# Waste Stream

## Name

Household Waste

## Waste description

Household Wastes are not normally regarded as hazardous waste, since they consist almost entirely of materials, which have been handled by individuals before being discarded. However, such wastes can be extremely variable in their composition, depending to a large extent on the lifestyle of the generator ([[1]](#endnote-2)). , i, os

One particular type of Household Wastes are the Household Hazardous Wastes (HHW) which contains hazardous constituent ([[2]](#endnote-3)) (such as oils, corrosive cleaners, fuels, pesticides and pathogens) that require special care, and could make the waste having some of the hazardous characteristics of the Annex III Basel Convention. Although these constitute a small portion of the wastes collected from households, they could be particularly problematic due to their hazardous characteristic, variability in chemistry and associated high recovery and final disposal and recovery costs.

## Information on waste / non-waste classification

National provisions concerning the definition of waste may differ and, therefore, the same material may be regarded as waste in one country but as non-waste in another country. For HW and particularly HHW currently there is no reference of any country considering them as a non-waste

## Classification under the Basel Convention (Annexes I, II, III, VIII and/or IX)

, Therefore, in addition to hazardous wastes (HW), the Basel Convention also controls “other wastes”, listed in Annex II, if they are subject to transboundary movement. Annex II lists wastes that would not normally be classified as hazardous, but require “special consideration”, namely

* Y46 - Wastes collected from households, and
* Y47 - Residues arising from the incineration of household wastes.

These “other wastes” are included in the annual reporting requirements of the Convention. However, a challenge in determining which figures to report under Y46 and Y47 is that in many countries waste statistics do not distinguish household waste from other municipal solid wastes (e.g. waste from commerce and trade, office buildings, institutions and small businesses, yard and garden, street sweepings, and even in some cases small generators of construction and demolition activities).

## Basel Convention guidelines and other guidelines/instruments

General guidelines:

* SBC (Secretariat of the Basel Convention). 2000c. Technical guidelines on wastes collected from households (Y46). Series/SBC No: 02/08, Geneva. Available from http://www.basel.int/Portals/4/Basel%20Convention/docs/meetings/sbc/workdoc/old%20docs/tech-y46.pdf [Accessed on 31 October 2014]
* Guidelines for the development, review and updating of National Waste Management Strategies (NWMS) <http://www.unep.org/ietc/InformationResources/Events/GuidelinesfortheDevelopmentofNationalWasteM/tabid/104470/Default.aspx> [Accessed on 31 October 2014]

Storage guidelines, exclusively for HHW:

* Department of Environment Regulation, 2013, Guidelines for the design and acceptance and storage of household hazardous waste, Department of Environment Regulation, Perth Western Australia.– Available from <http://www.wasteauthority.wa.gov.au/media/files/documents/HHW_Storage_guidelines.pdf> [Accessed on 31 October 2014]

# Waste Management

## Generation

The percentage of HHW in the household waste varies, although this percentage is about 1% weight basis in developed countries and tend to be larger in developing countries([[3]](#endnote-11)).

## Segregation

In general, to promote proper recovery and final disposal operations of household waste, there are several schemes of segregation for collection, such as wet and dry streams, or voluntary systems like green point for drop off recyclables; for example of a non-hazardous compound, vegetable oil could be collected to recover bio-diesel or energy.

Regarding the issue of hazardous components, in developed countries, such as the,it has been, since the early 1990’s, a policy ; of the(), rather than through regulations. In order to avoid the potential risks associated with HHW, those campaigns usually focused on the:

* Use and store products containing hazardous substances carefully to prevent any accidents at home. Never store hazardous products in food containers; keep them in their original containers and never remove labels.
* When leftovers remain, never mix HHW with other products. Incompatible products might react, ignite, or explode, and contaminated HHW might become unrecyclable.
* Follow any instructions for use and disposal provided on product labels.
* When a scheme of separate collection for HHW is in place, there are several specific Y-codes that may be used for separately collected fractions of hazardous compounds (HHW) in the household waste stream. In case of a waste that is a mixture of different Y-codes, only the Y-code that corresponds most closely to the waste composition is to be used for national reporting ([[4]](#endnote-12)).

## On-site collection

In general, for household waste, the waste is kept to be discarded in designated containers. These may be metal or plastic dust-bins or plastic and paper bags. In large buildings and apartment blocks, centralized containers are sometimes provided into which occupants place their waste. In most developed countries, it is usual for household waste to be collected from premises on a regular basis since food waste, in particular, decays rapidly.

For the HHW portion, there are several option of specific collection (see section b); therefore a HHW collection project is to provide safe collection, transport and disposal of these types of wastes. Collections can be offered annually, semi-annually, or on an ongoing basis. The benefits of a collection project include:

* Removes HHWs from homes and residential trash, thereby reducing the potential for HHW exposure and injury to homeowners, firefighters and refuse workers.
* Reduces the potential of HHWs being released into the environment.
* Provides HHW disposal options to citizens seeking disposal information.
* Increases public awareness of the integral role each consumer plays in overall hazardous waste problems and solutions.

## Storage of HHW

Where a separate collection system for HHW is in place, many different types of materials are expected to be found in a HHW storage facility, with relatively low quantities of each material. To reduce the risk of dangerous hazardous chemical reactions caused by the mixing of incompatible materials, it is useful to group materials into a number of site categories. These categories are based primarily on the dangerous goods class of the materials, but also take into consideration toxicological hazards ([[5]](#endnote-13)).

HHW storage facilities are often located within the site of an existing transfer station or landfill. Some activities, systems of work, structures and equipment that are not directly involved with the handling and storage of HHW materials may constitute a hazard for the HHW acceptance and storage facilities. Potential external hazard sources may include:

* any adjacent storage facilities
* the proximity of other work areas, including on-site offices
* plant used or moved on the site (e.g. ignition sources from engines)
* vehicle movements on the site
* deliveries of other hazardous/dangerous goods
* transfer of HHW materials between containers on the site
* personnel movements in normal and emergency situations
* visitor access, and unauthorized access to the HHW acceptance or storage areas
* portable sources of ignition, generation of static electricity
* fire hazards including buildings, concentrations of combustible material and uncontrolled vegetation
* weather conditions such as temperature extremes, wind, lightning, or rainfall including the potential for flooding

## Packaging and labelling

Usually for household waste there is no specific packaging and labelling., In the case of HHW the packaging and labelling must be in accordance to the specific (or main) components of the specific waste Follow the label instruction of the hazardous materials. Some labels give disposal recommendations. Read the label carefully and follow the manufacturer’s recommendations

## Transportation

As mentioned before, where is segregation at source of green points for recyclables compounds the transportation system should be available for the proper collection and transportation to the treatment facility.

For the hazardous compounds, until there is no in place a collection system design specifically for HHW, is advised to try to reduce the generation of this type of waste, in the meantime it should be managed together with When there is separate collection for HHW from the rest of the household waste there are several options:

* Permanent collection or exchange. If a community has a facility that collects HHW year-round. Some of these facilities have exchange areas for unused or leftover paints, solvents, pesticides the rest of the household waste stream., cleaning and automotive products, and other materials. By taking advantage of these facilities, materials can be used by someone else, rather than being thrown away.
* Special collection days. It consists in designated days for collecting HHW at a central location to ensure safe management and disposal.
* Local business collection sites. Drop off certain products at local businesses for recovery and recycling or proper disposal. Some local garages, for example, may accept used motor oil for recovery and recycling.

# Disposal Operations (Annex IV, Sections A and B)

In general, there is variety of disposal options, including recovery, recycling, treatment, and final disposal, although is advisable that the municipalities (in case of household waste is share in the MSW) always insist on recovery and recycling whenever possible. For non-hazardous compounds there are several alternatives (see SBC 2000c). As mentioned before, uocal regulationsregular household waste stream (see 2.b), however, if this waste in managed together with the rest of the household waste this must be disposed in a sound way. For HHW the disposal alternative should consider the specific compounds and types for the selection of the alternatives mentioned in the Annex IV, Sections A and B of the Basel Convention.

# Sustainable Materials Management (SMM)

## Extended Producer Responsibility (EPR)

There are several EPR plans dedicated to specific streams coming from household source, either hazardous or non-hazardous, some examples of specific EPR include:

* In Ontario Canada, the Municipal Hazardous or Special Waste program covers a wide range of products used in and around the house that require special end-of-life management ([[6]](#endnote-14)). Industry stewards (identified as product brand owners, franchisers, first importers or manufacturers who supply the target products into the marketplace) are obligated under the Waste Diversion Act (2002) to fund the cost of the program for the proper management or diversion of their products and their packaging. Stewardship Ontario is the organization that develops operates and implements the Municipal Hazardous or Special Waste program and is responsible for collecting fees from industry stewards to pay for industry’s program costs. Waste Diversion Ontario monitors the performance of the program and reports to the Ontario Ministry of the Environment. Consumers can return any of the materials included in the program at drop off locations free of charge
* In the EU law for waste of electric and electronic equipment for example (WEEE), producer responsibility is established. For WEEE from private households, Member States shall ensure that producers are allowed to set up and to operate individual and/or collective take-back systems for WEEE from private households provided that these are in line with the objectives of the WEEE – Directive.
* In the developing countries there are several examples of EPR (in different levels of implementation), for specific streams, for example, currently in South America there are EPR for WEEE in Peru, and for CFL, acid-lead batteries, WEEE, among others in Colombia; o for used tires (non-hazardous waste) in Argentina.

## Environmentally motivated subsidies

There are some examples of experience of environmentally motivated subsidies:

* In California, USA: for the Household Hazardous Waste Grant Program in the California State Budget for FY 2007-08 was discussed the option to anticipates five million dollars ($5,000,000) in available funding ($4,500,000 plus an additional $500,000). The criteria used to determine the size of the subsidy, included Indian reservations, and with direct responsibility for HHW management are eligible to apply.

## Green procurement

* In Alberta Canada, there is a proposal for a new regulation that will include provisions to enable EPR, and considering packaging and printed materials and household hazardous waste as the first materials designated ([[7]](#endnote-15)).

# Legislation

There are several examples of legislation (at different levels), for proper management of household waste ([[8]](#endnote-16)). Regarding HHW, as it was mentioned before, there are just a limited number countries with a system indicating the obligation (e.g.) ([[9]](#endnote-17)).

# Capacity and Feasibility

Ideally, a government should identify the resources needed to build up a national network of disposal facilities for HHW that could operate in the same network of industrial hazardous waste.

Considering that HHW are a mix of compounds, with all these materials will be in differing proportions (considering single or separate streams collection). Each material has the potential to impact differently on the environment and human health, depending on how the HHW are collected, recovered, recycled and or disposed. It is therefore most important that the HHW (HW) disposal plant has the capacity to process all the types waste materials contained in a consignment of HHW.

In any disposal facility appropriate personal protective equipment (PPE) should be worn, and Materials Safety Data Sheet (MSDS) should be readily available for employees to seek additional information about potential hazards and the appropriate corrective action in the event of an accident.

It is also essential to bear in mind that comprehensive HHW (HW) facilities are an expensive operation and while environmental sustainability is important the feasibility of maintaining such treatment processes remains viable.

# Permitting

A national policy document should form the basis for developing the law and should be complemented by technical guidelines developed for implementation of the law ([[10]](#endnote-18)). This legal “package” should specify regulations on the treatment of different waste categories; segregation, collection, storage, handling, disposal and transport of waste; and responsibilities and training requirements. The national policy should take into account the resources and facilities available in the country concerned and any cultural aspects of waste handling. A national law on hazardous waste management may stand alone, or constitute part of more comprehensive legislation. A national law should include the following elements: a clear definition of hazardous waste and its various categories, including HHW; a precise indication of the legal obligations of the waste generator regarding safe handling and disposal; specifications for record keeping and reporting; establishment of permit or licensing procedures for systems of treatment and waste handling; specifications for an inspection system and regular audit procedures to ensure enforcement of the law and for penalties to be imposed for contravention; designation of courts responsible for handling disputes arising from enforcement of, or non-compliance with, the law.

# Enforcement

The ESM of wastes requires a regulatory and enforcement infrastructure that ensures compliance with legal instruments and standards. Consideration should be given to a national (and sometimes a regional) policy that includes provisions to allow prompt, adequate and effective enforcement actions to be undertaken, including sanctions and penalties that will serve as a deterrent to non-compliance.

Measures should be in place to ensure adequate monitoring, inspection and enforcement of waste imports and exports subject to the requirements of the Basel Convention, by agents of the State and cooperation with enforcement agencies in other States (to prevent illegal traffic). Adequate penalties and sanctions for illegal traffic should discourage such movements in the future.

# Certification and Auditing Systems

It is recommended that licensed waste management facilities should be subject at least to annual inspections by the appropriate government agencies and/or audits by a recognized independent auditor (the actual periodicity of inspection will be defined under the specific authorization of each facility). The objective of the inspection and/or auditing procedure would be to: check conformance of the facility with all basic requirements to ensure the ESM of wastes, with relevant environmental regulations, and, if applicable, current EMS systems. Verifying compliance with existing laws and regulations is embodied in the European Community Eco-Management and Audit Scheme (EMAS). Under ISO 14001, a facility is required to know whether or not it is in compliance with applicable laws and regulations; without that knowledge, the facility would be considered out of conformance with that ISO standard. The inspection and/or audit should also assess the performance of the facility with respect to environment, health and safety objectives ([[11]](#endnote-19)).

# Transboundary Movements

Governments should put in place legal requirements to implement and enforce the provisions of relevant international and/or regional instruments in relation to the transboundary movement of wastes (pre-notification, prior informed consent, etc.), including the Basel Convention. Specifically, the Basel procedures apply to household waste even if it is not hazardous waste when they are included under the code Y46 in Annex II (or Waste on the amber list of the OECD Decision ([[12]](#endnote-20))).

Transboundary movements of wastes for management in another country cannot be assured to result in ESM by evaluating receiving facilities alone. Elements such as those for effective legal systems, government oversight and other infrastructure to protect the occupational health and safety of workers, communities and the environment, should also be considered. Transboundary movements of wastes should not be considered to be legal where there is a reason to believe the waste in question will not be managed according to ESM.

Notifications received by the Secretariat of the Basel Convention from Parties—pursuant to Article 13 of the Convention—on decisions to prohibit or restrict the import/export of hazardous or other wastes are published on the website of the Secretariat ([[13]](#endnote-21)).

1. SBC (Secretariat of the Basel Convention). 2000c. Technical guidelines on wastes collected from households (Y46). Series/SBC No: 02/08, Geneva. Available from http://www.basel.int/Portals/4/Basel%20Convention/docs/meetings/sbc/workdoc/old%20docs/tech-y46.pdf [Accessed on 16 March 2014] [↑](#endnote-ref-2)
2. US EPA Household Hazardous Waste, available at http://www.epa.gov/osw/conserve/materials/hhw.htm [↑](#endnote-ref-3)
3. For further information, refer to: (a) US EPA (United States Environmental Protection Agency), Household Hazardous Waste Reduction Pollution Prevention (P2) Education Toolbox. EPA-905-F-97-011. August 1997; (b) European Commission – Directorate General Environment. Gendebien, A Leavens, K. Blackmore, A. Godley, and K Lewin. Study on Hazardous Household Waste (HHW) with a main emphasis on Hazardous Household Chemicals (HHC) Final Report. Report No.: CO 5089-2 July 2002; (c) Buenrostro, Ojeda, Márquez. Comparative analysis of hazardous household waste in two Mexican regions. Waste Management 27 (2007) 792–801 (Elsevier). [↑](#endnote-ref-11)
4. SBC (Secretariat of the Basel Convention): Methodological guide for the development of Inventories of hazardous wastes and other wastes under the Basel Convention (Draft, 31 March 2014) [↑](#endnote-ref-12)
5. Department of Environment Regulation, 2013, Guidelines for the design and acceptance and storage of household hazardous waste, Department of Environment Regulation, Perth Western Australia. [↑](#endnote-ref-13)
6. Available form http://www.ec.gc.ca/gdd-mw/default.asp?lang=En&n=618F3E03-1 [↑](#endnote-ref-14)
7. EPR Canada. 2013 Extended Producer responsibility. Summary Report. September 2014 [↑](#endnote-ref-15)
8. For further information, refer to United Nations Human Settlements Programme. Solid Waste Management in the World’s Cities. Water and Sanitation in the World’s Cities. 2010 [↑](#endnote-ref-16)
9. For further information refer to the factsheets accompanying this document, including factsheets such as e-waste, batteries and used oil. [↑](#endnote-ref-17)
10. For further references on development of national strategies, refer to International Environmental Technology Centre (IETC UNEP), Guidelines for the development, review and updating of National Waste Management Strategies (NWMS), 2013. [↑](#endnote-ref-18)
11. Organisation for Economic Co-operation and Development (OECD). 2007. Guidance Manual on Environmentally Sound Management of Waste. Available at http://www.oecd.org/env/waste/39559085.pdf [↑](#endnote-ref-19)
12. OECD. Decision of the Council concerning the Control of Transboundary Movements of Wastes Destined for Recovery Operations. 14 June 2001 - C(2001)107/Final [↑](#endnote-ref-20)
13. For further information, refer to http://www.basel.int/Countries/ImportExportRestrictions/tabid/1481/Default.aspx [↑](#endnote-ref-21)