

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 *after* 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 revised draft glossary of terms (draft version of 22 September 2016), 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 disincentivize 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 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://www.eeb.org/EEB/?LinkServID=A18351AC-5056-B741-DBC96B7204BF4AA1&showMeta=0>
 - (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/?doclanguage=en&cote=env/epoc/ppc\(2000\)5/final](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?doclanguage=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/>
 - (iv) INFORM
<http://www.informinc.org/pages/research/waste-prevention/overview.html>
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