 1999, the Parties to the Basel Convention adopted the Basel Protocol on Liability and Compensation for Damage resulting from the Transboundary Movements of Hazardous Wastes and Their Disposal.

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