



Distr.: General
11 August 2017

Original: English

**Conference of the Parties to the Basel Convention
on the Control of Transboundary Movements of
Hazardous Wastes and Their Disposal
Thirteenth meeting**

Geneva, 24 April–5 May 2017
Agenda item 4 (a) (ii)

**Matters related to the implementation of the Convention:
strategic issues: follow-up to the Indonesian-Swiss
country-led initiative to improve the effectiveness of the
Basel Convention**

**Follow-up to the Indonesian-Swiss country-led initiative to
improve the effectiveness of the Basel Convention**

Addendum

**Set of practical manuals for the promotion of the environmentally sound
management of wastes**

Note by the Secretariat

At its thirteenth meeting, the Conference of the Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal adopted, in decision BC-13/2 on follow-up to the Indonesian-Swiss country-led initiative to improve the effectiveness of the Basel Convention, the set of practical manuals for the promotion of the environmentally sound management of wastes, on the basis of the revised set of draft practical manuals contained in document UNEP/CHW.13/4/Add.1. The practical manuals referred to above were prepared by the expert working group on environmentally sound management, taking into account comments received from Parties and others pursuant to decisions BC-12/1 and OEWG-10/2. The text of the final version of the practical manuals, as adopted, is set out in the annex to the present note. The present note, including its annex, has not been formally edited.

Annex

A set of practical manuals for the promotion of the environmentally sound management of wastes

Final revised version (5 May 2017)

A Set of Practical Manuals for the Promotion of the Environmentally Sound Management of Wastes

Developed by the Expert
Working Group on
Environmentally Sound
Management

**Basel
Convention**

Foreword

In its decision BC-11/1 on follow-up to the Indonesian-Swiss country-led initiative to improve the effectiveness of the Basel Convention, the Conference of the Parties mandated an expert working group to further elaborate and implement actions on initial short-term work items listed in annex II to the decision, within available resources, and to develop a work programme for additional priorities and key work items and actions for the implementation of environmentally sound management (ESM).

Paragraph 1 of annex II to decision BC-11/1, which contains the terms of reference for the expert working group on environmentally sound management, requested the group to, among other things, collect available information on national and other ESM standards and practices and to develop generic guidance on how to establish ESM.

At its first meeting in December 2013, the expert working group decided to develop, intersessionally and at successive meetings, the following practical manuals for the promotion of the environmentally sound management of wastes:¹

- (a) Terminology included in the practical manuals for the promotion of the ESM of wastes (appendix I);
- (b) General policies and legislation (appendix II);
- (c) Permits, licenses or authorizations (appendix III);
- (d) Certification schemes (appendix IV);
- (e) Waste prevention (appendix V).

The manuals, which have been developed to complement the framework for the environmentally sound management of hazardous wastes and other wastes (ESM Framework),² are intended to provide non-exhaustive practical guidance to those stakeholders responsible for ensuring the environmentally sound management of wastes at the national level. Such stakeholders may include competent authorities and focal points designated by Parties to the Basel Convention, policy makers, legislators, enforcement authorities, operators of waste management facilities and other entities involved in the overall management, i.e. the collection, transport and disposal, including storage, of wastes.

The manuals were submitted to the twelfth meeting of the Conference of the Parties, at which time it was decided to include provision for their further development and finalization in the work programme of the expert working group adopted by the meeting in decision BC-12/1 (annex). Further revisions of the manuals were submitted to the Open-ended Working Group for consideration at its tenth meeting and subsequently to the Conference of the Parties for consideration and possible adoption at its thirteenth meeting. The Conference of the Parties adopted the set of practical manuals for the promotion of the environmentally sound management of wastes at its thirteenth meeting by decision BC-13/2.

¹ Development of a sixth manual on insurance and liability was commenced by the expert working group but not finalized. At its third meeting in January 2015, the group agreed to cease work on the manual and await the outcome of the work of the Implementation and Compliance Committee on this issue.

² Adopted by decision BC-11/1 and available in document UNEP/CHW.11/3/Add.1/Rev.1 (annex) and at: <http://basel.int/Implementation/CountryLedInitiative/EnvironmentallySoundManagement/Overview/tabid/3615/Default.aspx>.

Appendix I

Terminology included in the Practical Manuals for the Promotion of the Environmentally Sound Management of Wastes

Basel
Convention

I. Introduction

1. This document has been prepared to accompany the practical manuals for the promotion of the environmentally sound management (ESM) of wastes. These manuals are directly related to the Basel Convention framework¹ for the environmentally sound management of hazardous wastes and other wastes.²

2. To help understand the terms in this manual and why they are used, it is important to understand the legal context within which they sit, in particular that:

(a) Hazardous and other wastes are to be managed in a manner which will protect human health and the environment against the adverse effects which may result from such waste;³

(b) Transboundary movements of hazardous and other wastes subject to the Basel Convention should be reduced to the minimum consistent with their environmentally sound and efficient management;⁴

(c) The generation of hazardous and other wastes should be minimized.⁵

3. Additionally, in its decision BC-11/1 on follow-up to the Indonesian-Swiss country-led initiative to improve the effectiveness of the Basel Convention, the Conference of the Parties requested a small intersessional working group on legal clarity to, among other things, complete a glossary of terms in an effort to provide Parties and others with consistent advice on the interpretation of certain terminology in the Basel Convention. The Conference of the Parties at its twelfth meeting, in its decision BC-12/1 invited the small intersessional working group on legal clarity to continue its work and to prepare a revised version of this draft glossary and the Open-ended Working Group at its tenth meeting, in its decision OEWG-10/8, welcomed the work undertaken by the small intersessional working group on legal clarity and recommended that the Conference of the Parties at its thirteenth meeting adopt the glossary of terms developed by the small intersessional working group on legal clarity (see document UNEP/CHW.13/4/Add.2). The Conference of the Parties adopted the glossary of terms at its thirteenth meeting by decision BC-13/2. This manual has been developed in consideration of the work of the small intersessional working group on legal clarity and does not duplicate the terms defined in the aforementioned glossary.

4. The terminology in this manual is intended to assist in the understanding of the practical manuals for the promotion of the environmentally sound management of wastes, rather than provide a legal definition of the terms in question. It is not intended to have broader application or represent an interpretation of the Basel Convention.

5. It should be recognized that each country may have its own definitions of certain terms, for example, “permit”, “license” or “authorization”, in its national legislation.

¹ Adopted by decision BC-11/1 and available in document UNEP/CHW.11/3/Add.1/Rev.1 (annex) and at: <http://basel.int/Implementation/CountryLedInitiative/EnvironmentallySoundManagement/Overview/tabid/3615/Default.aspx>.

² Article 1 paragraph 2 read in conjunction with annex II of the Basel Convention defines the term “other wastes” as ‘Y46 Wastes collected from households’ and ‘Y47 Residues arising from the incineration of household wastes’.

³ Article 2 paragraph 8 defines the term “environmentally sound management of hazardous wastes or other wastes” 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 the adverse effects which may result from such wastes. Additionally, the Basel Convention refers to ESM of waste in the following provisions: Preamble; Article 4 paragraphs 2, 8 and 10; Article 6 paragraph 3 (b); Article 10.

⁴ Article 4 paragraph 2 (d) of the Basel Convention.

⁵ Article 4 paragraph 2 (a) of the Basel Convention.

II. List of acronyms⁶

BAT	Best available techniques
BEP	Best environmental practices
BREF	Best available techniques reference document
EIA	Environmental impact assessment
EMAS	Eco-Management and Audit Scheme
EMS	Environmental management system
EPEAT	Electronic Product Environmental Assessment Tool
EPR	Extended producer responsibility
ESM	Environmentally sound management
EWG	Expert working group
ISO	International Organization for Standardization
NGO	Non-governmental organization
NSB	National Standards Body(ies)
OECD	Organization for Economic Cooperation and Development
OHSAS	Occupational Health and Safety Assessment Series
OSH	Occupational safety and health
PIC	Prior informed consent
POP	Persistent organic pollutant
SAICM	Strategic Approach to International Chemicals Management
SME	Small and medium-sized enterprise
TBM	Transboundary movement (of wastes)
UNEP	United Nations Environment Programme
WEEE	Waste electrical and electronic equipment

⁶ Chemical abbreviations, country codes, and trade names are not listed.

III. Terminology⁷

Accreditation	The formal recognition by an independent body, generally known as an accreditation body, which signifies that a certification body is capable of carrying out certification. Accreditation is not always obligatory but it adds another level of confidence, as ‘accredited’ means the certification body has been independently checked to make sure it operates according to international standards. The International Accreditation Forum provides the contact details of national accreditation bodies. National accreditation bodies keep lists of accredited certification bodies or individuals for each country. (See certification)
Authorization	A written decision (or several such decisions) delivered by the designated authority approving the operation of a waste management facility and/or activity, subject to certain conditions which guarantee that the facility or activity complies with all the requirements established. This definition is the same as for “license” and “permit”.
Broker	Anyone arranging the recovery or disposal of waste on behalf of others, including such brokers who do not take physical possession of the waste.
Certification	The provision by an independent body of written assurance (a certificate) that the product, service or system in question meets specific requirements. For example, the International Organization for Standardization (ISO). (See accreditation)
Damage	Damage ⁸ includes: (i) Loss of life or personal injury; (ii) Loss of or damage to property; (iii) Loss of income directly deriving from an economic interest in any use of the environment, incurred as a result of impairment of the environment.
Designated authority	Institution responsible for the development, implementation and enforcement of a regulation and/or other measure. In some countries, the designated authority is also the competent authority.
Environmental management system	A set of processes and practices that enable an organization to reduce its environmental impacts and increase its operating efficiency. A waste facility should have an environmental management system (EMS) in place, taking into account the size of the enterprise, the level of risk associated with the operation of the facility and other factors relevant to implementation. An EMS is often designed to be integrated into the “plan, do, check and act” model for continuous improvement and many existing systems already use this approach. It helps to ensure that environmental issues are systematically identified, controlled and monitored in the context of the need to reinforce continuous improvement. Several applicable EMS already exist in countries which are members of the Organization for Economic Cooperation and Development (OECD): ISO 14001, which is worldwide; the Eco-Management and Audit Scheme (EMAS), which is specific to European countries and has somewhat more ambitious requirements than ISO 14001. Also considered to be applicable EMS are those that are tailor-made for individual circumstances – for example, systems designed for the purpose of specific industrial sectors or enterprises.

⁷ Refer to Article 2 of the Basel Convention for further definitions.

⁸ Refer to Article 2 of the Protocol on liability and compensation for damage resulting from transboundary movements of hazardous wastes and their disposal for the full definition of the term “damage”.

<i>First-party verification / Self-certification</i>	The practice of giving information about oneself or one's company in a formal statement rather than asking a third party to do so. For example, ISO 14001 has self-certification as an option; alternatively users may choose third-party verification and certification. (See second-party verification and third-party verification)
<i>License</i>	A written decision (or several such decisions) delivered by the designated authority approving the operation of a waste management facility and/or activity, subject to certain conditions which guarantee that the facility or activity complies with all the requirements established. This definition is the same as for "authorisation" and "permit".
<i>Life cycle</i>	The entire life cycle, from the extraction of natural resources and including material processing, manufacturing, marketing, distribution, use and waste management.
<i>Management system standards</i>	Standards that provide a model to follow when setting up and operating a management system. An organization or company assesses its current situation, fixes objectives and develops policy, implements actions to meet these objectives and then measures the results. With this information the effectiveness of the policy, and the actions taken to achieve it, can be continually reviewed and improved. It is noted that all ISO management system standards are based on the principle of continual improvement i.e. the "plan, do, check, act" model.
<i>Minimization</i>	Waste minimization includes strict avoidance, source reduction, direct reuse, reuse and recycling.
<i>Monitoring</i>	Periodic or continuous surveillance or testing to determine the level of compliance with management system requirements, or process requirements, or statutory requirements, for example, of material flows or of compliance with values limiting emissions to air and releases to land and water.
<i>Permit</i>	A written decision (or several such decisions) delivered by the designated authority approving the operation of a waste management facility and/or activity, subject to certain conditions which guarantee that the facility or activity complies with all the requirements established. This definition is the same as for "authorisation" and "license".
<i>Prevention</i>	Practical actions that reduce the waste quantity and/or the hazard potential and/or the hazardous content of products and materials prior to becoming wastes. Prevention may include strict avoidance, source reduction and direct reuse.
<i>Second-party verification</i>	Where a certified company hires an audit firm, which is not a member of an independent certified body, to verify conformity with the standard. (See first-party verification and third-party verification)
<i>Source reduction</i>	Altering production processes to minimize the use of toxic or harmful substances and/or minimizing material or energy consumption and/or maximally substituting primary raw materials with secondary raw materials that result from high quality recycling.
<i>Standards</i>	Standards exist principally to provide a reliable basis on which common expectations can be shared regarding specific characteristics of a product, service or process. Standards have become a tool through which industry can demonstrate their commitment to best practices to policymakers, regulators, customers and the general public. Governments may choose to make such standards mandatory.
<i>Storage</i>	Activity where waste is stored prior to disposal on site or for unloading in order to allow its preparation or handling for further transport for disposal elsewhere. National legislation may apply various time limitations on the length of storage.

<i>Strict avoidance</i>	Involves the prevention of waste generation by elimination of the need for a product or material, or by a reduction of hazardous substances and inputs, or by reducing material or energy intensity in production, consumption, and distribution. Also includes designing products for prolonged life. Waste prevention in this latter context extends the product life and acts as a diversion of waste flows.
<i>Third-party verification</i>	Where the certified company uses an independent certification body (that is accredited by a formal accreditation body) to verify conformity with the standard. (See first-party verification and second-party verification)
<i>Treatment</i>	Treatment options are listed in annex IV to the Basel Convention. This term is used in differing ways in different countries. For example, in some countries treatment includes any physical, chemical, biological or mechanical activity and in others it includes all recovery and final disposal operations.
<i>Waste management hierarchy</i>	Recognized by decision BC-10/2 as prevention, minimization, reuse, recycling, other recovery including energy recovery, and final disposal; in doing so, encouraging treatment options that deliver the best overall environmental outcome, taking into account life-cycle thinking.

Appendix II

General Policies and Legislation

Basel
Convention

I. Introduction

1. This manual seeks to practically outline what should be in place to ensure a Party has the information and tools necessary to implement the Basel Convention and ensure ESM at a national level. It builds on currently available information and guidance on implementation and enforcement of the Convention.¹
2. This manual is geared towards policy makers; legislators; focal points and competent authorities.

II. Policy principles and approaches related to ESM

3. When establishing general policies and legislation for the promotion of environmentally sound management of wastes, the following principles and approaches related to ESM should be taken into consideration. These are detailed in the Strategic Framework,² the ESM Framework³ and the Rio Declaration.⁴ Short references as to how these relate to ESM are included below.

A. Precautionary

4. This approach means that where there are threats of serious or irreversible environmental damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.
5. In the context of ESM, this generally means that if we are uncertain about the potential environmental damage that may be caused by waste-related activities, we should take precautions to prevent damage occurring.

B. Prevention

6. This principle means that practical actions should be taken to reduce the waste quantity and/or the hazard potential and/or the hazardous content of products and materials prior to them becoming wastes.

C. Sustainability: principle of intergenerational equity

7. This principle means that the current generation should make sure that the health, diversity and productivity of the environment continues for the benefit of future generations.

D. Polluter pays

8. The “polluter pays” principle means that the costs of pollution and waste should be borne by those who cause the pollution or generate waste. National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the costs of pollution, with due regard to the public interest and without distorting international trade and investment. For example, by promoting improved valuation, pricing and incentive mechanisms or by making sure that the price of products reflects the true costs of both production and disposal when a product becomes waste.

E. Public participation in decision-making

9. This principle means individuals should have the opportunity to participate in environmental decision-making processes. There are different opportunities to participate in decision-making, depending on the rights given to the public under different laws.

¹ A tool developed in the Basel Convention context for the development of legal frameworks is the Manual for the implementation of the Basel Convention (available in document UNEP/CHW.12/9/Add.4/Rev.1 (annex) and at: <http://www.basel.int/Implementation/LegalMatters/LegalFrameworks/Tools/tabid/2750/Default.aspx>).

² Strategic framework for the implementation of the Basel Convention for 2012 – 2021 (Strategic Framework) (available in document UNEP/CHW.10/3 (annex)).

³ Framework for the environmentally sound management of hazardous wastes and other wastes (ESM Framework) (available in document UNEP/CHW.11/3/Add.1/Rev.1 (annex)).

⁴ Rio Declaration on Environment and Development (1992).

F. Access to information and to justice

10. This means providing individuals appropriate access to information concerning the environment that is held by public authorities. Effective access to judicial and administrative proceedings, including redress and remedy, should be provided.

G. Environmental justice

11. The goal of environmental justice is the fair treatment and meaningful involvement of all people regardless of race, colour, national origin or income, with respect to the development, implementation and enforcement of environmental laws, regulations, and policies.

H. Proximity/Least transboundary movement

12. Waste should be treated or disposed of as near as possible to the point where it is generated. This principle is derived from:

(a) Article 4, paragraph 2 (b) of the Basel Convention, which states that each Party shall take appropriate measures to 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;

(b) Article 4, paragraph 2 (d), which states that each Party shall take appropriate measures to ensure that the transboundary movement of hazardous wastes and other wastes is reduced to a 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.

I. Responsibility for ESM

13. This principle, based on Article 4 paragraph 10 of the Basel Convention, means that the responsibility for ESM of hazardous waste and other waste generated within a state cannot be transferred to another state.

J. Waste management hierarchy

14. The hierarchy provides a framework for waste management practices. Stakeholders should respect the waste management hierarchy (prevention, minimization, reuse, recycling, other recovery including energy recovery, and final disposal).

15. The Strategic Framework for the implementation of the Basel Convention for 2012-2021⁵ recognizes the waste management hierarchy and, in applying this hierarchy, encourages treatment options that deliver the best overall environmental outcome, taking into account life-cycle thinking.

III. Establishment of a framework for ESM (legal and policy)

16. The importance of establishing a comprehensive legal framework and policies, consistent with the above principles, has been highlighted on numerous occasions in relation to the Basel Convention.⁶

A. Legal framework

17. Each Party should establish a legal framework, regulations and other measures to meet its obligations under the Convention to ensure ESM is implemented. Additionally, each Party should designate one focal point and one or more competent authorities.⁷

18. Each Party should provide a sufficient mandate and sufficient resources to enable the focal point and competent authority or competent authorities to fulfil their responsibilities under the Convention. This could be provided for in national legislation, for example.

19. Each Party should determine what regulatory infrastructure and enforcement framework already exists, as well as review the country's capacity to manage hazardous wastes and other wastes

⁵ ESM Framework, part II, paragraph 3 (a) (available in document UNEP/CHW.11/3/Add.1/Rev.1 (annex)) also recognizes the waste management hierarchy (prevention, minimization, reuse, recycling, other recovery including energy recovery and final disposal) as a guiding principle. See also EMS Framework, part IV on guiding principles.

⁶ For example, ESM Framework, part V, section C on strategies to implement environmentally sound management.

⁷ Article 2 of the Basel Convention defines the terms "competent authority" and "focal point".

in relation to the quantities of waste generated, to determine what arrangements are necessary to support the implementation of the Convention. Indicators to measure progress may include:

- (a) Legal instruments or requirements to implement and enforce the provisions of relevant international and/or regional instruments are in place;
- (b) Schemes at the national or regional level to foster continual improvement within the waste management sector have been developed and implemented;
- (c) Checklists for inspectors to support regular inspections and enforcement have been developed and implemented.

Further information on such indicators of performance is available in the ESM Framework.⁸

B. Identify and engage key stakeholders

20. It is important to identify and engage both citizens (who bring knowledge and perspective) and technical advisory groups (that bring expertise) to support the development and sustainable implementation of national legislation and other measures related to ESM. Technical advisory groups could be comprised of such stakeholders as civil society, industry, academia and other relevant stakeholders. Consultation and engagement should be considered during development of any implementing legislation and measures, and maintained on an ongoing basis thereafter. Each Party should be mindful of the goal of environmental justice for the fair treatment and meaningful involvement of all people regardless of race, colour, national origin or income, with respect to the development, implementation and enforcement of environmental laws, regulations, and policies.⁹

21. Negative economic and environmental impacts of the informal waste collection and management sector on the efficacy of ESM strategies can be critical. Therefore, in creating national legislation and other measures related to implementation of ESM, the scope and effect of the informal sector should be understood and taken into consideration. Strategies should be developed for establishing channels of communication with the informal waste sector, as well as for providing economic and other incentives for transforming or formalizing their activities.

C. Synergies

22. Each Party should be mindful that waste is but one medium that should be addressed in a holistic fashion in terms of protection of human health and the environment. Measures and legislative provisions aimed at fostering the ESM of hazardous wastes and other wastes are interconnected with initiatives addressing other environmental mediums or threats to human health and the environment, whether on the national or international level.

23. On the international level, the Party may wish to take into consideration interconnections with other related institutional mechanisms, such as the Stockholm Convention on Persistent Organic Pollutants (POPs), the Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, the Strategic Approach to International Chemicals Management (SAICM), as well as the Minamata Convention on Mercury, among others.

24. As noted above, on the national level, legislation and regulations addressing waste should be considered holistically, and implemented in concert with legislation and regulations addressing the production of certain products; occupational safety and health (OSH); toxic substance control, including pesticides; emergency planning; public access to information; and/or legislation and regulations addressing all other environmental media including marine eco-systems.

IV. Practical arrangements for implementing ESM

A. Institutions

25. In order to implement the Convention, a number of institutional arrangements should be in place within each Party to ensure ESM including:¹⁰

⁸ See ESM Framework, part VIII on indicators for the verification of performance.

⁹ See ESM Framework, Annex I on guiding principles.

¹⁰ It is recognized that the implementation of ESM is an evolutionary process that takes time to achieve and that existing provisions can vary greatly from country to country and from facility to facility. The capabilities and challenges faced by least developed countries, developing countries and countries with economies in transition need to be considered.

- (a) Administrative mechanisms/bodies to:
 - (i) Liaise with and inform relevant stakeholders;
 - (ii) Collect and disseminate data; and
 - (iii) Coordinate with the Basel Secretariat, other Basel Parties and other stakeholders as necessary with regards to transmission of information e.g. national definitions and reporting.

The competent authority and/or focal point could be established within such administrative mechanisms or bodies.

- (b) Scientific and technical mechanisms/bodies to:
 - (i) Provide technical assistance to stakeholders;
 - (ii) Interpret and apply the Convention with regards to waste terms, lists, and definitions;
 - (iii) Administer permits, licenses, and authorizations noted below and outlined in the Manual on Permits, Licenses or Authorizations;¹¹
 - (iv) Provide certification or accreditation as may be required under the national legislation; and
 - (v) Undertake periodic inspections of facilities pursuant to permitting, licensing and authorization procedures e.g. waste disposal facilities.
- (c) Legal mechanism/body to:
 - (i) Develop the legal basis and mandates for other mechanisms and/or bodies;
 - (ii) Promote compliance; and
 - (iii) Enforce the provisions of the Convention, relevant national measures and synergistic aspects related to the Convention, such as management of hazardous substances, including mercury.

This mechanism or body may also be given responsibility for providing recourse or redress.

26. The Party may wish to ensure adequate staff are available (e.g. within the Ministry of Environment, customs and enforcement officials) with sufficient resources and mandate to administer, implement and enforce the Basel Convention, its provisions on ESM and related implementing laws or other measures. The judiciary should include professionals well versed in the provisions of the Basel Convention and related legislation and other measures.

27. The Party may also wish to establish a mechanism to ensure coordination and cooperation between the relevant bodies involved in the implementation and enforcement of the Convention (e.g. a coordination committee involving representatives of concerned ministries).

B. Infrastructure

28. In addition to institutional arrangements and waste provisions, Parties should possess practical infrastructure on the ground in order to ensure ESM. This might include the following:

- (a) Adequate tools (e.g. financial resources, software/hardware, analytical capability) to administer, implement and enforce the Basel Convention and related implementing laws or other measures;
- (b) Adequate laboratory facilities and analytical capability for sampling and analysis;
- (c) Occupational safety and health (OSH) clinics and adequately trained industrial hygienists (expertise available at low cost);
- (d) Downstream residual management (e.g. waste treatment centres for POPs wastes, heavy metals waste, other hazardous waste and sanitary landfills, etc.).

¹¹ See appendix III of this document.

V. Transboundary movement control system

29. The Basel Convention establishes a control system that governs transboundary movements (imports, exports and transit) of hazardous wastes and other wastes to ensure ESM of wastes under the scope of the Convention. Please see the Guide to the Control System¹² for further information and guidance.

VI. National level elements for ESM

30. The link between ESM and national legislation has been underlined within various documents.¹³ In addition to the establishment of a legal and policy framework, and the practical arrangements mentioned in sections IV and V above, below are a number of specific elements that should be in place through legislation and other measures to ensure ESM in accordance with the Basel Convention.

A. Waste strategy and management policies and plans, including waste prevention and minimization

31. A Party should promote waste prevention and minimization. Please consult the Manual on Waste Prevention.¹⁴

32. A Party should develop and implement national/domestic waste strategy and management policies and/or plan(s) that are consistent with the Convention and include the elements necessary to implement ESM. These strategies, policies and plans could be associated with the development and implementation of legislation. The strategy and plan should be periodically reviewed to keep up to date with relevant advances in environmentally sound technologies and management practices.

B. Waste generators

33. Policies and legislation should provide for waste generators to internalize costs associated with their production processes and policies, including through the following:¹⁵

- (a) Cleaner or greener design and production by implementing industrial conversion processes where feasible;
- (b) Waste prevention and minimization;
- (c) Prior to production, research, design and innovation in production and delivery of services, especially impact assessment at end of life, and integrated design for reuse, repair, disassembling (when appropriate), recovery and recycling;
- (d) Assurance that waste disposal facilities and carriers comply with applicable legislation and hold corresponding permits, licenses or authorizations, as appropriate;
- (e) A requirement for confirmation from waste disposal facilities that wastes have been managed in an environmentally sound manner;
- (f) Disclosure of information on generation and disposal, including storage, of wastes and information related to the use of hazardous chemicals and substances, their use in products and wastes, their risks and their management inside and outside the facility;
- (g) As appropriate, a voluntary third-party environmental certification procedure, which may include an applicable EMS;
- (h) An understanding of proper implementation of and compliance with the Basel Convention for transboundary movements of wastes.

34. Please consult part VI, section B of the ESM Framework.¹⁶

¹² Guide to the control system: Instruction manual for use by those persons involved in transboundary movements of hazardous wastes (available in document UNEP/CHW.12/9/Add.3/Rev.1 (annex)).

¹³ See e.g. Objective 2.1 of the Strategic framework for the implementation of the Basel Convention for 2012–2021 (available in document UNEP/CHW.10/3 (annex)).

¹⁴ See appendix V of this document.

¹⁵ Further elaborated in part VI, section B, sub-section 1 of the ESM Framework (available in document UNEP/CHW.11/3/Add.1/Rev.1 (annex)).

C. Waste carriers

35. A carrier is any person who carries out the transport of hazardous wastes or other wastes.¹⁷ This includes those considered as “transporters” and “shippers”. This manual focuses on off-site transportation falling within the scope of the Basel Convention. Off-site transportation of waste includes shipments from a waste generator’s property to another location for disposal. Regulated off-site transportation includes shipments of hazardous waste by air, rail, highway, or water. Carrier regulations only apply to the off-site transportation of wastes.

36. A waste carrier should comply with the requirements associated with the national legislation and other measures implementing the Basel Convention, which should include the information to be provided in the movement document, required in accordance with annex VB of the Basel Convention and decision VIII/18.¹⁸

37. Carriers accepting waste from a generator or another transporter may need to store waste temporarily during the normal course of transportation. A transfer facility may include loading docks, parking areas, storage areas, and other similar areas where shipments are held during the normal course of transportation. A time-limit should be stipulated in regulations in terms of the amount of time a transporter may hold waste at a transfer facility.

D. Waste disposal

38. To complement and enhance the permitting, licensing or authorization process(es), legislation and other measures should include requirements to ensure waste management facilities or services possess plans to provide a holistic system to ensure that wastes are managed and disposed in a safe and environmentally sound manner.¹⁹

39. The following elements should be considered in developing legislation, regulations and other measures relating to the regulation of facilities and stakeholders involved in ESM of wastes:

(a) Capacity:

Waste management facilities should demonstrate through a permitting, licensing or authorization programme that they possess the technical ability and capacity to treat the waste streams identified as wastes falling under the scope of the Basel Convention in an environmentally sound manner. The facility should follow the best available techniques (BAT) and best environmental practices (BEP). Key control features include measures to contain, monitor and treat any emissions, discharges or releases and appropriate control devices;

(b) Health and safety plans:

Programmes should be in place to define the responsibilities of staff; ensure they are knowledgeable about good housekeeping practices; and that they receive training on the safe and environmentally sound operation of waste management facilities, with the provision of personal protection equipment, among other requirements;

(c) Emergency action plans:

(i) Programmes should be in place to implement emergency preparedness and response plans should an emergency occur on-site at the facility or off-site during transportation;

(ii) An action plan should be developed to respond to emergencies or accidents. The plan should locate and provide emergency equipment at pre-designated spots in the facility. This equipment should include fire extinguishers and personal protection equipment (e.g. special clothing, face masks and

¹⁶ Available in document UNEP/CHW.11/3/Add.1/Rev.1 (annex) and on the Basel Convention website at: <http://basel.int/Implementation/CountryLedInitiative/EnvironmentallySoundManagement/Overview/tabid/3615/Default.aspx>.

¹⁷ Article 2 of the Basel Convention defines the term “carrier”.

¹⁸ Revised notification and movement documents for the control of transboundary movements of hazardous wastes and instructions for completing these documents (available in document UNEP/CHW.8/5/Add.6/Rev.2 (annex I, annex II)).

¹⁹ Various technical guidelines have been developed under the Convention and are available on the Convention website at: <http://www.basel.int/Implementation/Publications/TechnicalGuidelines/tabid/2362/Default.aspx>.

- respirators, spill absorbents, shovels) as required by the process and materials at the facility. This should be accompanied by employee training on proper use of personal protection equipment and guidance for the response to and remediation of a spill;
- (iii) The plan should ensure prompt reduction of any adverse effects of an accident if one should occur. Training exercises should be carried out periodically to ensure readiness. Special handling requirements for the wastes managed on-site should be included; and
 - (iv) The plan should include a procedure for public outreach and for notification of unusual occurrences (e.g. emergencies, spills, releases to the environment);
- (d) Monitoring:
- (i) Waste generators should regularly inform the competent authority of the quantity and characteristics of hazardous wastes or other wastes generated, exported, imported and transiting through the territory in the previous year.²⁰ Further, the generator should regularly provide the competent authority with information on pertinent measures it has adopted relating to waste management as described above. Finally, the generator and other stakeholders if relevant should provide the competent authority with information on accidents which have occurred during the transboundary movement and disposal of hazardous wastes and other wastes and on the measures taken to deal with them; and
 - (ii) Monitoring provides a picture of a facility's environmental performance and indicates processing problems. A system should be in place to monitor the performance of the waste management operations, for both record-keeping purposes and to detect discharges, releases, and accidents, and to take appropriate action if performance does not comply with targets. Monitoring should be analyzed and reviewed at regular intervals to provide information for decisions needed to improve the process and reduce potential impacts on environmental and human health;
- (e) Record Keeping:
- Stakeholders involved in waste management activities should develop and put in place systems for record keeping in terms of how the management operation is performing, including reporting discharges; emissions; accidents causing damage; or the potential for causing damage to workers' safety, health and the environment;
- (f) Closure:
- There should be a plan in place in the event of shutdown or closure of a facility managing wastes. This includes a plan for remediation of buildings and land and for financial insurance or guarantee that a proper shutdown will happen in an environmentally sound manner. In order to demonstrate "clean closure", an owner or operator should demonstrate that levels of contamination from hazardous wastes and other wastes at the facility do not exceed exposure levels contained in a country's regulations;
- (g) Post-closure:
- (i) Post-closure care should be undertaken at facilities where final disposal of wastes occurs. This would address the period after closure during which owners and operators conduct monitoring and maintenance activities to preserve the integrity of the disposal system. The post-closure period normally lasts for 30 years after closure is completed, but can be extended or shortened by the designated authority; and
 - (ii) Post-closure care consists of two primary responsibilities: ground water monitoring and maintaining the waste containment system (e.g. covers, caps, and liners).

²⁰ In order to enable the Party to report in accordance with Article 13 of the Basel Convention.

E. Permits, licenses or authorization to operate

40. For more detailed information on permits, licenses and authorizations, please consult the Manual on Permits, Licenses or Authorization.²¹

F. Provisions for insurance

41. For more detailed information on insurance and liability, please consult the Manual on Insurance and Liability.²²

G. Waste classification

42. Legislation should provide guidance for waste classification, including appropriate reference to and consistency with annexes I, II, III, VIII, and IX of the Basel Convention to assist stakeholders, e.g. waste generators, in properly identifying and classifying their waste to ensure proper management at all stages of the waste management process. Under the Convention, there are various provisions for determining wastes covered by the control procedures of the Convention and particularly hazardous wastes.²³ Pursuant to national law, it is normally the duty of the exporter or any other person (e.g. generator) engaged in exporting the waste, to prove, if necessary, that the waste in question does not possess or exhibit any of the hazardous characteristics, so that the waste will not be subject to control under the Convention.

H. Waste storage

43. Requirements should be in place to ensure that waste is properly stored in such a manner as to protect human health and the environment.²⁴ Such requirements should provide for proper storage in containers, tanks, drip pads or containment buildings. Hazardous waste containers should be closed and marked with the date that the storage began.

I. Emergency preparedness and employee training

44. Facilities managing or handling wastes should designate one or more emergency coordinator(s) to test and maintain emergency equipment. An emergency plan should also be developed, put in place and updated as needed, with formal written contingency plans and emergency procedures in the event of a spill or release. Facility personnel should be trained in the proper handling of hazardous waste through an established training programme.

J. Pre-transport requirements

45. Pre-transport regulations should be in place to ensure safe and environmentally sound transportation of wastes being shipped off-site from the point of generation for treatment, storage, or disposal. If the hazardous waste is treated on-site, pre-transport regulations would not be applicable, although other regulations may apply outside the scope of this manual.

46. Pre-treatment provisions should require appropriate packaging and labelling. This includes proper packaging to prevent leakage of wastes, particularly hazardous wastes, during both normal transport conditions and potentially dangerous situations (for example, if a drum falls off of a truck). Labelling of the packaged waste is necessary to identify the characteristics and dangers associated with the transport of the hazardous waste.

K. Tracking provisions

47. Provisions should be included for tracking waste shipments and receipt of waste, taking into account the information to be provided on the notification according to annex VA and the movement document according to annex VB of the Basel Convention.

L. Record keeping

48. Legislation and other implementing measures should ensure that adequate record keeping and reporting requirements are in place for all stakeholders involved in waste management. This would

²¹ See appendix III of this document.

²² This manual is still under development by the expert working group on environmentally sound management.

²³ See section 2.2 of the Guide to the Control System (available in document UNEP/CHW.12/9/Add.3/Rev.1 (annex)).

²⁴ Various technical guidelines have been developed under the Convention and are available on the Convention website at: <http://www.basel.int/Implementation/Publications/TechnicalGuidelines/tabid/2362/Default.aspx>.

include transmitting relevant information to authorities, so as to facilitate transmission of information by the Party according to its national reporting obligations.

M. Public access to information

49. Parties should provide the public with appropriate access to information concerning ESM (e.g. government records on waste disposal facilities and waste transports, inspection records, notices of violations etc.).

N. Awareness raising and education

50. Access to information should be accompanied by active awareness raising and education. Parties have an important role to play in raising awareness of key issues concerning sustainable production and consumption in general, and ESM and TBM specifically. Awareness raising campaigns, targeting a specific part of the public, industry or society, are an example of awareness raising activities. Integrating training on ESM in school programmes is another example.

VII. Enforcement

51. Each Party has an obligation to take appropriate legal, administrative and other measures to implement and enforce the provisions of the Convention, including measures to prevent and punish conduct in contravention of the Convention.²⁵ National legislation should provide authority for enforcement bodies to impose administrative, civil and criminal sanctions. Penalties should be sufficient to serve as a deterrent. Provision should also be made to facilitate communication, coordination and cooperation between various national authorities that may have a role to play in implementing these provisions e.g. customs officials, competent authorities, prosecutors, environmental inspectorates, etc.

52. Additionally, as part of a Party's efforts in implementing the above obligations, national legislation should make provisions for take-back of illegal traffic of hazardous wastes and other wastes pursuant to Article 9 of the Convention.²⁶

VIII. National reporting of hazardous wastes and other wastes

53. Under the Basel Convention, all Parties are required to report annually through the Secretariat, by completing a questionnaire, information required by the Convention regarding transboundary movements of hazardous wastes or other wastes, among others. This information is presented in an annual national report, which includes statistical tables of the data.

54. All Parties should periodically carry out checks to ensure that available data transmitted in the national reports is of the highest quality.

55. Further information and guidance on national reporting is available on the Basel Convention website.²⁷

IX. Incentives

56. Please consult the document on private sector incentives.²⁸

²⁵ Article 4, paragraph 4 and Article 9 paragraph 5 of the Basel Convention. See also Guidance Elements for Detection, Prevention and Control of Illegal Traffic in Hazardous Waste available on the Convention website at: <http://www.basel.int/Implementation/Publications/GuidanceManuals/tabid/2364/Default.aspx>.

²⁶ See also the Guidance on the implementation of the Basel Convention illegal traffic take-back provision (adopted by the Conference of the Parties at its thirteenth meeting by decision BC-13/9 and available in document UNEP/CHW.13/9/Add.1/Rev.1).

²⁷ Further information available at:

<http://www.basel.int/Countries/NationalReporting/OverviewandMandate/tabid/2314/Default.aspx>.

²⁸ See Report on assessing possible incentives to encourage the private sector to invest in environmentally sound management (available on the Basel Convention website:

<http://www.basel.int/Implementation/CountryLedInitiative/EnvironmentallySoundManagement/ESMToolkit/PrivateSectorIncentives/tabid/5848/Default.aspx>

X. Additional information/References

Framework for the environmentally sound management of wastes

<http://basel.int/Implementation/CountryLedInitiative/EnvironmentallySoundManagement/Overview/tabid/3615/Default.aspx> Strategic framework for the implementation of the Basel Convention for 2012–2021

<http://www.basel.int/Implementation/StrategicFramework/Overview/tabid/3807/Default.aspx>

Rio declaration on environment and development (1992)

<http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm> Basel Convention manual for the implementation of the Convention (includes a checklist for the legislator)

UNEP/CHW.12/9/Add.4/Rev.1 (annex)

Basel Convention revised guide to the control system: Instruction manual for use by those persons involved in transboundary movements of hazardous wastes

UNEP/CHW.12/9/Add.3/Rev.1 (annex)

Guidance elements for detection, prevention and control of illegal traffic in hazardous waste

<http://www.basel.int/Implementation/LegalMatters/IllegalTraffic/Guidance/tabid/3423/Default.aspx>

Guidance on the implementation of the Basel Convention illegal traffic take-back provision

UNEP/CHW.13/9/Add.1/Rev.1

Instruction manual on the prosecution of illegal traffic of hazardous wastes or other wastes

<http://www.basel.int/Implementation/LegalMatters/IllegalTraffic/Guidance/tabid/3423/Default.aspx>

Basel Convention training manual on illegal traffic for customs and enforcement agencies

<http://www.basel.int/Implementation/LegalMatters/IllegalTraffic/Guidance/tabid/3423/Default.aspx>

Appendix III

Permits, Licenses or Authorizations

Basel
Convention

I. Introduction

1. The permitting, licensing or authorization of installations and activities by designated authorities is essential for ensuring the environmentally sound management (ESM) of hazardous waste and other waste. This manual provides information on procedures and requirements associated with permits, licenses and authorizations.
2. This manual provides a general overview of how to establish procedures and requirements for facilities to obtain permits, licenses or authorizations to conduct waste management activities. Most important is the incorporation of these general rules into national legislation, and their practical implementation to ensure ESM. Only when adequate waste management practices are promoted can the necessary investments be made by facilities and other stakeholders to bring about environmentally sound waste management practices. Therefore, it is of the greatest importance to enable the main actors to access the necessary information: this manual provides an overview of the necessary information with some references.

II. Permits, licenses or authorization procedures

3. Waste management activities, sites and facilities should hold a permit, license, or other authorization (e.g. information provision, registration, as appropriate).
4. National, regional, or state legislation should clearly state the process by which facilities can obtain a permit, license or other authorization and the designated authorities to contact.
5. Waste management facilities may only operate if the operator holds a permit, license, or other authorization containing requirements and conditions and is in compliance with these requirements for the protection of the environment, as well as to avoid adverse effect on human health. Waste management facilities should adhere to provisions regarding the waste management hierarchy (prevention, minimization, reuse, recycling, other recovery including energy recovery and final disposal), transportation, storage, accident prevention, site clean-up, and any other matters as specified in the permit, license or authorization.
6. Because of the connection between different permits, licenses or authorizations (e.g. for buildings, water discharge, or environmental protection in general), such procedures should be fully coordinated, and start with preliminary discussions with the operator before commencing the “official” permitting, licensing or authorization procedure according to legislation.
7. Costs for the application and approval procedure and monitoring by designated authorities can be covered by a fee payable by the operators of the permitted, licensed or authorized activity.

A. Planning

8. Ideally, the first stage of the permitting, licensing or authorization process begins with planning as follows:
 - (a) Designated authorities should be subjected to an obligation to develop a strategy and plan of the national/regional/local waste management infrastructure according to the needs of capacities (waste management plan) and in the course of spatial planning (including land use, urban, regional, transport and environmental planning, etc.).¹ This plan should be updated regularly, taking into account the evolution of the amounts and types of waste generated, the availability of waste management technologies, the implemented legislation and other policy related measures;
 - (b) The operators of waste management facilities and services should plan their activities prior to applying for a permit, license or authorization;
 - (c) The designated authority should be informed by the operator at a very early stage of its planning activities to ensure a timely and efficient permitting, licensing or authorization procedure;
 - (d) The designated authority should make an assessment of appropriate action to be taken in case of non-compliance of a facility’s operations.

B. Application

9. The permit, license or authorization should be issued to legal person(s) registered within the provisions of the relevant national, regional, or state legislation;

¹ Proper positioning and planning of the facility should be assessed by superimposing the spatial location on other maps such as road, rail, water supply, residences, community services, etc.

10. The person(s) applying for a permit, license or authorization should submit an application including the following:

- (a) Name of the company, registered office, management address;
- (b) Location of the planned waste management site or facility/service;
- (c) Type (e.g. Basel code and name), quantity and origin of waste to be accepted and managed;
- (d) Type of waste management activities/operations for which the application is submitted;
- (e) Methods and technologies that will be applied (BAT/BEP should be considered, as appropriate);
- (f) Downstream waste management of residual wastes;
- (g) Maximum capacity of the installations;
- (h) The proposed technology and other techniques for preventing or, where this is not possible, reducing discharges/emissions/releases from the installation into each medium (air/soil/water);
- (i) Indication of discharges/emissions/releases and resulting waste streams (type, description, quantities and destinations) to be expected;
- (j) Measures planned to monitor discharges/emissions/releases into the environment;
- (k) Safety and precautionary measures that will be taken as appropriate (and specification as to what these measures would address);
- (l) Specific competencies and skills of employees;
- (m) Measures and technologies for closure and after-care operations at waste management sites;²
- (n) Adequate and appropriate contingency³ and emergency plans;
- (o) A report of an environmental impact assessment (EIA), if required;
- (p) A detailed waste management plan, if required, including a description of:
 - (i) The waste management operation(s) or service(s) that will be carried out, including how wastes will be stored;
 - (ii) Sufficient measures to safeguard occupational safety and health (OSH);
 - (iii) (Appropriate and adequate) contingency and emergency plans;
 - (iv) Training programme for personnel;
 - (v) Monitoring and reporting programme;
 - (vi) Plan for closure and after-care;
 - (vii) Financial insurance or guarantees for liabilities resulting from accidents, emergency spills, environmental damages and/or clean-up, closure and after-care;
 - (viii) Other information according to the requirements of national, regional or state legislation.

11. The application should be submitted to the designated authority in the appropriate format according to the national, regional or state legislation.

² The need for closure plans and financial insurance or guarantees is determined by applicable laws and regulations, taking into consideration the level of risk. Closure plans should be updated periodically and financial insurance or guarantees should ensure that necessary measures are undertaken upon cessation of activities to prevent any environmental damage and to return the site of operation to a satisfactory state, as required by the applicable laws and regulations.

³ For example, appropriate action to be taken in case of exceeding emission limits arising from the facility's operations.

C. Approval process

12. The designated authority should, among other things:

- (a) Set time limits for each stage of the application and approvals procedure. Time limits will lead to reduced costs for applicants and ensure designated authorities are accountable and efficient;
- (b) Decide whether the application and its accompanying documentation complies with regulatory requirements, including the environmental impact assessment (EIA) and an assessment of the implementation of BAT/BEP, if required by national, regional or state legislation;
- (c) Inspect the site and discuss details with the applying person(s);
- (d) Consult with other relevant authorities, and the public, if required, in order to gather facts and opinions that would contribute to the assessment of the application;
- (e) If necessary ask the applicant to provide additional relevant information and/or undertake actions in order to comply with national, regional or state legislation to issue the permit, license or authorization for the particular waste management activity;
- (f) Issue or refuse to issue the permit, license or authorization in accordance with national, regional or state requirements;
- (g) If appropriate, lay down specific conditions for carrying out waste-related operations;
- (h) Have a process in place to involve the public for example through public meetings, public review and commenting periods on the application for a permit, license or authorization.

D. Change/cancellation/termination of permits, licenses or authorizations

13. A permit, license or authorization can be changed, cancelled or terminated as follows:

- (a) It can be amended or supplemented as deemed necessary by the designated authority;
- (b) It can be amended or supplemented upon request of the permit, license or authorization holder;
- (c) The operator should inform the designated authority of any planned change in the nature or functioning, or an extension of the installation that may have consequences for the environment. Where appropriate, the designated authority should update the permit, license or authorization;
- (d) Substantial changes of an installation, waste management facility or service, should result in prior updating of the permit, license or authorization. In this case the operator should apply for an amendment to the permit, license or authorization;
- (e) The permitted, licensed or authorized operations should be terminated, for example:
 - (i) After the expiration date of the permit, license or authorization (if no renewal is sought);
 - (ii) If violations are not addressed;
 - (iii) If the permit, license or authorization holder requests a termination.

III. Requirements

14. This section provides examples of requirements that are generally addressed with respect to the ESM of waste. Many countries take different approaches to establishing requirements in order to determine what may constitute ESM of waste.

A. Environmental requirements

15. Environmental requirements may include the following:

- (a) Air emissions from thermal processing:
 - (i) Thresholds for: CO₂, SO_x, NO_x, fine dust, HCl, HF, dioxins and furans, gaseous and vaporous organic substances, expressed as total organic carbon (TOC), and heavy metals such as mercury, lead, arsenic, chromium;

Note: Dioxins are produced in small concentrations when organic material is burned in the presence of chlorine. Furans are also usually produced from thermal processes.

- (ii) Quantities and maximum concentration of contaminants in the ashes;
- (b) Waste water:
 - (i) Categorizing of discharged water/fluids and receiving medium (water body, sewer, water treatment plant);
 - (ii) Thresholds for: Biochemical oxygen demand (BOD), chemical oxygen demand (COD), mercury, cadmium, arsenic, lead, chromium, copper, nickel, zinc, cobalt;
 - (iii) Conditions for waste water from flue gas cleaning;
 - (iv) Thresholds of contaminants in the discharges/effluent (from waste water treatment) and in the ashes and slags (from thermal treatment) for final disposal;
- (c) Other (odour, light, noise etc.):

Requirements for minimum standards of odour, light and noise;
- (d) Landfill sites:

Quantities and concentration of contaminants in the ashes and slag due for final disposal in landfill.

B. Occupational safety and health requirements

16. Occupational safety and health (OSH) requirements may include the following:

- (a) Hygiene and nuisance control;
- (b) Sufficient measures to safeguard OSH:

Workers at waste management facilities or services should not be exposed to unacceptable OSH risks related to the content of the materials they are handling or discharges/emissions/releases from those materials and the equipment being used. The waste may include hazardous chemicals or toxic metals; it may generate discharges/emissions or release harmful dust. Workers may have to handle heavy loads, and be exposed to vibrations and the noise of machinery. Also, the risk of fire and explosion may exist in some cases. Consequently, adequate measures should be taken to avoid unacceptable OSH risks. Adequate measures should be established by national, regional or state legislation, in the authorization of facilities or by voluntary agreements;

- (c) Facilitate periodic medical examination for employees;
- (d) Facilitate periodic training of employees of waste facilities:

Personnel involved in the management of waste and materials, in particular hazardous waste and materials, should be capable and adequately trained to identify and properly handle the materials, operate equipment and follow processes, eliminate risk situations, control releases and carry out safety and emergency procedures;

- (e) Sufficient measures to ensure that children are not present within the grounds of the waste facility;
- (f) Auditing committees should be established for different OSH and environmental issues.

17. In addition, the operators of the waste management facility should ensure protection of the communities surrounding the hazardous waste facility from air pollutants, wastewater discharges, groundwater pollution, noise, etc. during operation of the facility. There should also be a well-maintained follow-up programme by the designated authority as ensuring the health and safety of surrounding communities is often not part of the direct legal obligations of the owner or operator of the waste facility. Measures should be taken to prevent access by children to hazardous areas of a waste facility both during active operation and following closure of the facility.

IV. Monitoring and control

18. The facility should have a regularly updated plan for monitoring, reporting and responding to accidental or otherwise exceptional discharges/emissions/releases.

A. Monitoring

19. The facility should have standardized sampling and testing methods in order to facilitate the monitoring of its operations.

20. The facility should have a monitoring and reporting programme that covers:

- (a) Relevant legal requirements;
- (b) Compliance with applicable safety requirements;
- (c) Groundwater quality, discharges and emissions, as well as other requirements established (relating to soil, noise, odour, etc.);
- (d) Incoming, stored and outgoing waste, in particular for hazardous waste;
- (e) Type and amount of wastes disposed of and disposal methods employed;
- (f) Record keeping for a specified time.

B. Appropriate and adequate emergency plan

21. This plan should include emergencies such as accidents, fires, explosions, abnormal operating conditions, etc. The emergency plan should be based on the evaluation of existing and potential risks. This plan should be regularly tested and revised as appropriate, in particular after the occurrence of accidents or emergency situations.

C. Records and reports

22. There should be an obligation to provide information and reports which cover the requirements listed in section A on monitoring above: waste management facilities and services should maintain records on the generation, collection, transport or disposal of waste, its type and amounts. These records are to be made available to the designated authorities upon request for a specified time period.

D. Control

23. On a periodic basis, in accordance with national, regional or state legislation, designated authorities should inspect the facility(ies) or services for which the permit, license or authorization has been issued to verify compliance of the conditions for waste management with those stated in the permit, license or authorization issued and compliance with the requirements of the legislation.

24. Follow-up actions in case of non-compliance should be developed and documented. For example, measures that may be taken include the issuance of fines, temporary closure and other judicial and administrative penalties.

Appendix IV

Certification Schemes

Basel
Convention

I. Introduction

1. In recent years, voluntary standards that set out environmental performance criteria, often developed by private sector stakeholders, NGOs and standardization bodies, that may include government involvement, have become a tool in which industry can demonstrate their commitment to best industry practices to policymakers, regulators, customers and the general public. Sometimes governments may choose to make such standards mandatory through legislation.
2. Certification is a means to determine conformity with a standard and to recognize and reward those that adhere to such standards. Certification programmes typically rely on independent, third-party auditing – e.g. by an accreditation body – to verify conformity to a standard. Under the Basel Convention, such certification schemes have been recognized as a potentially valuable tool for promoting or facilitating the implementation of environmentally sound management (ESM) at the facility level.¹
3. This manual provides guidance to policymakers, regulators, facility managers, consumers and the general public on how standards and certifications can help implement ESM globally. The topics of the manual include:
 - (a) How to use standards and certification to support the implementation of ESM;
 - (b) Environmental performance standards for waste management and for the support of ESM;
 - (c) Quality assurance of standards associated with waste management and for the support of ESM;
 - (d) Examples of standards that could address waste management and support/promote ESM.

II. Standards and certification for the support and promotion of ESM implementation

A. How to use standards and certification to support the implementation of ESM

1. At facility level

4. Voluntary schemes provide a tool for facilities and services to demonstrate their commitment to best industry practices to customers and thereby provide market advantages to the facility. Such schemes can allow for the gradual adoption by the sector, allowing the system to develop and improve over time. There may be a financial advantage or benefit for companies that decide to implement the standard before being required to do so. A clear example is in the United States (US) electronics recycling market where certification for companies is not required but customer demand, among other reasons, has promoted rapid growth in the use of voluntary standards (or environmental performance standards). Since 2010, over 530 US electronics recycling facilities have been certified to accredited standards, which cover, by volume, the vast majority of the US market.²
5. Facilities and services are required to comply with all applicable legal requirements for waste management, including national, regional and state requirements. Some governments may allow companies to use standards and certifications as an option or tool to demonstrate regulatory compliance.
6. Auditors can determine and verify a facility's conformance to the environmental performance or waste management standard in support of ESM. Thorough audits are typically performed periodically (i.e. every three years). Unannounced, annual spot checks can also help to improve conformity.
7. In general, standards and certification schemes benefit the environment and public health, but they also give rise to benefits for corporations which implement them. These include, but are not limited to:

¹ Framework for the environmentally sound management of hazardous wastes and other waste (ESM Framework) (available in document UNEP/CHW.11/3/Add.1/Rev.1 (annex)).

² Data provided by the Institute of Scrap Recycling Industries Inc. (ISRI).

- (a) Enhanced compliance with legal requirements:
 - (i) Certification provides mechanisms and management systems to ensure compliance with all relevant legal requirements;
 - (ii) Enhanced compliance with international, regional and national requirements on transboundary movements of waste can reduce cases of illegal traffic;
- (b) Reduction of liabilities:
 - (i) Certification and audits can help to bring market players into compliance with standards and thereby promote ESM;
 - (ii) Reduced chemical exposure, less risk of spills and releases, and reduced environmental and public health risks associated with waste management may reduce insurance premiums;
- (c) Economic benefits derived from increased plant efficiency:

Raw material savings; reduction in chemical use; prevention and minimization in waste stream generation; prevention and minimization in waste disposal costs; reduction in costs associated with hazardous waste disposal liability, including banking and insurance charges; more efficient and streamlined waste reporting and tracking, and raw material and waste handling. Some facilities and services reference an operational cost reduction of 10% on average after implementing a quality and environmental management system;³
- (d) Trade benefits:

Enhanced communication throughout the supply chain and amongst governments facilitates a more efficient and profitable flow of materials;
- (e) Improved safety:

Improved employee safety leading to better morale and productivity and improved community safety through reduced environmental and public health risks in a facility's local setting;
- (f) Improved relationships with regulators and the public:

Recognition by regulators and the public of a facility's commitment to conducting its business in a manner exceeding regulatory requirements in its main area of focus as well as in worker safety, and protecting human health and the environment through its day-to-day business activities;
- (g) Improved business relationships:

Recognition by partners in the supply chain of the facility's commitment to ESM of materials and wastes, and its reliability as a high quality source of services and supplies;
- (h) Protection of stockholders and stakeholder interests:

Protection of facility investments and ongoing business value from reduced/eliminated costs of upsets (non-compliance fines and/or costs from clean-up from accidents or emergencies) and liabilities;
- (i) Competitive advantage in the market place:

Certified companies attract more market share as customers seek responsible actors.

2. At governmental level

8. Environmental performance standards and certification schemes that address waste management and/or which promote ESM can be used in a number of ways. Governments may choose to utilize voluntary certification and auditing schemes in support of certain standards as a compliance tool at the facility level.⁴ Environmental performance standards addressing waste management or other specific key elements of ESM can be implemented voluntarily, allowing the private sector to provide oversight with accreditation and certification bodies and independent auditors. Governments

³ Data provided by the Institute of Scrap Recycling Industries Inc. (ISRI).

⁴ ESM Framework (available in document UNEP/CHW.11/3/Add.1/Rev.1 (annex)).

may choose to utilize certification schemes as a compliance tool but need to ensure that their requirements are consistent with existing legal obligations international trade and waste management related regulations. However, many governments, particularly in industrialized countries, still rely on prescriptive legislation to ensure ESM at the facility level and, to date, do not require voluntary standards or certification. Depending of the nature of the sector, governments can choose to wait until such standards are sufficiently embraced in a specific sector before legally requiring them.

9. There is no “one size fits all” solution. Policymakers need to weigh the use of standards and certification with the needs of their particular country and region. In addition, policymakers may need to consider the individual needs of small and medium-sized enterprises (SMEs) with regard to the use of standards and certifications because of cost or feasibility. Governments may consider subsidizing the costs of certification in order for SMEs to achieve ESM at a low cost or may consider making certain allowances for SMEs to be able to confirm their adherence to certain elements of ESM without going through a potentially costly certification.

10. Appropriate hazardous waste and other waste management laws, emergency response capabilities, and general infrastructure may need to be considered to evaluate overall ESM in a country.

B. Environmental performance standards for waste management and for the support of ESM

11. Facility based standards that seek to confirm compliance with waste management requirements can demonstrate ESM and should include the following key performance elements:

- (a) Top management commitment to a systematic approach:
Demonstrate commitment of top management to integrate a systematic approach to achieve ESM in all aspects of facility operations, which often includes an environmental health and safety management system;
- (b) Environmental health and safety management system:
Utilize an environmental health and safety management system to plan and monitor the facility’s environmental, health, and safety practices. Facilities and services may choose to have the system separately certified to an accredited management system standard;⁵
- (c) Adherence to waste management hierarchy (prevention, minimization, reuse, recycling, other recovery including energy recovery, and final disposal):
Written policies and procedures to manage waste based on the waste management hierarchy should be included;
- (d) Confirm compliance with legal requirements associated with waste management:
Identify, assess and confirm fulfilment of applicable legal requirements, including but not limited to: legislation and regulations; decrees and directives; permits, licenses, or other forms of authorization, as for example certificates of approval; orders issued by regulatory agencies; and/or judgments of courts or administrative tribunals, including discharges and emissions to air;
- (e) Implementation of non-waste related policies and/or technical guidance:
Facilities and services should also take into consideration other applicable policies, such as customary or indigenous law and treaties, protocols, Basel Convention technical guidelines, and BAT/BEP;⁶

⁵ In the event that domestic environmental management systems (EMS) are employed as part of a national approach to ESM, special consideration should be given to provide specifically tailored EMS systems for SMEs. Whichever EMS system will be selected, it is recommended that the government or large companies have a programme in place to provide support for SMEs in terms of information and know-how sharing.

⁶ For example, BAT and BEP guidance available on the Stockholm Convention website at: <http://chm.pops.int/Implementation/BATBEP/Guidelines/tabid/187/Default.aspx>; and EU reference documents available at: <http://eippcb.jrc.ec.europa.eu/reference/>. See also OECD Guidance Manual on Environmentally Sound Management of Wastes providing further information and available at: <http://www.oecd.org/env/waste/39559085.pdf>.

- (f) On-site environment, health and safety controls:
Contain facility practices and controls to protect worker and public health and safety and the environment under both normal and reasonably foreseeable circumstances (including accidents or emergency response);
- (g) Risk assessment, prevention and minimization:
Address whether the facility has identified all actual and/or potential hazards and risks to public and worker health and safety, and the environment, that are associated with activities, products and services. Eliminate risks where possible, and in all cases strive to prevent and minimize actual and/or potential hazards and risks to public and worker health and safety, and the environment, that are associated with activities, products and services;
- (h) Monitoring, recording and reporting programme:
Confirm that facility maintains records, monitors, tracks and evaluates its performance as appropriate for waste types and quantities managed;
- (i) Insurance, closure plan and financial responsibility:
Confirm that the facility has adequate insurance provisions to cover the potential risks and liabilities associated with the nature and size of the facility's operations, as well as adequate legal and financial assurances for the proper closure of the facility;
- (j) Awareness, competency and training:
Ensure employees have an appropriate level of awareness, competency and training with respect to the effective management of occupational risks;
- (k) Corrective action:
Take appropriate action to address significant actual and/or potential risks to public and worker health and safety, and the environment and correct identified deficiencies in achieving ESM;
- (l) Transparency and verification:
Provisions to support transparency and verification throughout each of the above building blocks, subject to appropriate protection for confidential business information, which can help facilities and services to provide public assurances that operations and activities are compatible with ESM. Such provisions may include for example participating in third-party audits and inspections;
- (m) Downstream due diligence:
A demonstrated commitment, that a facility takes all practicable steps to avoid harm to other persons or their property within their downstream material flow should be provided. This can include, to the extent feasible, assurances that transboundary movements of hazardous waste and other waste are limited to facilities and services that are authorized to dispose of such waste in an environmental sound manner.

C. Quality assurance of standards associated with waste management and for the support of ESM

1. Evaluation/Verification

12. Standards are only as good as their evaluation. Standards can be *first-party verified* (self-certified), *second-party verified*, where the certified company hires an audit firm to verify conformity with the standard, or *third-party verified*, by independent certification bodies that are accredited to certify to a standard by formal accreditation bodies. Although self-certification can be a beneficial approach, third-party verification may be better at ensuring conformity with the standard and send a stronger message of assurance to all stakeholders.

2. Accreditation, certification and auditing

13. Conformance with standards meant to support ESM can be verified or formally accredited by accreditation bodies. Accreditation is the independent evaluation of conformity assessment bodies

(certification bodies) against standards to ensure their impartiality and competence. Accreditation bodies provide necessary oversight and quality assurance over certification bodies.⁷

14. Certification bodies should operate in a non-discriminatory manner so as not to impede or inhibit access by applicants. They utilize trained auditors to ensure conformity to the standard and are responsible for granting certifications and provide a publically available list of certified organizations.

15. A third-party, independent audit can be critical to ensure conformity with the selected standard throughout a facility. Performance standards addressing waste management that rely on continual improvement in the facility's practice allow auditors to work with facilities to conform to the requirements of the standard, especially if there is an issue of non-conformity that needs to be addressed. Thorough facility audits are typically performed every three years. Unannounced, annual spot checks can also help to ensure conformity.

3. General elements supporting ESM

16. Although all standards are not identical, standards utilized to help facilitate, promote or otherwise support facility level implementation of ESM should contain similar key elements. As there are unique differences between waste streams, standards designed to manage specific waste streams should account for any unique detail not covered in a general environmental performance standard. Therefore, it may be important to include specific waste management elements, norms, or any other factors for guiding the appropriate management of these specific wastes.

D. Examples of standards that could address waste management and support/promote ESM

17. The following examples are not specifically applicable to waste management but include elements that can be adapted to ensure the environmentally sound management of wastes.

1. Management system standards⁸

(a) ISO 14001

18. ISO 14001, first released in 1996 and last revised in 2015, is a generic environmental management system (EMS) standard developed for any type of organization, large or small, and within any business sector.⁹ The standard is based on a continual improvement and regulatory compliance model designed to help organizations: (1) minimize how their operations (processes, etc.) negatively affect the environment (i.e. adverse effects to air, water, or land); (2) comply with applicable laws, regulations, and other environmentally-oriented requirements, and (3) continually improve on the above.

19. ISO 14001 may be used for third-party certification. As of 2013, at least 301,647 certificates in 171 countries have been issued, with an increase of 6% with respect to the previous year.¹⁰

20. This international standard has been revised in 2015 to be aligned to a high level structure for all management systems standards. The new version of 2015 incorporates some updated concepts to the previous standard such as life-cycle thinking, community involvement, risk assessment and will give greater importance to the governance and interested parties of the organization, among others.

(b) EU Eco-Management and Audit Scheme (EMAS)

21. EMAS is a management instrument developed by the European Commission for companies and other organizations to evaluate, report, and improve their environmental performance.¹¹ EMAS is open to every type of organization eager to improve its environmental performance. It spans all economic and service sectors and is applicable worldwide. The requirements of ISO 14001 are an integral part of EMAS. EMAS's requirements are more demanding than ISO 14001 concerning performance improvement, legal compliance and reporting duties.

⁷ Lists of International Accreditation Forum members are available at: www.iaf.nu/

⁸ The ESM framework sets out guiding principles (part IV and annex I) and strategies to implement ESM (part V, section C). The framework further contains references to a number of standards and certification schemes (annex II) (available in document UNEP/CHW.11/3/Add.1/Rev.1).

⁹ Further information on the ISO 14001 standard is available at:

http://www.iso.org/iso/home/standards/management-standards/iso14000/iso14001_revision.htm?= ; and <https://committee.iso.org/sites/tc207sc1/home/projects/published/iso-14001---environmental-manage.html>.

¹⁰ ISO Survey of Management System Standard Certification of 2014 available at:

http://www.iso.org/iso/iso_survey_executive-summary.pdf.

¹¹ Further information on EMAS is available at: http://ec.europa.eu/environment/emas/index_en.htm.

22. Currently, more than 4,500 organizations and approximately 8,150 sites are EMAS-registered worldwide. Among them are many multinational enterprises and smaller companies as well as public authorities.

(c) **Recycling Industry Operating Standard (RIOS™)**

23. RIOS is the recycling industry's management system standard for quality, environment and health and safety. Specifically designed for the recycling industry, RIOS integrates the key operational elements found in other standards, such as ISO 9001 (quality), ISO 14001 (environment), and OHSAS 18001 (health and safety), bringing them together into one streamlined management system. There are currently 101 facilities certified to RIOS. RIOS is accredited by ANAB (ANSI-ASQ National Accreditation Board) and requires an independent, third-party audit in order to obtain certification.

2. **Voluntary accredited environmental performance standards addressing specific waste/material streams**

24. Below are several examples of accredited standards that incorporate the key elements of ESM for the target waste stream. These standards can help a facility, located anywhere in the world, to demonstrate conformity to key elements of ESM.

(a) **R2:2013, Responsible Recycling (R2)™**

25. The Responsible Recycling (R2) Standard for Electronics Recyclers is a set of specifically designed guidelines for use by electronics recyclers to promote better environmental, health and safety, and security practices when recycling waste electronics. There are currently 521 facilities in 14 countries that are certified to R2. This standard is accredited by ANAB (ANSI-ASQ National Accreditation Board) and requires an independent, third-party audit to demonstrate conformity in order to be granted a certification.

(b) **Electronics Product Stewardship Canada (EPSC) Recycling Standard**

26. All electronics recyclers seeking to operate under the industry-funded Electronics Product Recycling Association (EPRA) programmes in Canada must be audited and approved by the Recycler Qualification Office to meet the requirements of the EPSC Electronics Recycling Standard (ERS). Certification to the internationally recognized Sustainable Electronics Recycling International (SERI) Responsible Recycling (R2) Standard for electronics recyclers is a prerequisite to the EPSC Electronic Recycling Standard, in addition to compliance with other Canadian-specific requirements. SERI's R2 Standard ensures accreditation through a third party certification body. EPRA's Recycler Qualification Office (www.rqp.ca) maintains a list of approved recyclers that are permitted to receive EPRA material. Electronic Products Recycling Association is the industry-led, not-for-profit organization that operates regulated recycling programmes across Canada to ensure that waste electronics are disposed of in a safe, secure and environmentally sound manner.

(c) **e-Stewards®**

27. The e-Stewards standard is for use by organizations that perform electronics recycling, processing, asset management, and refurbishment operations. The standard incorporates Basel Convention definitions and requirements, including the Basel Ban Amendment and also requires companies to be certified to ISO 14001. The e-Stewards standard requires an entire company and all of its facilities to be certified, and not just individual facilities.

28. This standard is an example of where NGOs and non-state actors support the use of voluntary environmental performance standards by participating in or contributing to their development and helping to maintain the quality through assistance with implementation at the facility level.

(d) **WEEELABEX**

29. WEEELABEX (Waste Electrical and Electronic Label of Excellence) standards were developed by the WEEE Forum in cooperation with stakeholders from the producers' community and processing industry and were introduced in April 2011. They include standards on collection, logistics and treatment of WEEE and monitoring procedures to guarantee harmonized conformity verification in EU and European Free Trade Association (EFTA) member states. They are in line with the legislative requirements of the EU directive on WEEE.¹²

¹² Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE) available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32012L0019>.

30. The standards require a management system to be in place for environment, health and safety purposes and which addresses the requirements for all treatment operations, including preparing for reuse, handling, sorting, storage and treatment of WEEE (including the full treatment of hazardous fractions). In the development of the standards, the BAT for waste treatment and recycling developed in Best Available Techniques Reference (BREFs) documents have been taken into consideration. The standards further include requirements concerning specific types of WEEE such as temperature exchange equipment, cathode ray tubes (CRTs) display appliances, flat panel displays, lamps and others.

31. The audits of “conformity verification” are conducted by auditors trained by the WEEELABEX Organization which was created to help with the implementation of these standards across Europe. The WEEELABEX Organization requires third-party verification of conformity (and not certification). Second-party verification is also allowed but only for a transition period. Facilities verified under the standard are identifiable through a visual identifier (or mark or quality label) issued by the WEEELABEX Organization.

(e) European standards for the treatment of WEEE

32. In application of the EU directive on WEEE (2012/19/EU), the European Commission mandated the European Standardisation Organizations (ESO), to develop standards for the treatment (including recovery, recycling and preparing for reuse) of WEEE.¹³ These standards are being developed by the European Committee for Electrotechnical Standardization (CENELEC), within its Committee CLC/TC111X (Environment) Working Group 6.

33. In executing this mandate, in March 2014 CENELEC published the standard EN 50625-1 (Collection, logistics and treatment requirements for WEEE - Part 1: General treatment requirements). This standard contains general requirements applicable to the treatment of all types WEEE. These general requirements will be supported by other standards covering particular treatment requirements for lamps, flat panel displays, CRTs, photovoltaic panels and other equipment containing volatile fluorocarbons or volatile hydrocarbons. In particular the standards to be developed are the following:

(a) EN 50625-2-1: Collection, logistics & treatment requirements for WEEE - Part 2-1: Treatment requirements for lamps;

(b) EN 50625-2-2: Collection, logistics & treatment requirements for WEEE - Part 2-2: Treatment requirements for WEEE containing CRTs and flat panel displays;

(c) EN 50625-2-3: Collection, logistics & treatment requirements for WEEE - Part 2-3: Treatment requirements for WEEE containing volatile fluorocarbons or volatile hydrocarbons;

(d) EN 50625-2-4: Collection, logistics & treatment requirements for WEEE - Part 2-4: Treatment requirements for photovoltaic panels.

34. Under the standards, treatment facilities have to be certified by an accredited conformity assessment body following an audit. The conformity assessment body shall be accredited by a European accreditation body in accordance with EU Regulation (EC) No 765/2008. Certified facilities hold a certificate of conformity to specific standard(s).

¹³ EC DG ENV, Mandate to the European Standardisation Organisations for standardisation in the field of WEEE (Directive 2012/19/EU (WEEE)), 24 January 2013, Ref. M/518 EN, available at: <http://ec.europa.eu/environment/waste/weee/pdf/m518%20EN.pdf>

III. Additional information/References

Accredited management system standards:

ISO Standards

www.iso.org/iso/home.html

ISO 14001 standard

<https://www.iso.org/iso-14001-environmental-management.html>

British Standards Institution, OHSAS 18001 Occupational Health and Safety Management

<http://www.bsigroup.com/en-GB/ohsas-18001-occupational-health-and-safety/>

European Union Eco-Management and Audit Scheme (EMAS)

http://ec.europa.eu/environment/emas/index_en.htm

Recycling Industry Operating Standard (RIOS)

<http://www.certifymercycling.org>

Accredited ESM certification schemes:

Certification Programs for Electronics Recyclers

<http://www.epa.gov/wastes/conservation/materials/ecycling/certification.htm>

“R2” Responsible Recycling Practices for use in Accredited Certification Programs, an accredited standard governed by R2Solutions

www.r2solutions.org/

Electronic Product Stewardship Canada Recycling Standard

http://www.epsc.ca/index.php?option=com_content&view=article&id=14&Itemid=24&lang=en

e-Stewards standard for responsible recycling and reuse of electronic equipment

<http://e-stewards.org/certification-overview/>

WEEELABEX

<http://www.weelabex.org/>

Mandate to the European standardisation Organizations (ESO) for standardization in the field of Waste Electrical and Electronic Equipment (WEEE) (Directive 2012/19/EU (WEEE)), 24 January 2013, Ref. M/518 EN

<http://ec.europa.eu/environment/waste/weee/pdf/m518%20EN.pdf>

Appendix V

Waste Prevention

Basel
Convention

I. Introduction

1. This manual provides stakeholders with general guidance on waste prevention principles, strategies and possible measures and tools. It provides examples and gives references to already existing information and experience.
2. This manual is aimed at all groups of stakeholders, especially governmental authorities working on national strategies and plans related to the environmentally sound management (ESM) of hazardous wastes and other wastes, but also commercial and private waste generators interested in measures to reduce the generated amounts and/or hazard potential of waste. The private sector is also a key partner and stakeholder in waste prevention strategies.

II. Role of waste prevention

3. Waste prevention includes practical actions that reduce the waste quantity and/or the hazard potential and/or the hazardous content of products and materials *prior to* them becoming wastes.
4. Waste prevention (i.e. strict avoidance, source reduction and direct reuse), while part of waste minimisation (that also covers reuse and recycling), is fundamentally different from all other activities within the waste management hierarchy as it is implemented *before* products or materials become wastes. Waste prevention measures occur prior to waste management, as part of strategies and actions promoting or even mandating environmentally sound production, trade and consumption. While some stakeholders may define their respective waste management hierarchies in slightly different ways, this manual references the general concept of a waste management hierarchy as follows: prevention, minimization, reuse, recycling, other recovery including energy recovery, and final disposal (see the definition in Appendix I of this document).
5. Waste prevention is the highest priority in the waste management hierarchy. Waste prevention actions at the top of the waste management hierarchy are in the first instance positioned to eliminate the need for recycling, energy recovery or disposal, and secondly, they avoid or reduce extraction of primary resources from nature (resource protection). Waste prevention shifts waste management policy from merely an end-of-life approach aimed at pollution remediation and best practice recovery and recycling, to sustainable materials management, aimed at avoidance of the depletion of natural resources, pollution and of energy use.
6. Waste prevention may involve the following strategies:
 - (a) *Strict avoidance* involves the prevention of waste generation by elimination of the need for a product, or material, or by a reduction of hazardous substances and inputs, or by reducing material or energy intensity in production, consumption, and distribution.¹ Strict avoidance also includes designing products for prolonged life. Waste prevention in this latter context extends the life of products and acts as a diversion of waste flows;
 - (b) *Source reduction* involves altering production processes to minimize the use of toxic or harmful substances and/or minimizing material or energy consumption and/or maximally substituting primary raw materials with secondary raw materials that result from high quality recycling.² Waste prevention in this context reduces or eliminates waste and pollution at source through process changes;
 - (c) *Direct reuse* means the using again of a product, object or substance that is not waste for the same purpose for which it was conceived without the necessity of repair or refurbishment;³
7. Where waste prevention is practiced at the industrial level rather than at the consumer or household level, it is known as *clean* or *cleaner production*.

A. Waste prevention in the context of the Basel Convention

8. Waste prevention is referenced in the third recital of the preamble of the Basel Convention, which affirms that “the most effective way of protecting human health and the environment from the dangers posed by hazardous wastes and other wastes is the reduction of their generation to a minimum in terms of quantity and/or hazard potential”.

¹ Strategic Waste Prevention, Organisation for Economic Co-operation and Development (OECD) Reference Manual (available in document ENV/EPOC/PPC(2000)5/FINAL).

² Ibid.

³ This definition stems from the glossary of terms, developed by the small intersessional working group on legal clarity (available in document UNEP/CHW.13/4/Add.2).

9. In Article 4, paragraph 2 (a) of the Convention, waste prevention is included as an obligation of the Parties to “ensure that the generation of hazardous and other wastes within it is reduced to a minimum, taking into account social, technological and economic aspects”. Many Basel guidance documents have referred to waste prevention as an essential aspect of ESM and as an appropriate concept to be considered when developing technical guidelines; but no overall guidance on waste prevention strategies, tools or measures was ever incorporated.

10. Most recently, the Cartagena Declaration on the Prevention, Minimization and Recovery of Hazardous Wastes and Other Wastes (2011) noted “that prevention and minimization of hazardous waste and other wastes at source are a critical stage of the waste management hierarchy”.⁴

III. Strategies and tools

11. Waste is generated from industrial, commercial and consumer activities throughout the life-cycle of materials and products. Therefore, a successful waste prevention strategy targets all relevant stakeholders throughout all life stages of a material⁵ or a product in order to effectively meet waste prevention objectives.

12. There are three essential approaches that have been widely used to prevent waste from industrial, commercial and consumer activities. These are: education, motivation and legislation. These can work together and are often most successful when integrated into a comprehensive approach that educates, motivates and mandates preventative measures or actions:

- (a) Educate for change through public awareness efforts to encourage behavioural change;
- (b) Motivate for change through measures that incentivize change or disincentivise the status-quo;
- (c) Mandate change through regulatory action;
- (d) Promote innovation.

13. All four strategies can be employed at various stages of the life-cycle of materials and products to promote waste prevention by engaging in strict avoidance, source reduction and direct reuse actions.

A. Information, education and awareness strategy

14. Creating awareness amongst the general public as well as the business community is fundamental to changing behaviour and introducing new attitudes and habits to the way people consume resources and generate waste. Sharing practical information and guiding tools about how individuals or companies can prevent and reduce waste in their daily lives, is a critical first step.

- (a) Awareness raising strategies for the public:
 - (i) Awareness raising strategies for the public employed by governments, NGOs, industry and other stakeholders have been widely successful in transferring knowledge about life-cycle, environmental and other benefits. Information campaigns about prolonging product use, through choosing durable rather than disposable products, like refillable water bottles, reusable tea or coffee cups or reusable shopping bags are but one example. Such information campaigns are a prime example of where public awareness activities over the past decade have led to a transformational shift in attitudes and behaviours away from single use bags or containers. Another example is the policy of some schools to provide drinking water to their students and urging them not to bring packaged beverages to school;
 - (ii) Eco-labelling is another important example of a tool to raise public awareness. Eco-labels help consumers identify environmentally preferable products through voluntary labelling programs. Product labels advertising less use of toxic or harmful inputs into products such as lead-free paints, phosphorous-free detergents and mercury-free light bulbs or thermometers are all examples. Report cards grading consumer products on environmental impacts is another similar approach. The Electronic Product Environmental Assessment Tool (EPEAT)⁶ provides a comprehensive list of computer equipment brands and models that use less toxic inputs among other environmental

⁴ Cartagena Declaration on the Prevention, Minimization and Recovery of Hazardous Wastes and Other Wastes (2011) (available in document UNEP/CHW.10/28 (annex IV)).

⁵ For the purposes of this manual, a material can be defined as any substance or object.

⁶ Further information available at: www.epeat.net.

criteria. It identifies computers, displays, imaging equipment and televisions that have environmentally preferable attributes, including the strict avoidance of notable hazardous constituents from production. Consumers are thus conveniently and accurately informed to be able to easily make choices which prevent hazardous waste;

- (b) Providing information and technical advice to enterprises:
 - (i) Providing information and technical advice to enterprises can sometimes be all that it is necessary to initiate waste prevention technologies and management processes. For example, in a cleaner production programme in Thailand, some universities send out students as interns to producers in order to assess and make recommendations on how to reduce resource inputs, energy and waste. This is an educational programme for students while at the same time raising awareness among producers. It is often the case that waste prevention results in greater efficiencies and reduced disposal costs. Part of the awareness raising then involves explaining the return on investment to process and product changes. Much work has already been done examining industrial processes for their waste prevention potential. These efforts are often characterized as clean or cleaner production.

B. Motivation strategy

15. Motivating strategies aim to provide incentives to induce behavioural changes that prevent waste. These can be 'hard' measures like legislated financial incentives, or 'soft' measures that do not require laws.

16. A hard stimulus is to require the internalization of costs by invoking the *polluter pays principle*. This pre-loads the environmental costs of generated wastes onto the waste generator. Ensuring that all costs for the ESM of waste are internalized in the prices of a product gives an incentive to reduce the amount of waste generated and its hazardous characteristics.

17. *Extended producer responsibility* (EPR) is a policy instrument whereby producers take financial responsibility for products that have become waste, thus incentivizing lowering environmental liabilities and costs. EPR can also be reflected in national or sub-national legislation. Likewise, advance recovery fees or deposits to ensure prolonged reuse of products or packaging is a well-known mechanism to prevent waste generation.

18. Product longevity and strict avoidance can be enhanced by promoting the *leasing of products* rather than selling them. Corporations that lease rather than sell products have more of an incentive to ensure long-life and less environmental liabilities as they retain ownership and costs at the waste stage. For example, a company that leases carpets to an office or household will be more likely to ensure that the carpet lasts a very long time and uses less toxic inputs so that they can recycle or dispose of it more easily.

19. Financial stimuli could also be created by raising taxes on wasteful products or reducing taxes on lower waste products. For example, a *tax incentive* for the purchase and installation of renewable energy technologies that reduce energy consumption and waste generation is one such stimulus strategy. The financial stimulus subsidizes upfront costs, and ultimately prevents waste from being generated at source by reducing demand for conventional energy sources that are fossil fuel intensive. Financial incentives in the form of *cash rebates* have also been successful when offered to consumers when purchasing products that meet specific environmental compliance targets.

20. Again, transforming a facility or installation to a cleaner production unit offers great potential of increased profits, making the investments worthwhile in the longer term.

21. Finally, incentives can include non-financial ones such as *awards or recognition* for well performing individuals or companies. This gives them positive social visibility and an improved reputation which creates motivation for them to continue or for others to follow suit.

C. Mandating strategy

22. Regulatory strategies, legislating directly against waste and hazard generation, are often a vital part of a comprehensive waste prevention strategy. They can take many forms, including creating bans on the use of hazardous materials in production (strict avoidance) as well as imposing limits on the volume of waste allowed to be generated (source reduction) or landfill bans. With industry at the helm of making design and production decisions that affect all other product life-cycle stages, industry is often a target for regulatory strategies. But consumers too can be required to use less wasteful or harmful methods of disposal such as landfill bans on hazardous household products. Such prohibitions can incentivize waste prevention.

23. Sustainable design requirements, producer responsibility initiatives, environmental controls through permitting and take-back mandates are all examples of regulatory strategies.

24. Other regulations have sought to restrict the use of hazardous substances in new products or limit the volume of waste generated, such as emissions targets for power production. A well known example of this is the European Union directive on the restriction of the use of certain hazardous substances (ROHS)⁷ that seeks to ensure that electronic products sold on the European market contain less hazardous substances. Another example is the EU directive establishing a framework for the setting of eco-design requirements for energy-related products.⁸ These restrictions, limits and requirements promote clean alternatives and the prevention of waste through strict avoidance in the first and source reduction in the latter case.

D. Promoting innovation

25. Promoting, funding and rewarding waste prevention innovation is also a vital part of any comprehensive waste prevention strategy. Research institutions, academia, as well as industrial actors themselves are often the cradle of new technologies, creative policy ideas and innovative societal transitions and should be encouraged.

IV. Measures and tools

26. Measures and tools promoting waste prevention are principally initiated on a government level (governments, agencies, municipalities etc.). These ideally result in concrete actions taking place at the level of waste generation by enterprises and private persons to prevent waste at source.

27. Examples of measures and tools are:

- (a) Policy measures and tools (for governments):
 - (i) Development of a comprehensive waste prevention plan by authorities including educational, motivational, and mandatory measures as well as measures to promote innovation;
 - (ii) Creating a public and corporate awareness campaign on waste prevention methods;
 - (iii) Development and application of systems of indicators for benchmarking and measuring waste prevention progress;
 - (iv) Identification of product-specific eco-design or environmental performance requirements relating to waste-preventing product design;
 - (v) Requiring some form of producer responsibility for waste management;
 - (vi) Legally binding eco-design or environmental performance requirements;
 - (vii) Create legislation limiting use of hazardous substances (e.g. EU ROHS directive referred to in paragraph 24 above);
 - (viii) Banning non-recyclable or single-use packaging or products where appropriate;
 - (ix) Adaptation of the implementation aids and guidance tools for installations subject to licensing in line with the best available techniques (BAT) on waste prevention;
 - (x) Requiring implementation of waste prevention obligations in new corporate and public buildings and facilities;
 - (xi) Reduction of counterproductive subsidies;
 - (xii) Support programmes and measures to implement waste prevention concepts and technologies;
 - (xiii) Taxes on waste-intensive products;

⁷ Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, available at: <http://eur-lex.europa.eu/legal-content/FR/TXT/?uri=celex%3A32011L0065>.

⁸ Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of eco-design requirements for energy-related products, available at: <http://eur-lex.europa.eu/legal-content/FR/ALL/?uri=CELEX%3A32009L0125>.

- (xiv) Consideration of waste prevention aspects in public procurement;
- (xv) Mandate eco-labelling;
- (b) Voluntary measures and tools (for consumers and private sector):
 - (i) Research into waste-preventing technologies and usage concepts for households or businesses;
 - (ii) Industrial and household process/modifications;
 - (iii) Information sharing fora about sustainable design and clean production methods;
 - (iv) Industrial agreements and cooperation for standardization to support waste prevention;
 - (v) Agreements between industry/commerce and government offices on waste prevention;
 - (vi) Extending existing environmental management systems to include waste prevention tactics, methods and reporting;
 - (vii) Fix one's own equipment when it needs repair;
- (c) General measures and tools (government or private sector):
 - (i) Promotion of product service (leasing) systems;
 - (ii) Promotion of, and education on, cleaner production/waste prevention;
 - (iii) Practical introduction and implementation of waste prevention and management concepts in schools;
 - (iv) Develop waste prevention campaigns for all institutions, households and businesses;
 - (v) Changing procurement and consumption patterns to purchase greener, less wasteful or toxic products;
 - (vi) Encouraging the reuse or multiple use of products (second-hand merchandise);
 - (vii) Support of repair networks (repair cafés, reuse centres, etc.) or businesses;
 - (viii) Development of quality standards and manuals for reuse and repair;
 - (ix) Cleaner events (e.g. in sport or music).

V. Challenges

28. Waste prevention at source represents a paradigm shift. It requires a new way of thinking from the prevalent “buy, use and dispose” mentality our society has promoted. Behavioural change can be a slow process. Moving away from traditional thinking is always difficult, and this is particularly so when our marketplace often rewards those that consume and produce waste more than reduce it. Consumption brings profit to many. The resistance to change or minimize consumption often comes from the fear that the economy will stagnate if consumption and waste generation is minimized.

29. *Production and consumption patterns* need time and new businesses to develop that will seek new profits from waste prevention and its benefits and efficiencies. Companies may not initially recognize the potential benefits that may come with cleaner production. Currently, companies that make the effort to improve their performance may often suffer from the lack of a level playing field with companies that do not internalize certain costs or that work informally.

30. *Lack of information* and education is in many cases a fundamental reason for not making better use of resources and implementing waste prevention or cleaner production. It is not a lack of know-how as much as it is a lack of awareness that lies at the root of change. It is vital to incentivize the spread of information on proper production processes, products or services that support waste prevention.

31. *Legislative limits, related to territory or competency* in many cases inhibit the possibilities of public authorities to intervene in production and consumption decisions, such as sustainable design. Companies may also be discouraged to show, in a transparent manner, the environmental impacts they have and to act to remediate them because of possible penalizing by the authorities. Assisting these

companies rather than punishing them may result in better performance and eventually waste prevention.

32. *Bureaucratic barriers* may often occur when government or industry departments working on waste develop their policies isolated from those working on green design. This creates a fundamental disconnect and prevents a feedback mechanism in design and public policy considerations.

33. *Rebound effects* are a general problem of environmental measures. A measure to prevent a certain waste flow may well cause other waste flows with related or other environmental adverse effects. A thorough preparation and insight into all aspects of any measure or initiative minimizes the risks on rebound effects.

34. *Measuring success* can be difficult, but quantitative indicators are helpful and often necessary to measure the effects of waste prevention measures and efforts to ensure their continued support. They are also necessary to formulate quantitative targets. There are many tools and approaches developed by countries, regions, NGOs and the private sector that may prove useful to other countries and stakeholders wishing to implement measurement indicators and targets for waste prevention.

VI. Additional information/References

35. This section does not aim to be exhaustive, but rather gives some initial references to the reader to start his or her discovery of waste prevention strategies:

- (a) Publications:
 - (i) European Environment Bureau (EEB): Creating an Efficient Waste Prevention Programme
<http://eeb.org/work-areas/resource-efficiency/waste-recycling/>
 - (ii) EEB: International Waste Prevention and Reduction Practices
<http://www.eeb.org/>
 - (iii) EU: Waste Prevention Handbook
http://ec.europa.eu/environment/waste/prevention/pdf/Waste%20Prevention_Handbook.pdf
 - (iv) EU Waste Prevention Guidelines
<http://ec.europa.eu/environment/waste/prevention/guidelines.htm>
 - (v) EU: Waste Prevention Best Practices Fact sheets
<http://ec.europa.eu/environment/waste/prevention/practices.htm>
 - (vi) EU: Taking sustainable use of resources forward: A Thematic Strategy on the prevention and recycling of waste
<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52005DC0666>
 - (vii) Germany: Waste Prevention Programme
http://www.bmub.bund.de/fileadmin/Daten_BMU/Pool/Broschueren/abfallvermeidungsprogramm_en_bf.pdf
 - (viii) OECD: Reference Manual on Strategic Waste Prevention
[http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?doclang=ge=en&cote=env/epoc/ppc\(2000\)5/final](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?doclang=ge=en&cote=env/epoc/ppc(2000)5/final)
 - (ix) OECD: Towards Waste Prevention Performance Indicators
<https://www.oecd.org/env/waste/1954291.pdf>
 - (x) UK: Waste Prevention is Better than Cure
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/265022/pb14091-waste-prevention-20131211.pdf
 - (xi) UK: Establishing the Behaviour Change Evidence Base to Inform Community Based Waste Prevention and Recycling
http://www.brooklyndhurst.co.uk/establishing-the-behaviour-change-evidence-base-to-inform-community-based-waste-prevention--recycling-_60.html
 - (xii) UNIDO CP Toolkit
<http://www.unido.org/resources/publications/safeguarding-the-environment/industrial-energy-efficiency/cp-toolkit-english.html>

- (xiii) US: Source Reduction Program Potential Manual
<http://infohouse.p2ric.org/ref/05/04278.pdf>
 - (xiv) Waste & Resources Action Programme (WRAP) Household Waste Prevention Toolkit
<http://www.wrap.org.uk/>
 - (b) Links:
 - (i) European Environment Agency
<http://www.eea.europa.eu/>
 - (ii) European Topic Centre on Sustainable Consumption and Production
<http://scp.eionet.europa.eu/>
 - (iii) California Integrated Waste Management Board Waste Prevention World
<http://www.calrecycle.ca.gov/ReduceWaste/>
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