European project "Environmental protection and sustainable development: building local capacities on solid waste management in Myanmar"

ပတ်ဝန်းကျင်ကာကွယ်ရေးနှင့် ရေရှည်တည်တံ့သော ဖွံ့ဖြိုးတိုးတက်မှု :
မြန်မာပြည်တွင် စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှုအား ဒေသတွင်းစွမ်းရည်မြှင့်တင်ခြင်း

European Project: "Environmental protection and sustainable development: building local capacities on solid waste management in Myanmar" (DCI-NSAPVD/2012/310-773)

Legal Framework Report

Final output of the work package n. 1.1

Partners - ဆောင်ရွက်သူများ

CITTA' DI TORINO

ITHACA

cesvi

In collaboration with - ပူးပေါင်းဆောင်ရွက်သူ

amiat

Donors - အလှူရှင်များ

Cooperazione Italiana allo Sviluppo Ministero Affari Esteri

This project is funded by the European Union - ဤစီမံကိန်းအား ဥရောပသမဂ္ဂမှ ရံပံ့ငွေထည့်ဝင်ပါသည်။

This report was prepared in the context of the EU funded project "Environmental protection and sustainable development: building local capacities on solid waste management in Myanmar", co-implemented by the Yangon City Development Committee (YCDC) – Pollution Control and Cleansing Department (PCCD), the City of Torino, Ithaca - Information Technology for Humanitarian Assistance, Cooperation and Action, and the NGO Cesvi.

The objectives are: (1) to contribute to the integration of environment protection principles into policies and programmes in Myanmar, and (2) to strengthen the capacities of Local Authorities of Yangon City in solid waste management.

The Action is organized in three components. The component 1 aims at strengthening **institutional and technical** capacities of the YCDC in environment quality management, the component 2 aims at developing an **information system** for the solid waste management (SWM) in Yangon, and the component 3 aims at increasing the **community awareness** in best practices related to the SWM.

Each component includes several activities (work packages – WP). The first WP of the component 1 (WP 1.1) concerns the SWM legislative and bylaw Myanmar context.

The team involved in this WP dedicated the first months of the project to the analysis of the legislative/bylaw system of Myanmar and Yangon City in particular. Torino and Amiat were provided with an overview of the PCCD activities in Yangon and the municipal/national regulatory framework. The aim of this analysis was to collect the necessary information to make a comparison with EU/Italian legislation and Torino's bylaw, and to identify possible suggestions.

This report is the result of the WP 1.1.

The team that worked on this document is composed by:

- Mr Marco Ferrero – Città di Torino (Direzione Ambiente)
- Mr Marco Guercio – Amiat
- Mr Andrea Galparoli – Amiat
- Mr Sergio Bollato – Amiat
- Mr Lorenzo Salvi (Città di Torino – Servizio Relazioni Internazionali)
- Ms Cecilia Gosso (Città di Torino – Servizio Relazioni Internazionali)
- Mr Paolo Mascia (Ithaca)

INDEX

Final Report of WP 1.1 for the European project "*Environmental protection and sustainable development: building local capacities on solid waste management in Myanmar*". The legislative framework of solid urban waste management.

Section 1 – Methodology

This report is the end result of WP 1.1 for the "SWM^2" project. The purpose of the document is to compare the legislative framework of Myanmar and the byelaws of the City of Yangon with the situation in Europe/Italy and that in Turin in particular.

The Italian team that is working on WP 1.1, made up of employees of the City of Turin and managers from Amiat, the city's service provider, has analysed the current legal and organisational framework in which the Pollution Control and Cleansing Department operates (the department responsible for urban waste management in the city of Yangon).

To this end, two exploratory missions have been undertaken, in June and November 2013.

This comparison between the two situations has generated suggestions for legislative and organisational integration that Turin City Council will put to the City council of Yangon.

Where the methodology is concerned, the working group has identified a precise series of issues, in order to organise the content of the documentation. The issues are identified by letters and they are discussed in hierarchical order with reference to the Italian legislative framework, from a national to an intermediate level and finally, a municipal level (*the situation in Turin in particular*).

Another level of analysis is the distinction between the short/medium term and the long term. The most recent Italian sources were not chosen for all issues, but those deemed most suitable to offer the PCCD terms of comparison and possibilities for use and implementation in the short and medium term.

For each issue, one or two concluding paragraphs will consider the potential long-term perspective. In this case the Italian references sources are the most recent.

The following table sums up the issues to be analysed, organised in three levels, and the reference sources, both Italian and Burmese.

	Section		Issue	Italian sources selected - first implementation stage	Italian sources selected - medium/long-term development stage	Relevant Burmese sources
1	Methodology					
2	National level	A	General principles	Leg. Decree 152/2006 - part I Leg. Decree 152/2006 - part IV		Environmental Conservation Law 2012
		B	Responsibilities and jurisdiction	Leg. Decree 152/2006 - part IV		
		C	Classification of waste	DPR 915/82 + CI Resolution 27/7/84	Leg. Decree 2/2006 - Part IV Attachment D List of waste (EWC codes)	
		D	Checking/Tracking of industrial waste	Leg. Decree 152/2006 - part IV		
		E	Minimal technical standards for incinerator construction	DPR 915/82 + CI Resolution 27/7/84	Leg. Decree 59, 18 February 2005, + Leg. Decree 133, 11 May 2005 Stages: location authorisation (list of EWC authorised sites) realisation (creation of areas for: acceptance and storage of incoming waste, incineration, smoke treatment, water treatment, storage of ash and sludge) operation	
		F	Incineration procedures	Leg.Decree 133/2005	Leg. Decree 133/2005 establishes the measures and procedures put in place to prevent and minimise the negative effects of the incineration and co-incineration of waste for the environment	
		G	Minimal technical standards for landfill site construction and management	DPR 915/82 + CI Resolution 27/7/84	Leg. Decree 152/2006 - part IV + D.M. 27 September 2010 + Leg, Decree 36/2003 Stages: location authorisation realisation (waste storage ditch, leachate and biogas collection/capture and management system), operation Leg. Decree 36/2003 PR 01 Disposal: Acceptance of waste (EWC list of authorised waste, weighing, document checks, random visual checks); unloading, unloading checks and covering of waste, altimetric measurements. PR 02 Management of leachate: (capture, volumetric measurement, treatment, conformity analysis at discharge, discharge into sewer). PR 03 Management of underground and surface water (depth, quality analysis). PR 04 Management of biogas (capture, quality analysis, combustion with chimney or motor, leak detecion). PR 05 Workplace health and safety	
		H	Minimal technical standards for the construction of composting plants and characteristics of the compost	DPR 915/82 + CI Resolution 27/7/84	Leg. Decree 152/2006 part IV + Leg.Decree 75/2010 Stages: location authorisation realisation (creation of areas for: acceptance of incoming waste, preliminary treatment, bioxidation and fermentation, sieving and refining, air treatment and leachate collection) operation	
		I	Hospital waste management procedures	DPR 254/2003 a) non-hazardous hospital waste EWC 180104, 180101, 180102; b) hospital waste similar to urban waste; c) non-infectious hazardous hospital waste; d) infectious hazardous hospital waste (Sterilisation as per UNI standard 10384/94 and/or disposal as per D.M. 19/11/1997 no. 503); e) sanitary waste requiring particular disposal methods CER 180103* and 180202*. Incineration as per Leg. Decree 152/2006		
		J	Soil quality	Leg. Decree 152/2006 - part IV Chapter V Annex 5		
		K	Air quality	DPR 203/88	AIA for specific type of plant	

		L	Quality of underground water	Leg. Decree 152/2006 - part IV Chapter V Annex 5		
		M	Quality of surface water	Law 319/76	Leg. Decree 152/2006 - part III and part IV	
		N	Checks and authorisations	CI Resolution 27/7/84		
		O	Taxation (1)	Leg. Decree 152/2006 - part IV Stability Law 2014		
		P	Waste recovery	DM 161/2002	DM 161/2002 (hazardous waste) + D.M. 186/2006 (non-hazardous waste)	
3	"Intermediate " level (regions and provinces, ATOR+CUB)	Q	Parties and roles	Regional Laws 24/2002 and 7/2012 Regional and provincial plans (PRGR and PPGR)		YCD Law 1990
4	Municipal level	R	Principles for solid urban waste management	RGR 280/2005		YCDC Order 3/96 YCDC Notification 10/99 "Rules for scavenging and cleansing" YCDC Draft Regulations
		S	Classification and assimilation criteria. Regulation of waste producers			
		T	Criteria for organisation of sweeping services.			
		U	Regulation of particular waste-producing activities: e.g. local markets, building sites, etc.			
		V	Taxation (2)	Reg TARSU 210/1994-2012	Reg TARES (TARI?)	

Section 2 – National level

A – General principles

The situation in Italy

In 2006 the Italian government decided to unify all the pertinent legislation regarding water, air and waste in a single document, known as the "Environmental Law or Consolidated Environmental Law" (*referred to as TUA for brevity*), which set the following goals:

- to safeguard the environment
- the rational use of natural resources

The general principles may be summed up as:

1) the protection of the environment: this is the responsibility of society as a whole, physical and legal persons, including public and private organisations
2) "environmental action": every human action must respect the principles of:
   - precaution
   - prevention
   - correction,

   and every action must respect the "polluter pays" principle
3) sustainable development: the well-being of current generations must not compromise that of future generations. Public authorities must take this into account when they compare public and private interests
4) subsidiarity: the State only intervenes in environmental matters when the lower territorial authorities are unable to intervene or simply do not. The Regional governments may intervene in the same matters but only with more restrictive measures.

Where urban waste management is concerned, the fundamental points established in the TUA are:

1) waste management is an activity of public interest
2) waste management must not cause:

- danger for human beings

- risks for water, air, soil, fauna or flora
- inconvenience due to noise or smell
- damage to the landscape

3) producers of goods have an "extended responsibility" in time even for the waste that remains after its use. Manufacturers therefore have to take responsibility for managing the residual waste (even financially), for divulging information regarding the reuse and recycling of the product, and plans to reduce their environmental impact
4) waste management respects the following hierarchy, or order of priorities:

- prevention
- reutilisation
- recycling
- recovery (even in the form of energy recovery)
- disposal

5) the network of plants must guarantee self-sufficiency for the disposal/processing of non-hazardous waste in an "optimal territorial context", and proximity in order to reduce transport of the waste

Comparison with the situation in Myanmar

The *Environmental Conservation Law* of 2012 contains numerous elements that are very similar to those set out above.
Points "d" and "e" of article 3 recall the two general objectives of the TUA.
The definition of "beneficial use" (art. 2 - j) refers to the concept of prevention as an essential element of the principle of "environmental action".
Article 2 point "c" refers to future and present generations as the beneficiaries of the conservation of the environment.
This principle reiterates the principle of sustainable development in the Italian TUA.
And finally, in its definition of the environment and of pollution (art. 2 points "a" and "e") the Law refers to the elements to safeguard when managing waste, as described in point 5 of the previous paragraph.

Possible elements to integrate

The future waste management law of the YCDC could indicate the following principles, possibly quoting the provisions of the *Environmental Conservation Law* mentioned above:

- sustainable development, seen as responsibility for future generations, could be inserted, possibly in reference to article 2 point c of the *Environmental Conservation Law*
- protection of the environment as everyone's responsibility: the general public, private businesses and public organisations
- waste management as an activity of public interest
- management of waste that is not hazardous to human beings, with no risk to water, air, soil, fauna or flora, no inconvenience due to noise or smell, and no damage to the landscape, possibly quoting the definitions of environment and pollution used in the *Environmental Conservation Law* (art. 2 points "a" and "e")
- the order of priorities in waste management: prevention/reuse/recovery/recycling as both rules and regulations for the general public and self-regulation for the PCCD
- the breakdown of the territory of Yangon City into one or more territorial areas, striving to achieve self-sufficiency in terms of the disposal/processing of urban and similar waste

produced there, and to respect the criterion of proximity, in order to reduce handling of said waste *(to this end, the results of Component 2 may be useful for further operational analysis)*.

It appears advisable to consider the principles of "the polluter pays" and the "extended responsibility" of the manufacturers of goods from a long-term prospective, even if article 7-o of the *Environmental Conservation Law* seems to go in this direction when it defines the responsibilities of the Ministry for the Environment.

The principle of subsidiarity does not apply to a municipal byelaw. It might be a suggestion at a central level.

B – Responsibilities and jurisdiction

No suggestions emerge for the YCDC byelaws regarding this issue, nor is a comparison with Burmese sources useful, because a comparison of the territorial breakdown of the two countries (in the case of Italy: central government – regions – provinces – municipalities) should be dealt with and examined in detail.

This paper only aims to give a rough idea of the responsibilities of the Italian territorial authorities, as a general introduction to the issues that will be considered from an operational perspective in section 3.

The main responsibilities that the TUA attributes to the State where waste management in concerned, in addition to overall policy and coordination, envisage the definition of:

- waste management criteria
- minimum content of authorisations
- guidelines to limit waste production
- plans to reduce/recover/recycle waste flows
- plants of national interest
- a general communications plan
- guidelines for regional plans and the identification of ATOs (optimal territorial districts)
- definition of guidelines for calls to tender for waste management, and the technical/financial conditions for participants to meet
- indication of criteria for sorting waste
- definition of limits of acceptance for certain substances contained in waste
- adoption of standards for the use of compost

The main responsibilities attributed to the regional, provincial and municipal authorities, which we will consider in greater detail in the section dedicated to the intermediate level, are:

- adoption of regional waste management plans (PRGR)
- approval of plans for new plants
- authorisation to carry out waste disposal
- definition of the optimal territorial districts (ATO) and catchment consortia
- periodical checks on all waste management activities, even with inspections of organisations and businesses

- administrative, technical and logistic management of the integrated urban and similar waste management system
- adoption of byelaws governing urban and similar waste management

C – Classification of waste

The situation in Italy

As anticipated in section 1 above, the Italian source selected for this matter is not the most recent, but the most suitable one to provide the PCCD with a valid comparison and possibilities of use and implementation in the short/medium term.

Italian Presidential Decree (DPR) no. 915/1982 introduced the concept of the classification of waste, adopting the principles of a specific European Directive.

In addition to defining waste ("any substance or object deriving from human activities or natural cycles") DPR 915/1982 also identified three categories of waste.

Urban waste, i.e.:
- bulky and other waste not originating from residential housing
- waste of any kind lying on roads and public areas or areas used by the public, or on beaches or river banks

Special waste, i.e.:
- residues of industrial/agricultural/craft/commercial activities
- hospital waste
- demolition, construction and excavation materials
- end-of-life motor vehicles
- residues of waste processing and water treatment

Toxic/hazardous waste, i.e. waste containing the following substances:
- arsenic and compounds
- mercury and compounds
- cadmium and compounds
- thallium and compounds
- beryllium and compounds
- compounds of hexavalent chromium
- lead and compounds
- antimony and compounds
- phenols and compounds
- organic and inorganic cyanide
- isocyanates
- organic halogenated compounds excluding inert polymers
- chlorinated solvents
- organic solvents
- biocides and phytopharmaceutical substances
- tar-based products deriving from refinery processes and tarry residues from distillation

- pharmaceutical compounds
- peroxides, chlorates, perchlorates and nitrides
- ethers
- unidentified chemical laboratory substances or new substances with unknown effects
- asbestos (dust and fibres)
- selenium and compounds
- tellurium and compounds
- polycyclic aromatic compounds (with cancerogenic effects)
- metal carbonyls
- soluble copper compounds
- acid and/or base substances used to treat metal surfaces
- polychlorinated biphenyls, polychlorinated terphenyls and their mixtures

DPR 915/1982 attributed the management of urban waste, residues of the processing of urban waste and the treatment of urban wastewater to the Town councils, with "exclusive rights" (monopoly).

Responsibility for Special waste, on the other hand, was attributed to the manufacturer, either directly or through authorised agencies, or by awarding its management to the public service provider with a specific agreement.

Comparison with the situation in Myanmar and possible elements to integrate

The Burmese sources that we are aware of do not contain a precise standard that classifies waste into specific categories. However, the issue is touched on in the *Environmental Conservation Law* (art 7-g), which attributes responsibility for defining categories for hazardous waste to the Ministry for the Environment.

A classification similar to that of the Italian DPR 915/82 could be included in Burmese legislation, even as municipal byelaw(s).

Waste classification could simplify the entire management system and simplify various related activities, for example procedures to authorise or modify waste processing plants, storage criteria, means of transportation, etc..

The long-term perspective

From a long-term perspective, waste could be classified on the basis of the substances it actually contains, along the lines of international standards regulating the labelling of hazardous substances. A coded list of waste could be adopted (similar to the Italian CER list) which is able to define in advance for most substances, which are dangerous and which are not.
This approach will make it possible to adopt a number of technical standards to indicate:

- recovery techniques
- the quality of the materials recovered
- the main emissions limits of the plants.

As mentioned earlier, the adoption by the government of Myanmar of international technical standards to label hazardous substances would make it possible to adopt the principles of this legislation to manage hazardous waste.

The advantage would be to classify hazardous waste according to the type of risk posed by the substances it contains, identifying processing/disposal methods with the least impact in terms of risk to man and the environment.

We must remember that a system of voluntary agreement exists, known as GHS (Globally Harmonised System of Classification and Labelling of Chemicals), as well as CLP (Classification, Labelling and Packaging of substances and mixtures), which stems from GHS.

GHS is a voluntary worldwide programme to harmonise criteria to identify and communicate the dangers posed by chemical substances. It divides the dangers into:

- physical dangers
- dangers for the health
- dangers for the environment

and establishes the criteria to communicate danger to both professional users (SDS and labelling) and consumers (labelling).

In 2008 Europe approved EC Regulation no. 1272/2008, or CLP, for the classification, labelling and packaging of substances and mixtures.

The Commission for environmental affairs set up in Myanmar in 1990 adopted the principles of Agenda 21, which includes those regulating management of toxic, hazardous and dangerous waste to protect the environment.

To date, no institution has been set up to develop this specific matter, but there are several legal references that could be used and harmonised, with the goal of assimilating GHS.

D – Checking/tracking of industrial waste

The situation in Italy

The definition of waste based on current legislation (TUA) is as follows: ***"Any substance or object which the holder/producer discards or intends or is required to discard".***

This therefore results in a ***"responsibility"*** on the part of the manufacturer/holder, who thus attributes to a specific object/substance the "legal status" of waste, as a result of his decision to discard it.

Legal requirements linked to the collection, transport and final processing of waste (disposal or recovery, even in the form of energy) contemplate various procedures, all with the aim of guaranteeing that it can be tracked:

- classification of the quality of the waste and the nature and concentration of the hazardous substances it contains;
- wrapping, packaging and labelling for each specific type and its particular hazard;

- maximum temporary storage times (*permanence at manufacturing site*);
- maximum storage times (*permanence at recovery site*) and preliminary deposit times (*permanence at disposal site*);
- transportation/shipment by appropriately authorised firm
- final allocation (*recovery or disposal*) to authorised plant

The manufacturer is responsible for classifying the waste.

The classification system envisaged by the TUA is based on the codes envisaged in the European Waste Catalogue, the so-called EWC codes.

Waste is classified by a six-digit EWC code:
- the first two digits identify the activity that generates the waste
- the second two digits identify the manufacturing process that generates the waste
- the last two digits identify the specific characteristics of the waste.

The hazardous nature of the waste is indicated by an asterisk (*) at the end of the code.

In addition to the classification envisaged by the TUA there is a classification envisaged by the "European agreement concerning the international carriage of dangerous goods by road" (or "ADR"), which also applies in Italy. This classification, which regulates the transport of dangerous goods and waste, is based on a four-digit "UN identification number".

Because of the simultaneous presence of different substances used in a manufacturing process *(known to the manufacturer)*, ADR standards often make it difficult to identify the right classification; they group hazardous goods and waste according to the type of danger they pose, in classes identified by a number:
- Class 1: Explosive materials and objects;
- Class 2: Compressed, liquefied or dissolved pressurised gases;
- Class 3: Inflammable liquids;
- Class 4.1: Inflammable solids;
- Class 4.2: Spontaneously combustible substances;
- Class 4.3: Substances that emit inflammable gas in contact with water;
- Class 5.1: Oxidising substances;
- Class 5.2: Organic peroxide;
- Class 6.1: Toxic substances;
- Class 6.2: Infectious substances;
- Class 7: Radioactive material;
- Class 8: Corrosive substances;
- Class 9: Miscellaneous dangerous goods.

To make waste tracking possible, and to simplify the administrative aspects and reduce paper documentation, the TUA envisages a system of computerised checks, dedicated initially to special waste, and known as **SISTRI**.

The paper system is based on three documents:
- in/out register
- waste identification forms or "transport document form" (*FIR*)
- environmental declaration single form (*MUD*)

The in/out register is a ledger stamped by a controlling watchdog, in which producers of waste note down:

- the quality of the waste produced
- the quantity of waste stored/deposited
- storage/deposit times
- the date and number of transports performed for recovery/disposal
- the identification number of every transport form (FIR)
- the name of the plant that has accepted the waste and its weight, verified at destination with a homologated scales.

The FIR is a transport document, drafted in 4 copies, that contains particulars of the:

- manufacturer of the waste
- haulier
- possible broker
- destination plant.

The MUD is an annual declaration that sums up the movements of waste produced; it is sent to a monitoring agency known as a Chamber of Commerce.

This agency cross-checks the data collected with those in the databanks of the provincial authorities, which are responsible for authorising the plants and monitoring the various firms.
This cross-checking of the data is very important to detect any discrepancies in the waste generation data.

SISTRI, on the other hand, exploits waterproof sensors (*black boxes*) installed on all vehicles that transport waste, and works in real time; it is managed by the Environmental Protection service of the Carabinieri.

Under SISTRI, the paper system is completely replaced by the SISTRI chronological register and handling schedules, which are handed over to the auditing authorities whenever they ask for them.
The handling forms are stored electronically by the party responsible for doing so, for at least three years from the date that the waste was registered or handled.

Comparison with the situation in Myanmar and possible elements to integrate

The Burmese sources that we are aware of do not contain any standards governing the tracking of waste.

It might therefore be useful to gradually introduce some form of classification and tracking, starting initially only with a few classes and, above all, focusing on the principle of the responsibility of waste producers (*particularly special waste*).

E – Minimum technical standards for incinerator construction

The situation in Italy

The Italian source chosen is not the most recent, but the most suitable one to provide useful concrete elements for a first operational approach: the Resolution of the Inter-Ministerial Committee of 27/7/84.

This standard is the source that introduced minimum technical standards for the incineration of urban, special and toxic-hazardous waste in Italy, establishing that every unit of the incinerator plants used must be fitted with a secondary combustion chamber (post-combustion) that meets the following operational parameters:

Oxygen content in the damp fumes (measured at the exit from the chamber)	> o = 6% in volume
Average gas speed (measured at the entrance to the chamber)	> o = 10 ms/s
Contact time	> o = 2 s
Fume temperature	> o = 950 degrees

For waste with an organic chlorine content above 2%:

Oxygen content in the damp fumes (measured at the exit from the chamber)	> o = 6% in volume
Average gas speed (measured at the entrance to the chamber)	> o = 10 ms/s
Contact time	> o = 2 s
Fume temperature	> o = 1200 degrees

The combustion yield, i.e. the ratio between the concentration of carbon dioxide and the sum of concentrations of carbon dioxide and the carbon monoxide in the combusted gases, must exceed 99.9%.

Automatic systems must be adopted in all plants used to incinerate waste, to guarantee that they function at operating values equal to or higher than the minimum established when authorisation was granted.

A continuous system must be employed to measure the fumes exiting the chamber and to register the temperature and concentration of free oxygen.

And finally, the chimney effluents must be analysed periodically, and at least every six months, to verify whether they contain organic chlorinated micropollutants (*polychlor dibenzodioxin, polychloro dibenzo furan, polychlorobiphenyl, polychlor naphthalene*) and total heavy metals, lead, mercury and cadmium.

Comparison with the situation in Myanmar and possible elements to integrate

The Burmese sources that we are aware of do not contain minimum technical standards for incineration. It is therefore to be hoped that standards similar to that outlined above can be introduced, even as municipal byelaws.

However, the introduction of these technical parameters presupposes the existence of an entity responsible for authorisations and periodical checks, with both the authority and the expertise necessary to measure, assess and process the data collected.

The introduction of a similar standard would also impact on the way contracts are managed and on relations with the entity responsible for running the incinerator.

The long-term perspective

In the long term, waste combustion plants will be transformed from incinerators to waste-to-energy plants, with the following minimum goals:

- recovery of energy and of heat in order to create cold (ice, air conditioning, etc.) or hot circuits for the industrial sector
- gassy emissions treatment plants able to guarantee compliance with legal limits
- constant monitoring and registration of the gassy effluent of CO concentrations, NOx, SO_2, total powders, TOC, HCl and HF, the volumetric oxygen content, temperature, pressure, water vapour content and the volumetric capacity of the gassy effluent and the temperature of the gas near to the inner wall
- monitoring at least every four months of heavy metals, dioxins and furans and IPA
- monitoring of wastewater
- reduction of the toxicity of residues adopting the best technologies to recover sludge.

What is more, in view of the peculiar nature of the plant, every aspect of the entire waste-to-energy cycle should be regulated by specific authorisations, similar to the Italian AIA (Integrated Environmental Authorisation), which must set rules and limits for the following, in order to reduce the plant's impact on the environment:

- the aforesaid emissions into the atmosphere;
- how wastewater is managed (with limits on the discharge and consumption of water resources);
- the protection of underground and surface water and monitoring of their consumption;
- management and checking of the waste produced;
- for processing and disposal plants, the list and maximum admissible quantities of the waste entering the plants;
- limits regarding noise emissions;
- monitoring of performance indicators in order to improve every operational aspect of the plant.

This authorisation should be requested before the plant is built and will have a limited duration (the plant that serves the City of Turin has a duration of five years), at the end of which the appropriate renewal must be requested sufficiently in advance of the expiry date (six months for the City of Turin).
And finally, when planning new plants, the impact that they will have on the surrounding environment must be taken into consideration, paying particular attention to the precipitation to the ground of emissions released into the atmosphere. As a result, it is particularly important to

study the direction and intensity of the ground and high altitude winds, but also the hydrographic classification of the area for the consumption of technological water.

An assessment of the roads leading to the site (with the possible construction of new roads and/or the extension of existing roads), would make it possible to minimise the vehicular impact on the area (*considering the vast area that the City of Yangon will cover, the construction of a plant in an area served by the railway, could on one hand simplify the delivery of waste, while on the other boosting the development of the railway network which will also be used for other purposes).*

For greater details about the proposals in the long term, we refer you to the next point.

F – Incineration procedures

The situation in Italy

Leg. Decree 133/2005 is the reference source that defines the measures and procedures to prevent and reduce the potential negative effects of incineration and co-incineration (waste-to-energy plants).

For the issue under examination, the law regulates:
- procedures for waste acceptance
- operating conditions
- the limits on emissions into the atmosphere
- sampling of emissions
- emissions into bodies of water

Where the procedures for waste acceptance are concerned, it is envisaged that before delivering them to the plant:
- the mass of each category of waste must be determined
- representative samples must be taken (*excluding infectious waste*) in order to analyse the quality of the waste and its suitability for the incineration process

Where the operating conditions of the plant are concerned, it is envisaged that:
- the best possible level of incineration is obtained, pre-treating the waste if necessary (*to eliminate any residual wet waste*): the sludge and heavy ash produced by the incineration process cannot contain total unburnt residues (such as total organic carbon) exceeding 3% in weight
- the gas produced is taken to a temperature of 850° C for at least two seconds
- each unit of the incineration plant is equipped with at least one auxiliary burner to maintain the minimum temperature
- as much of the heat generated is recovered as possible (*waste-to-energy*)
- effluent emissions are controlled, with particular reference to air quality standards (*we refer you to point K*)

Where the emissions limits are concerned, the parameters summarised in the following tables must be respected.

Average daily emissions	
Total dust	10 mg/m^3
Organic substances in the form of gas and vapour, expressed as total organic carbon (TOC)	10 mg/m^3
Inorganic chlorine compounds in the form of gas or vapour, expressed as hydrochloric acid (HCl)	10 mg/m^3
Inorganic fluorine compounds in the form of gas or vapour, expressed as hydrofluoric acid (HF)	1 mg/m^3
Sulphur oxides expressed as sulphur dioxide (SO_2)	50 mg/m^3
Nitrogen oxides expressed as nitrogen dioxide (NO_2)	200 mg/m^3

Average emissions over 30 minutes		
	100% (A)	97% (B)
	100% (A)	
Total dust	30 mg/m^3	10 mg/m^3
Organic substances in the form of gas and vapour, expressed as total organic carbon (TOC)	20 mg/m^3	10 mg/m^3
Inorganic chlorine compounds in the form of gas or vapour, expressed as hydrochloric acid (HCl)	60 mg/m^3	10 mg/m^3
Inorganic fluorine compounds in the form of gas or vapour, expressed as hydrofluoric acid (HF)	4 mg/m^3	2 mg/m^3
Sulphur oxides expressed as sulphur dioxide (SO_2)	200 mg/m^3	50 mg/m^3
Nitrogen oxides expressed as nitrogen dioxide (NO_2)	400 mg/m^3	200 mg/m^3

Average emissions obtained in a sampling period of 1 hour	
a) Cadmium and its compounds, expressed as cadmium (Cd)	
b) Thallium and its compounds, expressed as thallium (T)	0.05 mg/m3 total
c) Mercury and its compounds, expressed as mercury (Hg)	0.05 mg/m^3
d) Antimony and its compounds, expressed as antimony (Sb)	0.05 mg/m3 total
e) Arsenic and its compounds, expressed as arsenic (As)	

f) Lead and its compounds, expressed as lead (Pb)	
g) Chromium and its compounds, expressed as chromium (Cr)	
h) Cobalt and its compounds, expressed as cobalt (Co)	
i) Copper and its compounds, expressed as copper (Cu)	
j) Manganese and its compounds, expressed as manganese (Mn)	
k) Nickel and its compounds, expressed as nickel (Ni)	
l) Vanadium and its compounds, expressed as vanadium (V)	

Maximum average emissions obtained with a sampling period of 8 hours	
Dioxins and furans (PCDD + PCDF)	0.1 mg/m^3
Polycyclic aromatic hydrocarbons (PAH)	0.01 mg/m^3

Emissions limits for carbon monoxide (CO)
50 mg/m^3 as a daily average value;
100 mg/m^3 as an average value over 30 minutes, in a period of 24 hours or, in the event that this limit is not totally respected, 95% of the average values over 10 minutes does not exceed 150 mg/Nm^3

The standard conditions are as follows:
- temperature 273 °K
- pressure 101.3 kPa
- dry gas

and a reference oxygen content in the dry gas effluent of 11% in volume, using the following formula:

$$Es = \frac{21 - Os}{21 - Om} \times Em$$

in which:
Es = emission concentration calculated with the reference oxygen content;
Em = measured emission concentration;
Os = reference oxygen content;
Om = measured oxygen content.

Where co-incinerators (*waste-to-energy plants*) are concerned, the indications below must be followed.

The following “mixture formula" must be applied whenever a specific total emission value "C" is not established in the Attachment.

The limit for each polluting agent and for the carbon monoxide present in the gassy effluent that is the result of the co-incineration of waste is calculated as follows:

$$\frac{V_{rifiuti} \times C_{rifiuti} + V_{processo} \times C_{processo}}{V_{rifiuti} + V_{processo}} = C$$

$V_{rifiuti}$: volume of gassy effluent deriving from the incineration of waste alone, established on the basis of the waste with the lowest specific calorific value in the authorisation and regulated at the conditions indicated in paragraph B of Attachment 1.
If the heat released by the incineration of hazardous waste is below 10% of the total heat released by the plant, $V_{rifiuti}$ must be calculated on the basis of a (fictional) quantity of waste which, if incinerated, would release the equivalent of 10% of the total heat released by the plant.

$C_{rifiuti}$: maximum emissions limit for established incineration plants

$V_{processo}$: volume of gassy effluent deriving from the plant process, including the combustion of the authorised fuels usually used in the plant (excluding waste), determined on the basis of the oxygen content envisaged by law to standardise emissions. In the absence of legislation for the pertinent type of plant, the real oxygen content of the gassy effluent must be used, undiluted with the addition of air that is not indispensable for the process.

$C_{processo}$: maximum emissions limit indicated in this Attachment for certain industrial sectors or, in the absence of said values, the maximum limit of the emission of pollutants and carbon monoxide established by national or regional legislation for these plants when normally authorised fuels are burned (excluding waste). In the absence of such legislation, the maximum emissions limit indicated in the authorisation applies. If the authorisation does not mention these values, the total actual concentrations must be used.

C: maximum total emissions and oxygen content identified for a number of industrial sectors and certain pollutants or, in the absence of said volumes, total emissions levels to be respected for each polluting agent and for carbon monoxide. The total reference oxygen content, which replaces the reference oxygen content for standardisation, is calculated on the basis of the oxygen content given above for $V_{rifiuti}$ and $V_{processo}$ respecting partial volumes.

Average daily emissions for cement furnaces	
Total dust	30 mg/m^3
Organic substances in the form of gas and vapour, expressed as total organic carbon (TOC)	10 mg/m^3
Inorganic chlorine compounds in the form of gas or vapour, expressed as hydrochloric acid (HCl)	10mg/m^3

Inorganic fluorine compounds in the form of gas or vapour, expressed as hydrofluoric acid (HF)	1 mg/m^3
Sulphur oxides expressed as sulphur dioxide (SO_2)	50 mg/m^3
Nitrogen oxides expressed as nitrogen dioxide (NO_2) For existing plants	800 mg/m^3
Nitrogen oxides expressed as nitrogen dioxide (NO_2) For new plants	500 mg/m^3

Similar indications, with the necessary specifications, apply to combustion plants that co-incinerate waste.

Where emission sampling is concerned, it is envisaged that:

- the concentrations of CO, NOx, SO_2, total dust, TOC, HCl and HF in the gassy effluent are measured and recorded continuously
- the volumetric oxygen content, the temperature, pressure, water vapour level and volumetric flow of gassy effluent are measured and recorded continuously
- the following parameters are checked for the gases produced in the harshest operating conditions:
    a) residence time;
    b) minimum temperature;
    c) oxygen content.

The following limits are envisaged for emissions into water bodies

Maximum limit for emissions into wastewater discharges due to the purification of gassy effluent		
	95%	100%
Total suspended solids	30 mg/l	45 mg/l
Mercury and its compounds, expressed as mercury (Hg)	0.03 mg/l	
Cadmium and its compounds, expressed as cadmium (Cd)	0.05 mg/l	
Thallium and its compounds, expressed as thallium (TI)	0.05 mg/l	
Arsenic and its compounds, expressed as arsenic (As)	0.15 mg/l	
Lead and its compounds, expressed as lead (Pb)	0.2 mg/l	
Chromium and its compounds, expressed as chromium (Cr)	0.5 mg/l	
Copper and its compounds, expressed as copper (Cu)	0.5 mg/l	

Nickel and its compounds, expressed as nickel (Ni)	0.5 mg/l
Zinc and its compounds, expressed as zinc (Zn)	1.5 mg/l
Dioxins and furans (PCDD + PCDF)	0.3 mg/l
Polycyclic aromatic hydrocarbons (PAH)	0.0002 mg/l

Comparison with the situation in Myanmar and possible elements to integrate

Comparison with the situation in Myanmar leads us to the same conclusions as the previous point.

The gradual introduction of limit parameters for incinerator and waste-to-energy plants would have significant consequences for the overall protection of the environment and for more consistent direct management of the plants.

In the medium to long term it would also increase the expertise of both private laboratories responsible for monitoring activities and the offices responsible for checking the plants.

G – Minimum technical standards for the construction and management of landfill sites

The situation in Italy

In this case too, the Italian source chosen is the Resolution of 27/7/84 of the Inter-Ministerial Committee, implementing DPR 915/1982, which introduces technical standards for the construction of landfill sites.

The Resolution considers landfill sites for solid urban and similar waste, but also for non-toxic sludge deriving from water purification.

All landfill sites must respect the following general rules:

- they must be located at a safe distance from residential areas, road systems, drinking water supply points and flood beds of lakes, rivers and streams
- they must be located on stable ground (no risk of landslides)
- they must be designed so that the leachate does not pollute the surface water or water tables, using waterproofing materials to prevent any leaks
- the waterproof sheet on the bottom must be positioned at least 150 cm from the maximum historical level of the water table
- the waterproof sheet on the bottom must be laid on a layer of ground with permeability of < o = to 10-6 cm/s and at least 100 cm thick
- drainage and leachate collection systems (*tank pumping*) must be in place, which will operate for the entire programmed post-conduction period
- systems to capture and recover biogas must be envisaged, operational for the entire post-conduction period envisaged
- the surface exposed to atmospheric agents must be limited

- they must be cultivated in superimposed and compacted layers, in order to limit the use of land and to prevent phenomena of instability
- the waste must be covered daily
- they must envisage suitable channels for the collection and removal of rainwater
- they must be surrounded by fencing at least 200 cm high to prevent the access of persons and animals
- they must be equipped with suitable fire prevention systems
- once they are completed, they must be covered to prevent the infiltration of rainwater, and this covering must be covered by a layer of at least 100 cm of natural soil, with a slope to enable rainwater to drain away
- it is forbidden to sort the waste manually, or to burn the waste left at the landfill site
- in/out registers must be kept every day

Landfill sites for construction scraps, material from demolition, construction and excavation work, ceramics, glass and rocks, must respect not only the preceding rules but also the following:

- powdery waste, subject to the force of the wind, must be transported covered and stored in appropriate containers

Landfill sites for special and toxic/hazardous waste (even asbestos dust and fibres), must respect not only the preceding rules but also the following:

- the waterproof sheet on the bottom must be laid at least 100 cm from the maximum historical level of the water table
- when the area is reclaimed, phenomena of subsidence, leachate and the drainage of rainwater from the area must be taken into consideration

Landfill sites for waste from industrial, agricultural and commercial activities and residues of the treatment of waste and water purification (categories of special waste) and for toxic/hazardous waste, but not for inflammable waste, waste that reacts with water, liquids or hospital waste, must respect not only the preceding rules but also the following:

- they must not be positioned in seismic or volcanic areas
- they must be located at a safe distance from drinking water supply points and flood beds of lakes, rivers and streams, and at least 2000 metres from residential areas
- the bottom and walls must be waterproofed with a sheet that resists the aggressive action of the waste dumped
- the waterproofed bottom sheet must be laid on a layer of ground with permeability of < o = to 10-7 cm/s and at least 200 cm thick
- the waterproof sheet on the bottom must be laid at least 200 cm from the maximum historical level of the water table
- they must be cultivated in superimposed and compacted layers, in order to limit the use of land and to prevent phenomena of instability, avoiding slopes of more than 30%
- incompatible materials must be kept separate and at a distance

Landfill sites for particularly dangerous toxic/hazardous waste, must respect not only the preceding rules but also the following:

- the waste must be contained in hermetically closed receptacles that resist both the contents and external agents
- the receptacles must be placed on supports that separate them from the bottom, to highlight any leaks and simplify inspections

- the receptacles must be placed in cement basins with a slope that collects any leaks in collection sumps
- in the event of liquid waste, the basins must have a capacity of at least one tenth of the receptacles, and in any case equal to the largest receptacle
- suitable ventilation conditions must be guaranteed
- incompatible waste must not come into contact
- the receptacles must be marked
- the receptacles must be decontaminated after use, and certainly never used again for food products
- they must be surrounded by fencing at least 250 cm high to prevent the access of persons and animals
- they must be manned 24/7 by at least two employees
- an emergency plan must be drafted

In addition, the Resolution envisages important rules for the temporary storage of toxic/hazardous waste:

- the receptacles must have suitable resistance levels for the chemical-physical properties of the waste they contain
- types of waste that might react dangerously with each other must be stored so that they cannot come into contact
- any aboveground tanks for liquid waste must be equipped with a containment tank with a capacity equal to the entire volume of the tank
- tanks for liquid waste must be equipped with anti-overflow devices
- the bales must be positioned on bases that resist the action of the waste, protected from the action of rainwater and wind
- the receptacles must be marked
- the receptacles must be decontaminated after use, and certainly never used again for food products

Comparison with the situation in Myanmar and possible elements to integrate

The Burmese sources that we are aware of do not contain minimum technical standards for the construction and management of landfill sites. It is therefore to be hoped that standards similar to those outlined above can be introduced, initially as municipal byelaws.

The YCDC could:
1 – identify standards common to several types of plant that are applicable in the short-medium term, and include them in the byelaws as general rules
2 – envisage specific standards for hazardous waste landfill sites as specific rules for defined waste flows
3 – envisage specific standards for the temporary storage of hazardous waste

The long-term perspective

In the long term, landfill sites are places that must have a limited impact on the surrounding ecosystem. This is why it is essential to adopt technical standards that can guarantee:

- the correct planning and development of systems to protect the water table

- the correct planning and development of systems to regulate and drain rainwater and leachate
- correct capture of biogas and efficiency in the capture of at least 50% of the biogas produced
- the correct planning and development of suitable closure systems that can guarantee the rapid reclamation of the landfill sites at the end of their life.

A preliminary study should also be conducted to identify the most suitable area to locate the disposal plant, taking into account aspects such as the potential impact on the population, on the soil, and on surface and underground water.

An assessment of the access roads to the site (and the possible construction of new roads and/or the extension of existing roads, which can take into account the same aspects suggested for waste-to-energy plants) would also make it possible to minimise vehicular impact on the area.

H – Minimum technical standards for the construction of composting plants and characteristics of the compost

The situation in Italy

In this case too, the Italian source chosen is the 27/7/84 Resolution of the Inter-Ministerial Committee, implementing DPR 915/1982, which introduces technical standards for composting processes and defines the characteristics of the compost.

Compost is a product obtained from a biological, aerobic or anaerobic process:
- of the organic component of solid urban waste
- of natural fermenting organic materials or a mix of the same with sludge deriving from the purification of residential wastewater.

The composting process adopts the following rules:
- at the thermophilic stage, the fermenting organic material must remain at a temperature no lower than 55° for at least three days
- fertilising mineral elements cannot be added to the compost before distribution

The characteristics of the compost: these are determined by limits of acceptability in terms of their agronomic characteristics, as shown in the table below:

Parameters	**Unit of measurement**	**Limits of acceptability**
Inert materials	% dry matter	< o = 3
Glass (sieve)	Mm	< o = 3
Glass (quantity)	% dry matter	< o = 3
Plastics	% dry matter	< o = 1
Ferrous material	% dry matter	< o = 0.5
Humidity	% dry matter	< o = 45

Organic matter	% dry matter	< o = 40
Unified matter	% dry matter	< o = 20
C/N ratio		< o = 30
Total nitrogen	% dry matter	< o = 1
P2O5	% dry matter	< o = 0.5
K2O	% dry matter	< o = 0.4
Granulometry	Mm	0.5 / 25

Maximum limits are also provided in terms of environmental protection:

Parameters	**Unit of measurement**	**Limits of acceptability**
Salmonella	N/50 g	absent
Semi infesting	N/50 g	absent
pH	unit of pH	6 / 8.5
Arsenic	mg/kg dry matter	10
Cadmium	mg/kg dry matter	10
Chromium III	mg/kg dry matter	500
Chromium VI	mg/kg dry matter	10
Mercury	mg/kg dry matter	10
Nickel	mg/kg dry matter	200
Lead	mg/kg dry matter	500
Copper	mg/kg dry matter	600
Zinc	mg/kg dry matter	2500

Compost can be used as a correcting element in respect of the maximum limit of 30 tonnes per hectare of agricultural land per three-year period.

The Resolution also indicates the following limits:

Parameters	**Maximum concentrations in the soil (mg per kg of dry soil)**	**Maximum quantities applicable (g per hectare and per annum)**
Arsenic	10	100
Cadmium	3	15
Chromium III	50	2000
Chromium VI	3	15
Mercury	2	15

Nickel	50	1000
Lead	100	500
Copper	100	3000
Zinc	300	10000

Limits for the use of compost are also established according to the type of soil, stating that the compost cannot be used:

- in ground where fruit is currently growing after flowering starts and in any case in the three months preceding crop harvesting
- in fields, pastures and woods
- in soil with pH below 6
- in fields under vegetables and hay in the last two months before sowing/planting
- for artificial forage crops in the last two months before planting
- on timber crops for industrial destinations, in timber-producing forestry during the preparation of parks, playing fields, gardens, etc. without preliminary tilling of the soil and interment

Comparison with the situation in Myanmar and possible elements to integrate

The Burmese sources that we are aware of do not contain minimum technical standards for the production and use of compost. It is therefore to be hoped that standards similar to those outlined above can be introduced, initially as municipal byelaws.

As already highlighted in previous sections, the introduction of said technical parameters presupposes the existence of an entity that deals with the authorisations and periodical checks, with both the authority and the expertise necessary to collect, verify and process the data.

The introduction of a similar standard would have consequences on the way contracts to private suppliers are managed.

The long-term perspective

In the longer term, if a policy of attention to the surface water and crop water table could be implemented in Myanmar, the agronomic quality limits of the compost should take into account the possibility that certain pollutants can pass from the compost to the soil and from here to the surface or underground water.

What is more, a more urbanised context cannot fail to consider that the aerobic or anaerobic degradation of large quantities of organic waste have a considerable smell, and in future it will be necessary to draft technical standards that define minimum air capture efficiency requirements in the places where processing and purification are carried out to eliminate unpleasant smells.

In this case too it might be useful to study the access roads to the plant.

I – Hospital waste management procedures

Hospital waste must be managed in order:

- to decrease the hazard level
- to encourage reuse, recycling and recovery
- to optimise its collection, transport and disposal.

For every type of sanitary waste it is first necessary to describe the waste, classifying it with the correct EWC code.

The relevant Italian standard is Presidential Decree (DPR) no. 254/2003.

It is also necessary to define methods for:

- packaging in the place of production (*laboratory or department*)
- collection and handling inside the health centre
- external transport
- final disposal.

For the classification of waste using the EWC codes we refer you to section "C".

Sanitary waste

DPR 254/2003 regulates the following types of waste:

a) non-hazardous hospital waste; (e.g. EWC: 180104, 180101, 180102);
b) sanitary waste similar to urban waste;
c) non-infectious hazardous hospital waste;
d) infectious hazardous hospital waste;
e) hospital waste that requires particular disposal methods (e.g. EWC: 180103*, 180202*)
f) waste from exhumation and disinterment, and waste from other cemetery activities, excluding plant waste from cemetery areas;
g) special waste, produced outside healthcare structures, with a similar risk to that of infectious hazardous waste.

We will analyse the issues regarding waste classed in categories a) to e) of the preceding list in greater detail, as their production is directly linked to healthcare structures.

1. Non-hazardous hospital waste
   - unused sharps
   - empty medicine containers
   - infusion solutions
   - paper sheets
   - empty infusion bags

A special in/out register is envisaged for this waste and its transport must be accompanied by an FIR form (*see section "D"*), because, as it originates from healthcare structures and is produced in large quantities, it must be considered special waste not similar to urban waste.
This waste must be disposed of by authorised firms, but not by the public system.

2. Sanitary waste similar to urban waste
   - residues from meal preparation (catering structures)
   - residues from meals consumed, excluding those from infectious wards

- disposable clothing
- orthopaedic plasters
- sanitary pads and nappies

This waste is entirely similar in quality and quantity to urban waste, although it comes from sanitary structures, and its disposal follows the same route as urban waste; some can be collected separately and recycled (food waste, paper and cardboard, plastics, glass and metal).
No form of registration is envisaged for this waste, nor is any specific transport document required.

3. Non-infectious hazardous hospital waste
    - laboratory waste (solvents, reagents, mixtures).

Like non-hazardous hospital waste, an in/out register is necessary for this type of waste and its transport must be accompanied by an FIR form (see page 9) because, as it originates from healthcare structures and is produced in large quantities, it must be considered special waste not similar to urban waste.
This waste must be eliminated by authorised firms, but not by the public system.

4. Infectious hazardous hospital waste
    - material that has come into contact with secreted or excreted body fluids (even from the laboratory) such as blood, urine or faeces

In view of their specific hazardous nature and because these materials are certainly infected or presumed to be infected, all the caution indicated for hazardous sanitary waste applies: the obligation for registration and transport with an FIR form therefore applies.

5. Sanitary waste that requires particular disposal methods
    - laboratory animals
    - non-recognised organs and anatomical parts
    - narcotics.

In view of their specific level of danger and because they are infectious, all the caution indicated for hazardous hospital waste applies: the obligation for registration and transport with an FIR form therefore applies.
What is more, temporary storage in the place of production cannot exceed 5 days, except in particular situations (quantities below 200 litres) when it can be as long as 30 days.
In all cases, transport and disposal is performed by authorised firms, by incineration. If the waste-to-energy plant for urban waste is used, the hazardous sanitary waste must be fed in directly at the mouth.

Hospital waste that requires particular processing, downstream of packaging in the place of production, is as follows:
1a) expired or unusable drugs;
1b) cytotoxic and cytostatic medicines for human or veterinary use and visibly contaminated materials that are generated by their manipulation and use;
2) unrecognised organs and anatomical parts;
3) small laboratory animals;
4) narcotics and other psychotropic substances.

The principal treatments for hospital waste are.

Disinfection and sterilisation

The waste is disinfected at the packaging stage, before it leaves the place where it was produced.
This treatment uses the following substances: glutaraldehyde, ortophenylphenol and lysoform or, only in cases of incineration, hypochlorite.
Infectious hazardous hospital waste is sterilised in authorised plants outside the health structures.
The effectiveness of the sterilisation process must be verified and certified.
The sterilisation plants undergo appropriate periodical checks by the relevant authorities.
Sanitary waste that has been sterilised does not need to be incinerated.

Storage and collection

Storage and collection need appropriate suitable disposable packaging, bearing the words "Infectious hazardous hospital waste".
Sharps and infected matter must be collected in special cardboard containers, with click fastening, folding lid and irreversible lock.
In this case, the packaging must be contained in another external package with the words "Infectious sharp, cutting hazardous hospital waste".
Infectious hazardous hospital waste must be stored in conditions such as not to cause alterations that entail a risk for health and must not exceed 5-30 days from the moment the container is closed.

Disposal of infectious hazardous hospital waste

Infectious hazardous hospital waste that has not been sterilised must be eliminated by incineration in authorised plants.
Hazardous sanitary waste that poses a risk of infection can be eliminated:
• in urban waste incinerators and special waste incinerators.
• in dedicated incinerator plants.

It is also important to regulate the way hazardous hospital waste is loaded into incinerator plants:

- this waste must be introduced directly into the furnace, without first being mixed with other categories of waste.
- however, at the mouth of the furnace, it can be loaded simultaneously with other categories of waste.
- the waste must be loaded into the furnace without direct manipulation of the waste, to prevent any risk of infection to the operators.

Comparison with the situation in Myanmar and possible elements to integrate

In the light of the information acquired during the missions and meetings with the PCCD, hospital waste is regulated by specific procedures in the city of Yangon.

The introduction of more restrictive procedures regarding the management of this waste and the adoption of new processes such as sterilisation or inertialisation, could have positive effects in the long term:

- on the working conditions of staff
- on the safety of human beings and animals
- on emissions into the atmosphere

These standards should already be incorporated into the byelaws of the City of Yangon, what is more, by exploiting the city's ministerial role, there might also be benefits at state level.

J – Soil quality

The situation in Italy

The TUA provides the maximum parameters to assess soil quality, known as "Contamination Threshold Concentrations", which determine when a site should be considered contaminated and thus to be subjected to decontamination.
The thresholds differ depending on the use of the soil, as shown in the following table.

Contamination threshold concentration in the soil and subsoil referred to the specific use of the sites to be decontaminated	Public and private green sites and residential sites (mg kg-1 expressed as ss)	Commercial and industrial sites (mg kg-1 expressed as ss)
Inorganic compounds		
Antimony	10	30
Arsenic	20	50
Beryllium	2	10
Cadmium	2	15
Cobalt	20	250
Total chromium	150	800
Chromium VI	2	15
Mercury	1	5
Nickel	120	500
Lead	100	1000
Copper	120	600
Selenium	3	15
Tin	1	350
Thallium	1	10
Vanadium	90	250
Zinc	150	1500
Cyanides (free)	1	100
Aromatic fluorides	100	2000
Benzene	0.1	2
Ethylbenzene	0.5	50

Styrene	0.5	50
Toluene	0.5	50
Xylene	0.5	50
Summation of aromatic organics	1	100
Polycyclic aromatics (1)		
Benzo(a)anthracene	0.5	10
Benzo(a)pyrene	0.1	10
Benzo(b)fluoranthene	0.5	10
Benzo(k,)fluoranthene	0.5	10
Benzo(g, h, i,)terylene	0.1	10
Chrysene	5	50
Dibenzo(a, e)pyrene	0.1	10
Dibenzo(a, l)pyrene	0.1	10
Dibenzo(a,i)pyrene	0.1	10
Dibenzo(a,h)pyrene	0.1	10
Dibenzo(a,h)anthracene	0.1	10
Indenopyrene	0.1	5
Pyrene	5	50
Summation of polycyclic aromatics	10	100
Cancerogenic chlorinated aliphatics (1)		
Chloromethane	0.1	5
Dichloromethane	0.1	5
Trichloromethane	0.1	5
Vinyl chloride	0.01	0,1
1,2-Dichloroethane	0.2	5
1,1 Dichloroethylene	0.1	1
Trichloroethylene	1	10
Tetrachloroethylene (PCE)	0.5	20
Non cancerogenic chlorinated aliphatics (1)		
1,1-Dichloroethane	0.5	30
1,2-Dichloroethylene	0.3	15
1,1,1-Trichloroethane	0.5	50
1,2-Dichloropropane	0.3	5

1,1,2-Trichloroethane	0.5	15
1,2,3-Trichloropropane	1	10
1,1,2,2-Tetrachloroethane	0.5	10
Cancerogenic halogenated aliphatics (1)		
Tribromomethane (bromoform)	0.5	10
1,2-Dibromoethane	0.01	0,1
Dibromochloromethane	0.5	10
Bromodichloromethane	0.5	10
Nitrobenzenes		
Nitrobenzene	0.5	30
1,2-Dinitrobenzene	0.1	25
1,3-Dinitrobenzene	0.1	25
Chloronitrobenzenes	0.1	10
Chlorobenzenes (1)		
Monochlorobenzene	0.5	50
Non cancerogenic dichlorobenzenes (1,2-dichlorobenzene)	1	50
Cancerogenic dichlorobenzenes (1,4 - dichlorobenzene)	0.1	10
1,2,4 -trichlorobenzene	1	50
1,2,4,5-tetrachloro-benzene	1	25
Pentachlorobenzene	0.1	50
Hexachlorobenzene	0.05	5
Non chlorinated phenols (1)		
Methylphenol (o-, m-, p-)	0.1	25
Phenol	1	60
Chlorinated phenols (1)		
2-chlorophenol	0.5	25
2,4-dichlorophenol	0.5	50
2,4,6 – trichlorophenol	0.01	5
Pentachlorophenol	0.01	5
Aromatic amines (1)		
Aniline	0.05	5
o-Anisidine	0.1	10

m,p-Anisidine	0.1	10
Diphenylamine	0.1	10
p-Toluidine	0.1	5
Summation of aromatic amines	0.5	25
Phyto-pharmaceuticals		
Alachlor	0.01	1
Aldrin	0.01	0,1
Atrazine	0.01	1
α-hexachlorhexane	0.01	0,1
β-hexachlorohexane	0.01	0,5
γ-hexachlorohexane (Lindane)	0.01	0,5
Chlordane	0.01	0,1
DDD, DDT, DDE	0.01	0,1
Dieldrin	0.01	0,1
Endrin	0.01	2
Dioxins and furans		
Summation of PCDD and PCDF (T.E. conversion)	1*10-5	1*10-4
PCB	0.06	5
Light hydrocarbons C below or equal to 12	10	250
Heavy hydrocarbons C above 12	50	750
Other substances		
Asbestos	1000	1000
Phthalic acid esters (each)	10	60

Comparison with the situation in Myanmar and possible elements to integrate

The Burmese sources that we are aware not do not contain minimum technical standards for soil quality.

As a result we believe it would be desirable:

- to gradually include parameters regulating the maximum values, as a working method and to manage intervention
- to immediately include the prohibition to leave waste on the ground, to abandon it or to inter it in places or facilities not specifically identified.

In the medium term, we believe it is essential to regulate underground deposits of hydrocarbons (diesel, petrol) and all underground tanks larger than 1 cubic metre and which contain, or have contained, hazardous substances.

As we have seen in other sections, the inclusion of these technical parameters presupposes the existence of entities with both the authority and the expertise necessary to detect, measure, assess and process the data collected.

It is also necessary to define soil sampling and analysis methods, so that the reference to the legal limits is unambiguous, as well as shared methods of verifying the integrity and absence of leaks from interred tanks.

K – Air quality

The situation in Italy

In this case too, the Italian source chosen is not the most recent, but the one deemed most suitable to provide elements for implementation: DPR 203/88.
This standard was subsequently assimilated into the TUA.

DPR 203/88 regards:

a) all the plants that can generate emissions into the atmosphere;
b) the class of fuels and their uses;
c) the maximum limits and reference values for air pollutants in the outside environment and the related sampling, analysis and assessment methods;
d) the limits for polluting emissions and related sampling, analysis and assessment methods.

DPR 203/88 obliges newly-built and existing plants that generate emissions into the atmosphere to apply for authorisation before they are completed.

This application must include a short description of the facility's production cycle, the technologies put in place to prevent pollution, the quantity and quality of the emissions and the deadline for full operation.

Final authorisation will be granted after compliance with the requirements contained in the temporary authorisation (granted either before the construction of the plant or to an existing plant) has been verified (on the spot, near the facility).

An amendment to the authorisation must be requested:

a) if substantial changes are made to the plant which entail qualitative and/or quantitative changes in the polluting emissions;
b) if the plant is transferred to another location.

The DPR also makes it possible for the competent authority to carry out all the necessary inspections inside plants to verify respect of the limits set in the authorisation.

Non-observance of the limits and requirements may lead to closure of the plant, to arrest and to a fine.

These measures can be adopted for the operation of an existing unauthorised facility, for the operation of an existing plant whose authorisation has been suspended refused or revoked, or after a plant has been ordered to close.

As for the presence of pollutants in the air (typically in the urban environment) the DPR indicates maximum limits that must not be exceeded for any of the substances that are considered most hazardous for human health, such as lead, dust, nitrogen oxides and sulphur oxides.

The maximum limits that must not be exceeded are as follows:

Pollutant	Maximum limit	Period of reference
Sulphur dioxide (SO_2)	Median of average concentrations over 24 hours for one year: 80 µg/m^3	April 1 – March 31
Sulphur dioxide (SO_2)	98^o percentile of the average concentrations over 24 hours for one year: 250 µg/m^3	April 1 – March 31
Sulphur dioxide (SO_2)	Median of average concentrations over 24 hours measured during the Winter: 130 µg/m^3	October 1 – March 31
Nitrogen dioxide (NO_2)	98^o percentile of the average concentrations for 1 hour measured during the year: 200 µg/m^3	January 1 – December 31

All necessary measures to prevent these values from being exceeded must be put in place.

Where sampling methods are concerned, the standard regards:

- lead
- particles suspended in the air.

1 – lead

The filter must have an efficiency of no less than 99%, capturing all particles with an average aerodynamic diameter of 0.3 µm at the nominal speed used for sampling.
The efficiency of the sampling is determined by the relationship between the mass concentration of particles in the air collected by the filter and the concentration in the atmosphere.

The efficiency of a sampler must not fall below the following values:

	Size of the particles (aerodynamic diameter)	
Wind speed	5µm	10µm

2 ms – 1	95%	65%
4 ms – 1	95%	60%
6 ms – 1	85%	40%

The sampling intake flow must be kept constant for the entire sampling period, within 5% of the nominal value.
The samplers must be positioned so that they are representatives of each area of the territory.
Sampling must not be interrupted.
An average annual value is only valid if sampling has been performed each month for a minimum of fifteen days. The annual value is calculated by dividing the sum of the valid daily values by the number of days in which valid values have been obtained.
The relevant method of analysis is spectrometry by atomic absorption.

Comparison with the situation in Myanmar and possible elements to integrate

The Burmese sources that we are familiar with do not contain technical standards regulating emissions released into the atmosphere or air quality. It is therefore to be hoped that standards similar to those expressed above can be introduced, initially as a municipal byelaw.

The issue is touched on in the *Environmental Conservation Law* (arts. 7-d, 7-j and 10-d), where the Ministry for the Environment is given responsibility for defining quality standards and rules for emissions.
However, the introduction of these technical parameters presupposes the existence of an entity responsible for issuing authorisations and for periodical checks, with both the authority and the expertise necessary to collect the data.
This entity could be set up within the PCCD, which would acquire authority, functions and specific competence.

The long-term perspective

<u>Emissions discharged into the atmosphere</u>
In future, in order to contain the emissions released into the atmosphere, as envisaged by Leg. Decree 152/2006, it is to be hoped that an AIA (Integrated Environmental Authorisation) may be introduced, a special permit that regulates with a single authorisation both the environmental aspects of the emissions discharged and dispersed into the atmosphere and the systems necessary to abate the same.

<u>Air quality in towns</u>
Monitoring ambient air quality and respect of the limits set is generally more complex and costly than monitoring the emissions discharged into the atmosphere.
In any case, having considered the negative consequences for the health of the inhabitants of Yangon (including all the other towns in Myanmar) and therefore for healthcare costs in the country, it is to be hoped that the authorities will understand that a city with several million inhabitants must face up to the problem of containing the atmospheric pollutants deriving from anthropic activities, such as vehicle traffic, particularly if these are generated by an obsolete vehicle fleet and/or the use of highly polluting fossil fuels in small or large industry, particularly if located in an urban area.

For this reason, in order to guarantee control of air quality and the related mitigation, we reiterate that it would be necessary to create a control structure comprising specialist technicians to monitor meteorological and climatic parameters and ambient air quality, also with responsibility for proposing atmospheric pollution containment policies to the government authorities.

L – Quality of underground water

The situation in Italy

The TUA sets the following "Quality objectives" for the environment:
1. identification and classification of underground water bodies
2. assessment of the chemical state of the water bodies using "standards of quality" and "threshold values"
3. combatting the increase in pollution
4. drawing up qualitative and quantitative monitoring programmes.

Causes of underground water contamination.
The contamination of underground water is due primarily to agricultural and industrial sources and to sewage systems that are insufficient (septic tanks) or not correctly maintained (leaks along the pipe line).
Leaching into underground water is the natural destiny of the local and widespread dispersion in the soil and subsoil. The result is to alter the chemical quality of underground water, and even to inhibit or limit its legitimate use.
The slow process of renewal of this water (generally in proportion to its depth), is confirmed by the results of periodical monitoring.

Definition of the resource. The protection of the sources of provisioning.
All water is a public good and represents an irreplaceable resource, to be used rationally and according to criteria of solidarity.
Use of the water must safeguard the expectations and rights of future generations to exploit an integral environmental heritage.
Use of the water must aim to save and renew resources in a manner that does not prejudice the water heritage, the livability of the environment, agriculture, fauna, aquatic flora and hydrogeological balance.
The use of water for human consumption is a priority. Uses other than human consumption are permitted inasmuch as water resources are sufficient and provided its quality is not compromised.

It identifies:
The obligation of entities not responsible for the contamination to intervene.
Procedures to increase safety, and for environmental decontamination and reclamation can however be activated on the initiative of the competent authorities, when they are not responsible. The owner/proprietor or other parties involved has the capacity to intervene voluntarily at any time to undertake the decontamination necessary in the context of the site owned or occupied.

Checks.

The completion of decontamination work is ascertained by the relevant authority by suitable certification, on the basis of a technical report prepared by the local branch of ARPA (Regional Agency for Environmental Protection).

Census and register of sites to be decontaminated.
The regional governments prepare a register of the sites that are the subject of decontamination, which must contain:

a) the list of the sites that have undergone decontaminated and environmental reclamation, including an indication of the measures put in place on the sites;
b) identification of the entities responsible for the decontamination (e.g. the owner of the area)

Sites of national interest.
For the purposes of decontamination, sites of national interest can be identified on the basis of the characteristics of the site, the quantity and hazardous nature of the pollutants present, and the impact on the surrounding environment noted in terms of health and ecological risk, and the threat to the cultural and environmental heritage.

Parameters of maximum limits.
Italian legislation envisages a list of pollutants to be measured by chemical analysis of the underground water.
This list is contained in the following table:

Contamination threshold concentration in underground water	Maximum value (μ/l)
METALS	
Aluminium	200
Antimony	5
Silver	10
Arsenic	10
Beryllium	4
Cadmium	5
Cobalt	50
Total chromium	50
Chromium (VI)	2
Iron	200
Mercury	1
Nickel	20
Lead	10
Copper	1000
Selenium	10

Manganese	50
Thallium	2
Zinc	3000
INORGANIC POLLUTANTS	
Boron	1000
Free cyanides	50
Fluorides	1500
Nitrites	500
Sulphates (mg/L)	250
ORGANIC AROMATIC COMPOUNDS	
Benzene	1
Ethylbenzene	50
Styrene	25
Toluene	15
Para-Xylene	10
POLYCYCLIC AROMATICS	
Benzo(a) anthracene	0,1
Benzo (a) pyrene	0,01
Benzo (b) fluoranthene	0,1
Benzo (k,) fluoranthene	0,05
Benzo (g, h, i) perylene	0,01
Chrysene	5
Dibenzo (a, h) anthracene	0,01
Indeno (1,2,3 - c, d) pyrene	0,1
Pyrene	50
Summation	0,1
CANCEROGENIC CHLORINATED ALIPHATICS	
Chloromethane	1,5
Trichloromethane	0,15
Vinyl chloride	0,5
1,2-Dichloroethane	3
1,1 Dichloroethylene	0,05
Trichloroethylene	1,5

Tetrachloroethylene	1,1
Hexachlorobutadiene	0,15
Summation of organohalogenates	10
NON CANCEROGENIC CHLORINATED ALIPHATICS	
1,1 – Dichloroethane	810
1,2-Dichloroethylene	60
1,2-Dichloropropane	0,15
1,1,2 – Trichloroethane	0,2
1,2,3 Trichloropropane	0,001
1,1,2,2, - Tetrachloroethane	0,05
CANCEROGENIC HALOGENATED ALIPHATICS	
Tribromomethane	0,3
1,2-Dibromoethane	0,01
Dibromochloromethane	0,13
Bromodichloromethane	0,17
NITROBENZENES	
Nitrobenzene	3,5
1,2 – Dinitrobenzene	15
1,3 – Dinitrobenzene	3,7
Chloronitrobenzenes (each)	0,5
CHLOROBENZENES	
Monochlorobenzene	40
1,2 Dichlorobenzene	270
1,4 Dichlorobenzene	0,5
1,2,4 Trichlorobenzene	190
1,2,4,5 Tetrachlorobenzene	1,8
Pentachlorobenzene	5
Hexachlorobenzene	0,01
PHENOLS AND CHLOROPHENOLS	
2-chlorophenol	180
2,4 Dichlorophenol	110
2,4,6 Trichlorophenol	5
Pentachlorophenol	0,5

AROMATIC AMINES	
Aniline	10
Diphenylamine	910
p-toluidine	0,35
PHYTO-PHARMACEUTICALS	
Alachlor	0,1
Aldrin	0,03
Atrazine	0,3
alpha – hexachlorohexane	0,1
beta – hexachlorohexane	0,1
Gamma - hexachlorohexane (Lindane)	0,1
Chlordane	0,1
DDD, DDT, DDE	0,1
Dieldrin	0,03
Endrin	0,1
Summation of phyto-pharmaceuticals	0,5
DIOXINS AND FURANS	
Summation of PCDD, PCDF (TEF conversion)	4*10-6
OTHER SUBSTANCES	
PCB	0,01
Acrylamide	0,1
Total hydrocarbons (expressed as n-hexane)	350
Para-phthalic acid	37000
Asbestos (fibres A > 10 mm)	to be defined

Comparison with the situation in Myanmar and possible elements to integrate

The Burmese sources that we are aware of do not contain minimum technical standards for surface water quality.
In view of the morphological fabric that the city of Yangon is a part of, it is to be hoped that parameters for the maximum values can be introduced, even gradually, and that an accurate census can be programmed of the water bodies and abstraction points from deep and surface water tables, but also of the points where wastewater from civil or industrial sites is discharged into the soil (via septic tanks).

The matter is also touched on in the *Environmental Conservation Law* (arts. 7-d, 7-j and 10-b), which makes the Ministry for the Environment responsible for defining quality standards and rules for emissions.
However, the introduction of similar technical parameters presupposes the existence of an entity with both the authority and the expertise necessary to measure, assess and process the data collected.

M – The quality of surface water

The situation in Italy

The Italian source chosen is Law 319/76 which regulates how water is protected against pollution.

First of all the Law requires that a census be made of all water bodies, noting:
- the hydrological, physical, chemical and biological characteristics
- all the ways they are used

Special authorisation is required for manufacturing plants to discharge into surface water or sewers; this is obtained from the relevant authorities, whereas no authorisation is necessary for residential sites.

There are also forms of discharge from commercial sites (for example hotels, supermarkets and hospitals) that are similar to residential wastewater and may be discharged without authorisation. Values for acceptance at final treatment plants are defined for discharge from commercial sites and must be respected when the wastewater is discharged.

For discharge into surface water, measurements must be carried out immediately downstream of the point where the wastewater enters the receiving body.

For discharge into a sewage system, the measurements must be carried out immediately upstream of the point where the wastewater enters the public sewage system.

If the maximum limit is exceeded, the authorities can take the necessary measures to reinstate the conditions contemplated by law.

The maximum limits contemplated for discharge into surface water are more restrictive than the limits for sewage systems. This distinction is made because they presuppose the existence of a treatment facility connected to the sewer itself, which is able to improve the concentrations of pollutants present in the wastewater and to bring them below the legal limits.
The values in column A refer to wastewater discharge into surface water from new manufacturing sites, whereas those in column B refer to discharge into sewers from new manufacturing sites and discharge from manufacturing sites in existence when the law came into effect.

Parameter	Concentration	
	A (in surface water)	B (in sewers)
pH	5.5-9.5	5.5-9.5

Temperature ^{o}C	Waterways: not above 3 ^{o} variation compared to average Lakes: not above 30^{o} Sea: not above 35^{o}	Waterways: not above 3 ^{o} variation compared to average Lakes: not above 30^{o} Sea: not above 35^{o}
Colour	Imperceptible	Imperceptible
Smell	Not irritating	Not irritating
Gross materials	Absent	Absent
Sedimenting materials ml/l	0.5	2
Total materials in suspension mg/l	80	not more than 40% of the upstream valu
BOD^5 mg/l	40	not more than 70% of the upstream valu
COD mg/l	160	not more than 70% of the upstream valu
Total toxic metals and non-metals As-Cd-Cr (VI) Cu-Hg-Ni-Pb-Se-Zn	3	3
Aluminium mg/l as Al	1	2
Arsenic mg/l as As	0.5	0.5
Barium mg/l as Ba	20	
Boron mg/l as B	2	4
Cadmium mg/l as Cd	0.02	0.02
Chromium III mg/l as Cr	2	4
Chromium VI mg/l as Cr	0.2	0.2
Ferro mg/l as Fe	2	4
Manganese mg/l Mn	2	4
Mercury mg/l Hg	0.005	0.005
Nickel mg/l Ni	2	4
Lead mg/l come Pb	0.2	0.3
Copper mg/l Cu	0.1	0.4
Selenium mg/l come Se	0.03	0.03
Tin mg/l come Sn	10	
Zinc mg/l come Zn	0.5	1
Total cyanides mg/l CN-	0.5	1
Active chlorine mg/l as Cl_2	0.2	0.3
Sulphides mg/l as H_2S	1	2
Sulphites mg/l as SO_3	1	2
Sulphates mg/l as SO_4	1000	1000

Chlorides mg/l as Cl-	1200	1200
Fluorides mg/l as F-	6	12
Total phosphorus mg/l as P	10	10
Ammoniacal nitrogen mg/l as NH_4+	15	30
Nitrous oxide mg/l as N	0.6	0.6
Nitric oxide mg/l as N	20	30
Animal and vegetable fats and oils mg/l	20	40
Mineral oils mg/l	5	10
Phenols mg/l as C_6H_5OH	0.5	1
Aldehydes mg/l as H-CHO	1	2
Aromatic organic solvents mg/l	0.2	0.4
Nitrogenous organic solvents mg/l	0.1	0.2
Chlorinated solvents mg/l	1	2
Surfactants mg/l	2	4
Chlorinated pesticides mg/l	0.05	0.05
Phosphorated pesticides mg/l	0.1	0.1
Toxicity test	24 hours survival of 50% of the animals (Salmo Gairdnerii Rich)	24 hours survival of 50% of the animals (Carassius Auratus)
Total coliforms MPN/100ml	20000	20000
Faecal coliforms MPN/100ml	12000	12000
Faecal streptococci MPN/100ml	2000	2000

Discharge from residential sites can always be discharged into sewers.
The Law envisages a charge for the collection, purification and discharge of wastewater, made up of:

- a quota for management of the sewage service
- a quota for the purification service.

Comparison with the Burmese situation and possible elements to integrate

The Burmese sources we are aware of do not contain minimum standards for the quality of surface water. It is to be hoped that parameters for industrial discharge may be introduced gradually, together with plans for a census of water bodies.

As mentioned in the previous point, the matter is touched on in the *Environmental Conservation Law* (arts. 7-d, 7-j and 10-b), where the Ministry for the Environment is made responsible for defining quality standards and rules for emissions.
Article 55 of YCDC *Notification 10/1999* expressly refers to the standards that the *Committee* must define for water discharge, and to the obligation to purify the discharge.

However, the introduction of these parameters presupposes the existence of an entity with both the authority and the expertise necessary to measure, assess and process the data collected.

The long-term perspective

In order to preserve underground and surface water it is important to programme and construct an extensive sewage system to collect residential and industrial wastewater and one or more wastewater treatment facilities (purification plants) that can treat wastewater arriving from the sewer before it is released into the environment.

It will also be necessary to carry out a census of water bodies, constant chemical-physical monitoring of the bodies most affected by pollution and strategic from the perspective of consumption and consumption levels.

The launch of decontamination programmes for the most contaminated sites will be the natural consequence.
What is more, as mentioned earlier, it is to be hoped that the AIA (Integrated Environmental Authorisation) can be introduced in future, standardising in a single document even the environmental aspects related to wastewater management (with related limits on the discharge and consumption of water resources) and to the protection of underground and surface water.

This authorisation has a limited duration, at the end of which an application for renewal must be presented with sufficient notice.
For industrial districts that are located in the same area, it might be advisable to consider the creation of purification plants in partnership that can treat the water from individual manufacturing plants, before they are released into the surrounding water bodies.
And finally, Leg. Decree 152/2006 introduces a new concept, which could be adopted as the goal of further long-term improvements, based on establishing a series of initiatives to understand the quality of the water bodies and their use, and then to authorise any discharge into said receiving bodies.

N – Checks and authorisations

The situation in Italy

In this case too, the Italian source selected is DPR 915/1982, which contains a general standard regulating checks on waste management.

The Decree states that the authorities competent to check how waste is managed are authorised to perform:

- inspections
- checks
- sampling

inside plants, systems and firms that:

- produce
- transport

- treat
- store waste (provisionally/definitively)

The proprietor of the plant, system or company is obliged to:
- provide all the information requested by the entity performing the checks
- provide an annual report on the quantities of waste produced, transported, stored and/or processed, to the authority granting the authorisation.

Each of the activities connected to waste management presupposes an authorisation, which must be requested from the competent authority before the activity is begun.

In detail, where the disposal of toxic/hazardous waste is concerned, DPR 915/1982 envisages the following:
- collection and transport: the suitability of the vehicles used for the type of waste transported must be demonstrated
- temporary storage: the suitability of the site and equipment/containers for the type of waste stored/deposited must be demonstrated
- treatment: the suitability of the site, equipment and treatment processes must be demonstrated
- definitive storage: the suitability of the site, equipment/containers and preparation of the land must be demonstrated

Authorisation applications must indicate:
- the maximum quantities to be stored (*for temporary/provisional storage*)
- the maximum quantities to be processed every year (*for processing*)
- the location and boundaries of the area, the types and maximum quantities of waste that can be stored (*for definitive storage*)
- the precautions to be taken during the operation and after the closure of the plant
- the maximum duration of the plant
- the covering method
- the interval between the covering and re-use of the area
- possible uses for the area after the closure of the site

as well as precise indications about the technical equipment, facilities, risk containment and plans for reclamation at the end of the activity, as specified by the Interministerial Committee Resolution of 27/7/84.

As we will see in the appropriate section, the authorising body is the Regional government, whereas the Provincial government carries out the checks, supported by other instrumental entities.

Comparison with the situation in Myanmar and possible elements to integrate

The Burmese sources we are aware of do not contain minimum technical standards for the construction and management of landfill sites.
The 2012 *Environmental Conservation Law* mentions the possibility that certain categories of companies, whose activities can impact on the environment, may be obliged to request authorisation from the Ministry (article 21).

Articles 27 and 34 of YCFC *Notification 10/1999* respectively envisage the possibility of the Committee performing checks on industrial companies and plants, and the obligation for companies to provide an environmental protection plan before the activity starts.

It is therefore to be hoped that regulations similar to those referred to above can be integrated and introduced, even as municipal byelaws.

However, the inclusion of these technical parameters presupposes the existence of an independent entity responsible for the authorisations and periodical checks, with both the authority and expertise necessary to measure, assess and process the data collected.

The Yangon City Council, through the PCCD, is responsible for planning, creating (contracting) and managing the integrated urban waste system.
"Third parties" also contribute to these activities, in other words, *collecting shops* on one hand and contractors responsible for constructing and in some cases also for managing the facilities on the other.

One first suggestion might be to create an office, inside the PCCD, specifically to plan the integrated system and to design services equipped with the tools and expertise necessary to perform:

- inspections
- checks
- sampling
- analyses

This entity could:

- authorise designs for new plants, or at least play an obligatory and binding consultative role
- periodically check the facilities
- envisage checks on the temporary or permanent storage, collection, transport and final delivery of the various producing or intermediate entities in the management of non-domestic waste
- envisage a sector responsible for relations with the general public, which can receive, assess and verify any reports regarding environmental pollution

In time, the acquisition of instruments, means and expertise (*even with the assistance of Universities and the Ministry for Higher Education*), the authority of the PCCD could grow proportionally. In this sense, the Yangon municipal byelaws could expressly envisage the creation of departments, sectors or dedicated offices and laboratories to sample and analyse the waste and environmental matrices affected during their period of management.

Obviously regulating the activities of a similar entity within the PCCD or YCDC, could also involve the central government and act as a stimulus for the creation of a national waste management system based on:

- procedures to authorise the conservation, collection, transport and processing (recovery and/or disposal) of all types of waste
- an indication of the maximum values permitted for the soil and water, as a cut-off for its reclamation

- an indication of the maximum limits permitted for emissions into the atmosphere, soil and water
- possible entities competent to perform inspections, sampling and analysis
- sampling and analysis procedures

O – Taxation

The situation in Italy

The basic criteria for taxation, correlated to the delivery of a public service of urban and similar waste collection and urban hygiene are present in both the TUA (art. 238) and the recent Stability Law for 2014 (*state document for the country's financial stability*).

The condition is the ownership or possession (*in any capacity and for any use*) of closed premises or open areas that can produce urban waste.

The taxpayer is therefore the user, and not necessarily the proprietor.

The tax is a set charge, in other words it represents the total cover of the cost of a specific public service (*in the case in point, the management of solid urban and similar waste*).

Italian legislation has gradually imposed the total cover of the cost of the service, definitively confirmed by the 2014 Stability Law mentioned above.
The total cost to be covered includes:
- the amortisation of works and vehicles
- investments and loans
- the operating costs for men and vehicles

Italian municipal councils approve the charge to cover the waste collection and urban hygiene service approved by the budget, drafted in the basis of the cost of the service defined with the *service provider (AMIAT SpA for Turin)*.

We can now consider the parameters on which the charge for the individual taxpayer is calculated.

They are:

a) the surface area of the real estate

In Italy this refers to the ground space of the areas liable to produce urban waste.

For the party liable to produce special waste, on the other hand, producers can obtain a reduction or exemption, but they are obliged to see to its disposal at their own expense. In order to obtain the reduction of/exemption from the charge, every producer must present to his own municipal authority the annual MUD declaration (*see the detail on page 9*) of activities to dispose of/recover his special waste.

b) the average quantity and quality of waste produced

Some municipalities, relying on analytical studies, manage to precisely measure the waste produced by individual categories of producers, for example:
- stalls for stable outdoor sale of fruit and vegetable

- closed shops selling shoes and leather goods
- cinemas and theatres
- hotels
- stadia
- domestic consumers from 1 to… 6 persons
- etc.

In this way, in addition to a fixed charge due to cover general services, individual producers will be able to pay a lower charge, based on the waste actually produced, although it is calculated on the basis of the category they belong to.

c) the types of activity performed

The reasoning connected to the type of activity performed is included in the study of individual categories carried out by the municipality

d) the income indices (possibly)

Some municipalities can decide that certain producers of waste should pay more than others because of their higher income.

Because of the total cost of the service, the town councils are responsible for establishing parameters/coefficients for each category of producer, to be multiplied by the units of area liable to produce urban and similar waste.

Comparison with the situation in Myanmar and possible elements to integrate

According to information in our hands, the current tax system in Yangon is based on ownership of real estate property, not linked to the surface area but to the district in which it is located.
The tax would cover only part of the budget for urban waste management, approximately 1/4 of the budget.

The suggestions regarding taxation are subject to <u>at least</u> two conditions:

- that the city of Yangon intends to cover a larger share of the total cost of the service with specific taxes or charges
- that the city of Yangon intends to link the tax to elements such as the surface area (envisaging the creation of a real estate databank) and the quantity/quality of waste produced.

It might be useful to introduce these principles initially as Municipal Byelaws, albeit very gradually.

P – Recovery of hazardous waste

The situation in Italy

Ministry for the Environment Decree (DM) 161/2002 identifies some types of hazardous waste and illustrates how to recover them, indicting the result for their subsequent sale.
A list of different types of waste follows.

1. NON-FERROUS METALS

1.1 Type: waste comprising non-ferrous metal oxides which may or may not be mixed with iron oxides and other minor oxides.

Characteristics of the waste and maximum level of hazardous substances:
solid waste, even in powdered form, made up primarily of non-ferrous metal oxides mixed with other minor oxides, in pellets, containing:

- copper up to 10%
- lead up to 70%
- zinc up to 65%
- Cd < 8%, Sn < 20%, Cl < 20% of dry matter
- alkaline-earthy oxides of Na, K, Ca and Mg < 5% for each element.

Recovery activities: recovery of zinc, lead and copper by heat, hydrometallurgical and electrochemical treatment, after possible chemical and physical washing [R4].
Characteristics of the raw materials and/or products obtained: zinc, lead, copper, their alloys or oxides in the forms usually marketed.

1.2 Type: dust and scraps containing copper

Characteristics of the waste and maximum level of hazardous substances: solid matter and fine and coarse dust containing:

- copper up to 90%
- zinc up to 70%
- Pb < 6%, Cd < 1.5%, Sn < 1.3%, Ni < 0.15%, Cl < 20% of dry matter.

Recovery activities:
a) refineries or secondary smelting foundries [R4];
b) hydrometallurgy to recover metals [R4];
c) zinc heat treatment [R4].
Characteristics of the raw materials and/or products obtained: copper, zinc and their alloys in the forms usually marketed.

1.3 Type: lead dross and foam

Characteristics of the waste and maximum level of hazardous substances: non-ferrous metal scraps with lead base exceeding 65% and containing:

- Sn < 15%, Cu < 0.02%, As < 0.01% mixed with their oxides partially in powdered form.

Recovery activities: recasting in secondary lead metallurgy.
Characteristics of the raw materials and/or products obtained: lead in the forms usually marketed.

1.4 Type: exhausted and scrapped lead batteries and their parts

Characteristics of the waste and maximum level of hazardous substances: exhausted and scrapped lead batteries and their parts, with a lead content up to 90% and containing:

- Sn < 1%, As 05%, Sb <10%, Se < 0.05%
- aqueous solution of H2SO4 < 25%
- Pb < 1%. Cd < 0.1%, Cu, Zn, As, Sn and Sb < 0.1% for each element.

Recovery activities: recovery of lead-based metal components by heat or hydrometallurgical treatment of lead-based metal components, with pre-treatment of crushing and sieving to separate plastic components; decantation, filtering and/or concentration of sulphuric acid.

Characteristics of the raw materials and/or products obtained: lead and its alloys and diluted solution of sulphuric acid in the forms usually marketed.

1.5 Type: lead foam and oxides and its alloys

Characteristics of the waste and maximum level of hazardous substances: agglomerated solid waste, even in powdered form, with a lead content of up to 95%, and containing:

- Sn <40%, Sb < 30%, Cu < 2%, Zn < 2%, As < 1%, Cd < 0.5%, Na < 30%, with the presence (4%) of inert matter.

Recovery activities: metallurgy to recover lead, smelting and refinement.

Characteristics of the raw materials and/or products obtained; lead and its alloys in the forms usually marketed.

1.6 Type: zinc ferrites

Characteristics of the waste and maximum level of hazardous substances: semi-solid mud or solid waste with a zinc content of 3-18% and lead 3-12% and containing:

- Cu < 1.5%, Cd < 1%, As < 1.9%, Cr < 0.5% of dry matter.

Recovery activities: primary and secondary zinc heat treatment to recover zinc, lead and other metals.

Characteristics of the raw materials and/or products obtained: lead, zinc and their alloys in the forms usually marketed.

2. PRECIOUS METALS

2.1 Type: fixing and washing solutions from photographic and radiographic solutions

Characteristics of the waste and maximum level of hazardous substances: exhausted fixing solutions, washing solutions and water-based (90%) fixer washing solution, containing:

- ammonium thiosulphate 8%
- acetic acid 2%
- Ag 1%.

Recovery activities: electrolytic recovery and subsequent casting of recovered metals.

Characteristics of the raw materials and/or products obtained: silver in bars or granules, silver solutions

2.2 Type: cine-photo-radiography filters (with iron wool)

Characteristics of the waste and maximum level of hazardous substances: paste containing:

- up to 40% Ag
- iron wool with paste containing over 5% Ag.

Recovery activities: pyro-treatment, ash fusion, electrolytic and/or hydrometallurgical refinement; as a total or partial alternative, separation of the silver salts by chemical dissolution.

Characteristics of the raw materials and/or products obtained: silver in bars or granules, silver solutions in the forms usually marketed.

3. CASTING SLUDGE

3.1 Type: aluminium sludge

Characteristics of the waste and maximum level of hazardous substances: sludge containing:

- aluminium granules, foam and dross > 10%
- 10-20% of other metals (soluble Cu < 3.500 mg/kg, Pb < 400 mg/kg, Cd < 15 mg/kg)

- 30-50% of mixtures of metal oxides
- 0-10% of sodium and potassium chloride
- hexavalent chromium absent.

Recovery activities:

a) primary and secondary aluminium pyrometallurgy following grinding with a hammer mill and sieving to separate the aluminium granules, the other metals present and the dust primarily containing aluminium oxide

b) hydrometallurgy using electrolytic cells

Characteristics of the raw materials and/or products obtained: metallic aluminium in the forms usually marketed.

3.2 Type: saline sludge from secondary rotary furnace for aluminium

Characteristics of the waste and maximum level of hazardous substances: dry solid waste in form of inhomogeneous blocks essentially containing:

- 12-16% aluminium granules
- 40-50% sodium chloride salts or sodium and potassium chloride
- 40-50% aluminium oxide
- soluble copper < 4000 mg/kg
- Pb < 300 mg/kg
- Cd < 10 mg/kg
- hexavalent chromium absent.

Recovery activities:

a) primary and secondary aluminium pyrometallurgy following grinding with a hammer mill, sieving to separate the aluminium granules, the other metals present and the dust primarily containing aluminium oxide, and recovery of the sodium chloride salts and sodium and potassium chlorides to be used in the rotary furnace

b) hydrometallurgy using electrolytic cells

Characteristics of the raw materials and/or products obtained: metallic aluminium in the forms usually marketed.

3.3 Type: sludge from non-hazardous Zn metallurgy and Pb

Characteristics of the waste and maximum level of hazardous substances: vitreous matter with a silicon-aluminous matrix containing:

- Fe approx. 30%
- CaO approx. 15%
- Zn < 20%, Pb < 8%, Cd < 0.25%, Cu < 1.4%, As < 0.4%, S < 3%, Cl < 0.05%, Cr III < 0.6%.

Recovery activities: recovery of metals in secondary smelting units

Characteristics of the raw materials and/or products obtained: metals in the forms usually marketed.

4. MUD

4.1 Type: mud and salts with a high copper content

Characteristics of the waste: solid waste or semi-solid mud with a high copper content, containing:

- Pb < 300 mg/Kg
- Cd < 100 mg/Kg
- As < 100 mg/Kg.

Recovery activities: use in the chemical industry to produce oxychlorides and/or copper sulphates by a reaction with chloridric and/or sulphuric acid
Characteristics of the raw materials and/or products obtained: oxychloride and/or copper sulphate in the forms usually marketed.

4.2 Type: semi-solid mud containing lead and sulphur
Characteristics of the waste and maximum level of hazardous substances: semi-solid mud containing, according to its origin:
- lead up to 75%
- S < 7%, Sn < 1%, Sb < 2%, Zn < 10%, Cd < 5%, Cu < 1%, CaO < 2%, A.s < 0.5% of dry matter.

Recovery activities: recovery of secondary lead in the foundry
Characteristics of the raw materials and/or products obtained: lead and its alloys in the forms usually marketed.

4.3 Type: semi-solid mud containing copper
Characteristics of the waste and maximum level of hazardous substances: semi-solid mud containing:
- Copper up to 90%
- Pb < 0.02 %, Zn < 0.02%, Sn < 0.2%, Fe < 0.2% and Mg < 0.05 %.

Recovery activities: extraction with trichloroethylene and centrifuging of the copper dust; recovery in the chemical industry
Characteristics of the raw materials and/or products obtained: copper and compounds in the forms usually marketed.

4.4 Type: semi-solid foundry mud
Characteristics of the waste and maximum level of hazardous substances: semi-solid mud containing:
- Zinc up to 40%
- Lead up to 70%
- Calcium 15-25%
- Cu < 3%, Cd < 1%, Sn < 0.04%, Si < 8%, Cl < 1%, S < 10%.

Recovery activities:
a) recycling in the form of oxides in the primary metallurgy of zinc using pyrometallurgy or hydrometallurgy
b) metallurgy of the primary or secondary heat treatment of lead and zinc
Characteristics of the raw materials and/or products obtained: zinc and lead in the forms usually marketed.

5. INORGANIC LIQUID WASTE

5.1 Type: alkaline solutions containing aluminium oxides
Characteristics of the waste and maximum level of hazardous substances: alkaline solution of aluminium oxides containing:
- Al < 8%
- Cr < 1 ppm, Cd < 1 ppm and Pb <5 ppm.

Recovery activities:
a) recovery of aluminium oxide by dissolution of the waste in a caustic solution [R4];

b) use as a flocculant with an aluminium sulphate base, with a concentrated solution of sulphuric acid [R5].

Characteristics of the raw materials and/or products obtained:

a) aluminium oxide in the forms usually marketed;

b) flocculant with an aluminium sulphate base in the forms usually marketed.

5.2 Type: ferrous sulphate and ferrous chloride solutions; printed circuit etching solutions

Characteristics of the waste and maximum level of hazardous substances: solutions containing:

- H_2SO_4 < 50 g/Kg
- $FeSO_4$ > 100 g/Kg
- HCl < 50 g/Kg
- $FeCl_2$ > 85 g/Kg
- $CuSO_4$ with presence of metallic Cu
- ammoniacal bronze solutions
- copper chloride
- ferric perchlorate

Recovery activities:

a) chemical and steel industry to produce: ferrous oxides and salts, copper and ammonia salts and chloridric acid

b) regeneration of acids and production and regeneration of printed circuit etching solutions

c) use as reagent for the purification of industrial water, if it is free from elements that cannot be abated by the purification plant

Characteristics of the raw materials and/or products obtained:

a) iron oxides, iron salts, copper salts, ammonia and chloridric acid in the forms usually marketed

b) acids for pickling and printed circuit etching solutions in the forms usually marketed

5.3 Type: acid sludge from sulphonation plants, solutions of exhausted H_2SO_4 [060101*].

Characteristics of the waste and maximum level of hazardous substances: viscous liquid with a medium and high content of free or combined sulphuric acid containing:

- 1-4 dioxane < 700 ppm
- Pb < 50 ppm, Cd < 2 ppm, Cu < 10 ppm, As < 0,5 ppm.

Recovery activities: pyroscission with direct heating at T of 1100 C° [R5].

Characteristics of the raw materials and/or products obtained: sulphuric acid solutions in the forms usually marketed.

5.4 Type: exhausted sulphuric acid solutions

Characteristics of the waste and maximum level of hazardous substances: sulphuric acid solutions at 70% with the possible presence of sulphonic acids and sulphates < 5%.

Recovery activities: chemical industry for the production of sulphuric acid

Characteristics of the raw materials and/or products obtained: sulphuric acid in the forms usually marketed.

5.5 Type: waste acid solutions of chloride ions [110105*].

Characteristics of the waste and maximum level of hazardous substances:

- acid solutions with $ZnCl_2$ > 200 g/l
- acid solutions of $FeCl_2$ > 200 g/l
- acid solutions with $NiCl_2$ > 200 g/l
- acids solutions of chromium chloride > 200 g/l

- acid solutions of CuCl2 > 200 g/l.

The solutions contain iron oxide impurities.

Recovery activities: chemical-physical separation of the impurities; separation of the solid particles by vaporisation of the solution to obtain chloridric acid solutions and zinc chloride solutions

Characteristics of the raw materials and/or products obtained: zinc chloride solution and chloridric acid solutions with 24-26% title in HCl in the forms usually marketed.

6. LIQUID WASTE OF AN ORGANIC NATURE

6.1 Type: acetate mother liquor

Characteristics of the waste and maximum level of hazardous substances: mixture of non-halogenated organic solvents containing:

- methyl acetate 70 - 85%
- methyl alcohol 5 - 10%
- isopropyl alcohol 5 - 15%.

Recovery activities: distillation and adjustment to purify individual solvents

Characteristics of the raw materials and/or products obtained: methyl acetate, methyl alcohol and isopropyl alcohol in the forms usually marketed.

6.2 Type: water and DMF solution [070201*].

Characteristics of the waste and maximum level of hazardous substances: aqueous solution at 6.5 < pH < 9, containing:

- N
- dimethylformamide < 30%
- traces of glycols
- dioctyl phthalate
- surfactants, colouring silicon and carboxymethyl cellulose.

Recovery activities: recovery of the solvent by distillation with fractional adjustment.

Characteristics of the raw materials and/or products obtained: DMF with high level of purity in the forms usually marketed.

6.3 Type: exhausted solvents and diluents

Characteristics of the waste and maximum level of hazardous substances:

- solutions made up 80% in weight of solvents or diluents, even chlorinated
- single-component aqueous solutions containing 20% in weight of solvent

These solutions can contain:

- aromatic solvents (e.g.: xylol and toluene) < 50%
- oils or grease and paints < 15%
- Pb < 5,000 ppm, Cu < 500 ppm, Cr < 500 ppm e Cd <50 ppm
- aqueous solutions of isopropyl alcohol with minimum titre of 94%.

Recovery activities:

a) regeneration by distillation

b) direct reutilisation as solvents for uses that demand a lower degree of solvent purity

Characteristics of the raw materials and/or products obtained: solvents and diluents in the forms usually marketed.

6.4 Type: residual solutions of low-boiling chlorinates

Characteristics of the waste and maximum level of hazardous substances: organic solutions based on:

- chloroform < 31%
- 1-2 dichloroethane < 53%
- 1-1 dichloroethane < 19%
- carbon tetrachloride < 22%
- vinyl monomer chloride < 0.9%
- ethylene oxide < 0.3%, ethyl chloride < 3%
- 2 chloropropane < 0,15%
- 1-1 dichloroethylene < 5%
- methylene chloride < 0.5%
- 1 chloropropane < 0.08%
- 1-2 dichloroethylene trans < 4.4%
- chloroprene <0.9%
- 1-2 dichloroethylene cis lt 1.6%
- benzene < 1.8%
- 1-1-1 trichloroethane < 0.1%, trichloroethylene < 0.9%
- 1-1-2 trichloroethane < 1.5%, perchloroethylene < 0.3%
- 1-1-1-2 tetrachloroethane < 0.1%
- 1-1-2-2 tetrachloroethane < 0.03%, pentachloroethane < 0.05%
- containing PCB, PCT = 25 ppm and PCDD = 2.5 ppb.

Recovery activities: production of perchloroethylene and carbon tetrachloride to replace chlorine.
Characteristics of the raw materials and/or products obtained: perchloroethylene and carbon tetrachloride in the forms usually marketed.

7. OTHER WASTE

7.1 Type: exhausted active carbons

Characteristics of the waste and maximum level of hazardous substances: solid granulate with the presence of adsorbed inorganic and organic substances identified as hazardous substances, very toxic, toxic and harmful
Recovery activities: direct regeneration heat treatment. The stocks of exhausted active carbons from different manufacturing processes must be regenerated separately
Characteristics of the raw materials and/or products obtained: reactivated active carbons, can be re-used exclusively in the same or a similar manufacturing process.

7.2 Type: paint sludge

Characteristics of the waste and maximum level of hazardous substances: polyester and/or phenolic resin containing solvents in a minimum concentration of 15%.
Recovery activities: distillation to recover the solvent
Characteristics of the raw materials and/or products obtained: solvents in the forms usually marketed.

7.3 Type: calcium hydroxide

Characteristics of the waste: calcium hydroxide dispersed in water with minimum titre of 30%, pH 10.5 – 12.5.
Recovery activities:
a) neutralisation of acid wastewater or acid solutions

b) pH corrector

Comparison with the situation in Myanmar and possible elements to integrate

The possibility of implementing this type of standard and the speed with which it is done depends on the technical-organisational possibilities of the PCCD and the industries performing this type of activity.

What is more, adoption of the concept of hazardous waste used here presupposes the adoption of a waste classification method based on the TUA, in other words mainly analytically, identifying the specific risks of the waste.

It is however possible that the Yangon City Council may be interested in identifying certain types of immediate interest and in regulating their recovery, in which case the standards summarised here would constitute a starting point.

Section 3 – Intermediate level

The situation in Italy

Italian waste management legislation reflects the administrative structure of the Italian state. Each administrative level has legislative and/or regulatory responsibilities.

There are four administrative levels:

- State
- Regions
- Provinces
- Municipalities

In this section we will discuss the levels below the State and above the Municipalities, the so-called intermediate levels: Regions, Provinces and delegated agencies.

The Regional government (Art. 196 of the TUA) has the power to standardise the integrated waste management system and does so both with laws, by developing a planning tool, known as the "Regional Waste Management Plan" (PRGR), and by controlling the planning activities performed by the Provincial governments, including the "Provincial Waste Management Plan" (PPGR).

To sum up, the Regional government must:

- prepare, approve and update the Regional Waste Management Plan (PRGR) and plans for the decontamination of polluted areas,
- discourage the disposal of unsorted waste;
- promote sorting of urban waste, even hazardous, paying particular attention to the sorting of food waste or with a high level of humidity
- systematically update waste production trends;
- optimise the re-use, recycling, recovery and disposal of waste
- encourage the reduction of waste production and, above all, reduced use of packaging
- encourage the use of goods produced from waste

- define the criteria to identify the locations suitable for landfill sites
- approve designs for new facilities and authorise changes to existing plants, if possible favouring their location in industrial areas
- authorise the performance of operations to dispose of and recover even hazardous waste
- define criteria and procedures for the presentation of financial guarantees to safeguard the correct performance of waste disposal and recovery activities;
- define regulatory schedules, conventions and statutes to be adopted by the catchment Consortia and ATOs;
- grant contributions and incentives to public entities, to simplify the creation and completion of the integrated urban waste management system;
- define the minimum annual quantity of recycled paper that the public authorities must use, even envisaging incentives to encourage the use of recycled material;
- promote educational, training, popularisation and awareness activities, with the goal of spreading correct information about problems and solutions regarding waste and developing a culture of waste reduction and recovery;
- identify forms of administrative simplification for entities and firms that can adopt environmental management systems (certification);
- encourage the development of clean technologies, waste enhancement, the use of recycled material, the reduced output and hazardous nature of waste, complying with the EU 'de minimis' rule.

The goal of the legislation adopted by the Regional government is to:

- execute in its own territory the policies emanated by the central State
- define the various territorial districts, defined as “optimal” (and referred to as ATOs), within which a suitable integrated management system for urban and similar waste must be developed
- programme the design and management of the various facilities that will constitute the integrated waste management system
- envisage the flows of waste that will be produced every year by the various town councils included in each ATO
- programme the flows of waste that the individual facilities listed in each ATO, can treat every year
- envisage the creation of suitable territorial catchments, smaller than the ATO, in which Municipal Consortia can be set up; they will be responsible for programming, and organising competitions to contract out the management and transport of the waste produced by the individual municipalities

The integrated waste management system must respect the principle of self-sufficiency, and therefore envisage all the technical solutions within their organisations which, complying with the relevant national and regional standards, will safeguard the health of the public and respect of the environment: soil, subsoil, air and water.

The necessary condition for a self-sufficient system is the creation of an urban and similar waste collection system that separates at source, therefore before actual collection, all or at least the main recoverable strains.

Having said that, a self-sufficient system is made up of:

- landfill site and/or incinerator (or waste-to-energy plant) => for unsorted urban and similar waste
- pre-sorting plant for unsorted waste if there is no recyclable/recoverable waste collection system in place or the existing system is poor => to avoid wasting the opportunity to recycle/recover materials that can still be used and to achieve the economically sustainable management of the landfill sites or incinerators
- composting unit (based on aerobic or anaerobic technology) to recover organic waste
- treatment plants to recover:
    - paper/cardboard
    - plastics
    - glass
    - aluminium, iron and metals
    - bulky mixed waste
    - etc.

The public sector also relies on the private sector to support the integrated urban and similar waste management system.

We refer to the use of treatment plants for specific types of waste which, although also produced by the general public, is not generated frequently or in appreciable daily quantities, with the result that the annual quantity does not require programming and management by the public sector.

For example, treatment plants for:
- expired medicines
- exhausted batteries
- light bulbs generally
- worn tyres
- electrical and electronic waste
- solvents and paints
- asbestos
- etc.

It is also indispensable that alongside the integrated urban waste management system an integrated system should also be set up to manage hazardous and non-hazardous industrial waste, that is not compatible with the urban waste disposal system.

The so-called intermediate system of sources depends on the activities of the provincial government as well as on those of the regional authorities.

As part of the responsibilities defined by the regional authorities, the provincial authorities must:
- prepare, approve and update the Provincial Waste Management Plan (PPGR), based on the requirements of the PRGR
- play a controlling role for the entire integrated waste management system, including brokerage and marketing of the waste and decontamination of contaminated sites
- identify, within the PPGR and with the approval of the town councils, areas suitable or unsuitable for the location of urban waste disposal and recovery plants, with numerous indications for each type of plant;
- approve the designs and authorise waste disposal and recovery plants;

- adopt provisions for the renewal, injunction, suspension and repeal of authorisations to operate plants, and to perform waste management and use activities;
- manage emergency situations for waste disposal/recovery, finding priority solutions in the relevant region and, on a subordinate level, referring to plants located in other Piedmontese provinces or in other regions;
- promote education, training, popularisation and awareness activities, with the goal of spreading correct information about waste management problems and solutions, and of developing the philosophy of reducing and recovering waste.

The monitoring function is closely linked to precise authorising procedures, which the producers, owners of transport and brokerage companies and treatment plants must respect.

The Provincial authorities are therefore responsible for:
- granting authorisations to perform industrial waste treatment activities
- checking the requirements declared in the authorisation requests in time.

If, during the check, failure to meet the conditions or the presence of conditions other than those declared in the authorisation application is demonstrated, the provincial authorities have a number of tools on hand to limit industrial activities:
- an injunction
- an injunction with temporary suspension of activities
- a repeal of the authorisation to perform the activity

Let us consider the different cases:
- in the first case (injunction) the industrial activities can continue, but the proprietor must bring them into line in due time with the indications of the authorisation
- in the second case (suspension) the industrial activities must cease for a set period (from a few months to 1 year) and, in any case, until it complies as requested
- in the third case (repeal) the industrial activities cease definitively, and may only start again after compliance and a new application for authorisation.

Checks are carried out at companies by specially trained provincial officers or officers from other public organisms collaborating with the provincial authorities, including ARPA (the Regional Agency for the Protection of the Environment). This agency is functionally part of the regional government, but performs its monitoring function in close collaboration with the provincial authorities.

The Provincial government periodically checks:
- the organisations and companies that produce hazardous waste
- the companies that collect and transport waste professionally, paying particular attention to the origins and destination of said waste
- the plants and companies that dispose of or recover waste

Checking staff are authorised to carry out inspections, verification and sampling inside the plants, facilities or companies that produce or manage waste.

Industrial secrecy cannot be used against the checking staff who are, nonetheless, obliged to respect confidentiality under current law.

In addition to the PRGR and PPGR, the integrated waste management system is regulated by regional byelaws.
The 2 most recent regional laws that have modified the relevant legislative context are:

- Regional Law (Piedmont) no. 24/2002
- Regional Law (Piedmont) no. 07/2012

Regional Law 24/2002 envisages the separation of operational roles between:

- parties providing waste collection, transport and urban hygiene services (**the Catchment Consortia**)
- parties developing, contracting and managing final processing plants for waste produced in the territory under its jurisdiction (**the ATO**).

Regional Law 07/2012, on the other hand, considered the unification of all responsibilities under a single entity: **the Committee of Experts**. However, this law has never been implemented, following an administrative objection by the Turin City Council, which was upheld by the Administrative Magistrate.

The system in force is currently the system envisaged by Regional Law 24/2002.

Regional legislation pursues the goal of the most efficient management of waste following criteria and methods inspired by a correct relationship between costs and benefits, and the best protection of the environment.

In addition to the Regional Laws, the PRGR and PPGR both include clauses that define territorial boundaries to create the ATOs and operational tools for the implementation of the integration waste management system.

The PRGR contains:

- an estimate of overall waste production and the forecast target of sorted waste;
- the potential for recovery and disposal already met by existing plants, and the future forecasts for waste to be recovered and disposed of;
- the methodological and technological indications for the structure of the system of plants to deal with urban and similar waste;
- indications regarding the reduction of packaging at source
- the organisation of special waste management and related dedicated plants.

The prescriptions of the PRGR are binding for Town Councils, Consortia, Provincial authorities and other public entities, as well as for public urban hygiene service contractors. The regional plan is updated at least every three years.

In addition to the PRGR, the PPGR contains:

- the breakdown of the province into catchments suitable for waste management
- an identification of areas that are suitable and unsuitable to locate urban waste recovery and disposal facilities;
- a definition of the programmed criteria for the location of special waste disposal plants;
- a definition of the facilities necessary to complement the integrated urban waste management system, the facilities necessary to dispose of special waste in the province

and an indication of the operating times and methods to achieve the goals indicated in the programme.

The PPGR is updated to reflected changes to the regional plan, but can be modified at any time.

As indicated earlier, the ATOs are entities responsible for running the integrated system that manages the waste treatment plants.

In detail, the ATOs are responsible for:
- organising
- contracting
- checking

the various waste treatment services in the territory, even coordinating the municipal Consortia.

To sum up, 2 organisms will be defined, to operate in close functional contact with each other and with the municipalities:

1) the ATO
=> deals with predicting, programming and regulating the flows of waste produced in the territory by domestic and similar users
=> deals with the technical and logistic programming of the facilities
=> deals with the rationalisation of the flows of waste towards the various treatment plants in the territory

2) the Municipal consortium
=> drafts the service Contract for all the following services:
- urban and similar waste collection
- waste transport (to the various treatment plants defined by the ATO)
- urban hygiene
=> awards the services envisaged in the contract by public competition
=> checks on the way the services are managed downstream of the award of the contract
=> sets the charges and sees to their collection
The charges may be set and collected by individual Town Councils, or the Council may delegate their collection to the Consortium.

There are also other entities that perform important roles:
3) the Town Councils (or Municipalities)
=> approve the Service Contract drafted by the Catchment Consortium
=> set the charge on the basis of the financial plans approved by the service providers
4) the parties responsible for the following checks:
- administrative
- accounting
- operating and technical

Comparison with the situation in Myanmar and possible elements to integrate

We reiterate the considerations already expressed in Section “N”.

It is not our intention to suggest adopting the Italian system, but simply to illustrate the entities and roles/responsibilities so as to provide potentially useful elements in the event of a possible reorganisation of the PCCD offices and in relations with third parties (even private).
Both the size of the territory and population and the administrative/ministerial role of the YCDC lead us to suppose a similarity with the ATOs and Catchment Consortia, which are therefore capable of establishing, regulating and organising "integrated waste management".

Section 4 – The municipal level

The management of urban waste collection for the City of Turin is governed by Byelaw 280/2002. This byelaw was issued pursuant to the principles and prescriptions contained in the regional and provincial programme documents: the PRGR and PPGR.

The byelaw comprises 47 articles, divided into 4 Chapters:
Chapter 1: "general principles"
Chapter 2: "collection services"
Chapter 3: "sweeping and ground hygiene services"
Chapter 4: "final principles and penalties"

The key to the byelaw examines 5 issues:

- Principles for urban solid waste management.
- Classification, tracking and assimilation
- The road sweeping service
- Regulation of particular waste-producing activities (e.g. local markets, building sites, etc.)
- Taxation

The articles were examined with the purpose of identifying the elements related to the 5 issues.

Where Myanmar is concerned, there are two byelaws, one that regulates management of the waste produced in the major city, Yangon, and the other that establishes the behaviour the public should adopt, both in their daily lives and in the performance of specific activities.

The first byelaw is Order 3/96 issued by the YCDC – Development Council of the city of Yangon (18/06/96), the purpose of which is to protect the city's green areas, beauty and growing modernity, and to regulate unsuitable behaviour by the general public.

The second is Notification 10/99 of 24/12/99 which contains the rules for the YCDC to guarantee urban hygiene and to regulate collection/sweeping activities.

R – Principles of solid urban waste management.

The situation in Italy

In compliance with national law, the urban and similar waste management service is performed by the Turin City Council **as a monopoly**, through a specific **Service Contract** drawn up with the **service provider**.

The Turin City Council has entrusted the urban and similar waste collection and disposal service to the Amiat S.p.A. company, which is owned 49% by a private partner.

The Byelaw envisages that the Turin City Council must include precise rules in the Service Contract for the waste collection and urban hygiene service, to be met by the service provider/manager (AMIAT SpA); they can be summed up as follows:

- the service provider undertakes to endeavour to reduce final waste disposal in favour of other forms of recovery such as re-use, recycling and the recovery of raw materials;
- in line with the economic resources guaranteed each year by the Turin City Council, the service provider must encourage the development of "door-to-door" waste collection over roadside collection, including experimental forms of collection;
- in line with the economic resources guaranteed each year by the Turin City Council, the service provider must promote the creation of Ecocentres[1] or recycling centres which, in addition to allowing the public to discard materials which cannot be collected on the spot because of their quality or size, or might cause problems to the collection vehicles or to the unsorted disposal system, are an indirect way of raising awareness among the public and educating them about waste sorting;
- the service provider must prepare informative material, and organise social events such as exhibitions, parties, meetings with schools, lectures and debates to promote environmental education.

The service provider is also responsible for:

1) distributing suitable containers for sorted waste collection around the area, which are immediately distinguishable from containers for unsorted waste;
2) guaranteeing the periodical cleansing of the containers (*the frequency with which the containers are washed varies according to the type of refuse contained*)
3) providing the service every day, including night-time work, and envisaging minimum working shifts (*particularly for collection services*) even on public holidays;
4) transporting the waste with suitable vehicles, replacing old vehicles with new ones *(according to a programme envisaged in the contract*), complying with legislation regarding atmospheric and acoustic pollution;
5) removing all waste abandoned in public areas by persons unknown.

With reference to point 5) above, if there are elements among the abandoned waste that make it possible to trace the person responsible for dumping the waste, and if the investigation identifies the person responsible (*who might be the person who materially abandoned the waste or the last person to possess it*), the Mayor will issue a special ordinance asking said person to remove and dispose of the waste, and possibly to clean or reclaim the area.

If the technical surveillance organs note a risk for public health and the environment, the service provider must urgently see to its removal as an emergency measure.

If there is no immediate danger and the person identified as responsible does not arrange its removal, the Mayor will ask the service provider (AMIAT SpA) to deal with the waste on his behalf.

[1] Any urban waste that can cause problems from an environmental perspective if it is disposed of without sorting, and recoverable waste for which no other form of sorted collection exists in the area, must be taken to the Ecocentres and Recycling centres

The Mayor will subsequently charge the cost for removal to the person responsible who, if he does not pay, will be reported to the Judicial Authorities, for a crime that Italian penal legislation defines as “non-observance of an Order from the Authorities”.

The purpose of the legal proceedings is to:
- inflict on the person responsible a fine or detention order
- obtain from the person responsible payment of the cost of the service performed, even by confiscating property belonging to him, which will be sold at auction

In order to improve relations with the public, the service contract envisages that the service provided must acquire 2 important tools:
- the services charter
- the rules for monitoring the service

The service charter is a document that involves the service provider, the Turin City Council and consumer associations, which together represent the interests and expectations of the general public.

The document is important because it defines the correct procedure for requests and reports of poor service by the public to the service provider, and the deadlines by which the service provider must respond to the public.

The monitoring regulations, on the other hand, are approved and entrusted to a third party by the Turin City Council.
This system envisages that the entity responsible for the monitoring service (*currently a cooperative, as part of the goal of promoting employment among the weaker social groups*) carries out checks on the basis of 100 elements indicated by the City Council (Environment Department).

The reports are verified the following month and, depending on the result (*good, average, poor*), a document is drafted about the quality of the services delivered, which is useful to assess possible changes to the services.

If the result is “poor”, the City Council asks for the penalties envisaged by the byelaw to be applied and, every six months it meets the service provider to assess possible counter-arguments and definitively apply the penalties.

Sort your waste has become a password: the Turin City Council has achieved 42% of sorted waste collection, gradually converting part of the roadside service to a **door-to-door** service.

Increased use of door-to-door collection, backed up by a suitable network of recycling centres or **ecocentres** located around the city, has made it possible to boost sorting of various types of recoverable materials and to partially recover the cost of separate collection, thanks to subsequent recovery in a national network of treatment plants.

Sorted waste collection is more expensive than roadside collection, but makes a significant difference, reducing the use of landfill sites and waste-to-energy plants, thus boosting their **sustainability** and increasing recovery of materials.

Domestic waste is in first place among urban waste production. The individual therefore plays an important role, producing, sorting and storing waste in the home, and correctly allocating the domestic waste to bins in the street (street collection) or courtyard (door-to-door).

The Byelaws include a section dedicated to the correct behaviour expected of waste producers, whether private individuals or companies:

- the producer must store his waste and transport it in such a way as to avoid any dispersion or malodorous effect, and also to maintain the various types of waste separate in order to comply with the sorted waste collection implemented in the area
- ditches to preserve organic waste (manure pits) are permitted in agricultural areas
- it is compulsory only to use the appropriate containers/bins, placing the waste in suitable bags
- it is compulsory to deposit the waste inside the containers/bins and to ensure that they can be closed
- in the case of door-to-door collection with bags (in areas where there is insufficient space to position bins/wheelie bins), the bags must be left on the day and at the location and time indicated by the service provider
- for bulky waste, it is possible:
  - to book the free home collection service (max. 5 items)
  - to take it to the city recycling centres or ecocentres
- hazardous domestic waste and electronic waste must not be placed in roadside or door-to-door bins/wheelie bins, but must be taken to the city ecocentres
- it is forbidden to move, tamper with, break or dirty the urban waste containers, or to hang posters or write messages not authorised by the administration
- it is forbidden to park in front of wheelie bins

Comparison with the situation in Myanmar and possible elements to integrate

Here we refer to article 2 of Notification 10/99 issued by the YCDC (Yangon City development Committee), which establishes definitions for the different categories that underpin the service.

Speaking of waste generally, a distinction is made between:

- general rubbish: includes “dirt” and ashes, bricks, engine parts, glass, vegetable waste
- cooking waste
- waste from parks and gardens
- industrial waste (*i.e. materials produced and deposited by industrial companies and workshops*)
- construction waste
- commercial waste
- waste that is hazardous for health (“offensive”): this refers to animal carcases or other putrefying substances
- hospital waste and numerous definitions for burial activities.

Like Italy, the competent authorities (*the reference is to Ministries or “organisations”*) are obliged to provide information for anyone who performs building, commercial or industrial activities, or

who generates hospital waste (*for example chemical waste*), who must then take the appropriate protective measures.

Chapter 5 also gives the YCDC responsibility for preparing directives in specific fields, and for checking industrial activities, hospital activities and other activities that generate potentially hazardous waste.

Another interesting point is art. 14, which contemplates the possibility of entrusting the service to other entities.

The above may be a good starting point in envisaging, even at a regulatory level, the complex urban waste management system, focusing on separating the various classes of waste at source.

Managing the various classes differently, possibly with the support of the private sector where this is useful, would be a considerable advantage. This principle could be incorporated in the city byelaws.

S – Classification and assimilation criteria. Regulating waste producers

The situation in Italy

Regulation no. 280 classifies waste as follows, considering it comparable to urban waste:

- rubbish from road sweeping
- rubbish of any nature or origin, lying on public roads and areas, or on private roads and areas subject to public use, or on river banks.
- bulky waste
- hazardous urban waste
- mixed urban waste (similar to urban but comprising several classes).

In this context it may help to list the different types of sorted collection:

- paper and paper/cardboard packaging
- glass packaging and tins
- plastic packaging
- greenery
- organic waste
- wood, furniture and wooden packaging
- batteries
- expired medicines and syringes
- other sorted waste (*clothing, textiles, iron, metal and mixed bulky items*)
- bulky waste
- electrical and electronic equipment

The sorted waste collection system is backed-up by the recycling centres, where the general public can deposit different classes of waste which are collected separately, even bulky and hazardous items such as solvents, paints, neon lights, computer monitors, etc..

Comparison with the situation in Myanmar and possible elements to integrate

From what we have seen so far, in Yangon waste collection seems to envisage the separation into two types, dry and wet, with green or blue bags.

The public system does not regulate sorted collection of different classes of waste, such as glass, plastic or paper packaging which, like tins, metals, wood and home appliances, the public takes directly to the shops that market them.

This system is economically self-sustainable and also allows a certain amount of employment to develop, but the public system has no control over these activities, neither from an organisational and logistic perspective, nor from the viewpoint of respect of general environmental protection standards, human health generally and occupational health in particular.

Where sorted waste is concerned, the public system, which does not control these activities, cannot calculate precisely the potential economic and environmental benefits of regulating these activities.

It is therefore to be hoped that future legislation will include byelaws to regulate these activities, making checks and surveillance the responsibility of the PCCD.

The following fall into the category of mere economic and political evaluations:

- making a census of all the shops that market waste in the metropolitan area of Yangon
- regulating activities by creating a professional board
- supplying suitable training to individual service providers about the most suitable management standards for the waste they treat and the minimum standards to adopt regarding occupational health and safety
- creating a proper integrated waste management system, where in addition to the shops where hazardous waste is marketed, a system of plants is created to treat the individual materials and rough machining waste right at the shop; this could create jobs and contribute to the development of the economy, not only in the Yangon region but throughout the country.

T – Criteria for the organisation of sweeping services

The situation in Italy

In addition to collection operations, the other activity envisaged by Byelaw no. 280 is **sweeping**, in other words, cleaning and washing the ground, both manually and mechanically.

The manual service consists basically in:

- cleaning the area below the curb (i.e. the gutter)
- emptying the wastepaper bins in streets, squares, parks, gardens, bus and tram stops
- cleaning manhole covers
- removing syringes

As part of efforts to make building owners more responsible, the Turin City Council has created a system of collaboration to keep the pavements clean, with the exception of those in front of public schools in the city and those around public gardens, which are cleaned by the service provider.

The owners or residents, or commercial exploiters of private buildings must arrange for the pavements in front of the buildings to be cleaned. If particularly bulky or difficult to remove waste is abandoned, the service provider will intervene in a spirit of collaboration.

The mechanised service is performed by road sweeping and washing machines, during the day or at night.

The sweeping service also includes the river beds, and areas of the city where refuse is habitually abandoned, or where cleansing operations prove necessary, and children's playgrounds.

In addition to the various types of sweeping, there are activities performed with the goal of maintaining urban hygiene in general, such as:

- street washing (*according to a programme defined in the service contract and renewed every year*)
- pest control in public areas (*streets, public gardens, parks*)
- weed control in public streets (*removal and chemical treatment of roots of weeds that emerge in the soil*). Weed control is not performed on pavements (*another structure of the Turin City Council deals with it*) and if weeds emerge from buildings (*the owner must deal with them*)
- disposal of rubbish abandoned in public areas

Comparison with the situation in Myanmar and possible elements to integrate

Notification 10/99 sets some rules for cleaning the city.

The Council itself is directly responsible for managing the service.

The second Chapter assigns to the Council the task of (regularly) maintaining the rubbish containers, while members of the public are required to throw rubbish in the appropriate place. There is a general analogy with the Italian system of "dual responsibility".

It would be useful to provide more detail about the activities coordinated by the YCDC, similar to Turin's municipal Byelaws.

We also believe that it would be useful if, where already envisaged (*if it is not, we hope it will be as soon as possible*), this can be upgraded/improved with the goal of keeping to a minimum the amount of rubbish dumped in the streets, preventing it from blocking the water drains and making it more difficult/expensive to clean them, with a direct environmental and economic advantage.

U – Regulation of particular waste-producing activities: e.g. local markets, building sites, etc..

The situation in Italy

We have seen that, in general, the byelaws reflect the breakdown of the rubbish to be processed into different classes, as well as whether it is domestic/non-domestic, hazardous/non-hazardous, and the quantities produced.

Another important factor is the **type of activity** that generates the waste.

We believe that it would also be useful for the municipal council of Yangon to regulate some of these activities.

Among other things we underline:

1) building trade: the inert waste deriving from building and demolition work is considered similar to urban waste when it is the product of small domestic maintenance works and does not exceed 80 kg/mq/year.
   On the other hand, building sites produce large quantities of inert materials and waste which is not similar to urban waste and must be transported and eliminated by the producer; this ad hoc standard is quoted in the building byelaws of the Turin City Council
2) the retailer, importer or distributor of batteries must provide a container where the public can discard them, posting a warning to the public where they are sold about the dangers and damage to the environment and to human health of discarding the batteries outside the appropriate containers
3) pharmacies are provided with special containers for expired medicines and syringes by the service provider
4) sorted collection systems are provided for second-hand clothing, shoes and handbags, with specific roadside containers
5) a system is put in place to collect the organic garbage from local markets and wood and plastic packaging (*crates and bags*)
6) exhausted toner and printing devices are collected in offices (*collection is free from public offices*)
7) on the occasion of celebrations, festivals, sporting or cultural events in streets, squares and other public areas or areas used by the public, the organisers must communicate the programme to the Environment Department at least ten days in advance. The organisers must keep the area clean and tidy. If they do not intend to arrange for cleaning themselves, they must enter into a contract with a private operator or with the public service provider.

Comparison with the situation in Myanmar and possible elements to integrate

Art. 29 of Chapter 5 ("Protection of the environment") of Notification 10/99, provides a general definition of industrial and manufacturing activities, and specifies that the YCDC can direct the proprietor of a company or whoever occupies public ground with its businesses (commercial and manufacturing), to immediately transport any waste that might cause environmental pollution elsewhere (the destination is not specified).

Article 34 envisages that whoever wishes to set up a business that could have consequences in terms of environmental pollution must submit the business plan to the YCDC and can only launch the activity after having received approval.

These rules are an excellent starting point for the creation of an extensive system of preventive control before and in the course of industrial and entrepreneurial activities in general.

As indicated previously, one suggestion is to create a system coordinated by the YCDC and/or PCCD that envisages the following:

- a general census of the current state of the industrial and business panorama, for all activities that could have an impact in terms of the production/management of waste or even only of the potential risk of pollution of the environmental elements (soil, water, air)
- entities competent to assess authorisation applications for the creation of new waste treatment facilities (landfill sites, incinerators, recovery plants for specific classes of waste) or new businesses that deal with waste management, collection and/or transport
- entities competent to perform checks and inspections of businesses and industrial companies
- entities competent to demand the adoption of adjustments and changes, and the temporary suspension or cessation of activities
- planning in time and in the territory of the integrated management of all the waste produced, by domestic and non-domestic consumers
- planning in time and in the territory of an integrated system of facilities, not necessarily managed directly by the public system
- the planning, even with the involvement of private operators, of suitable environmental awareness and education campaigns, with different targets and approaches, from children to young people, students, families and economic operators

V - Taxation

The situation in Italy

For the legislative framework we refer you to section “O”. Here we examine some peculiar aspects of the municipal byelaw (no. 210 of 1994).

The byelaw indicates the general reference criteria for:

- the definition of the taxable areas
- the charges to apply for the management of urban waste produced by public premises and the occupation of public areas and areas of public use

Where companies are concerned, whoever launches an activity destined to occupy premises and public areas must actively communicate the start of activities to the Turin City Council. This is done by respecting precise timelines, because the conditions for the application of the charge start from the date of the communication.

It is also necessary to communicate the cessation of activities when the reason for the occupation of the public land or premises terminates. If, after the cessation, it emerges that the taxpayer has already paid more than necessary, he will be repaid the amount corresponding to the services not yet provided.

The municipal authority has the power to carry out all the verification and checks in the manner and form considered most effective and opportune to identify all the parties obliged to pay the charge, and also has the power to check the declared data.

The following may be requested:

- data and information
- copies of deeds and declarations
- plans of the premises with details of the surface area and measurements (in square metres); to this end the premises and areas may be inspected, to directly verify the surface area and its use
- the qualitative-quantitative characteristics of the waste produced

The taxpayer or the proprietor of the property may be summoned to provide clarification or proof.

The Byelaw also lists the possible of exemptions, which include:

- real estate property used for residential housing, without furniture and ornaments, not connected to the public network services;
- cellars and attics, if not inhabited or inhabitable;
- heating units and utility rooms set aside for technological systems, such as electrical control rooms, lift shafts and silos, where there is usually no human presence;
- terraces and balconies.

Special cases of exemptions or reductions are also contemplated:
total exemptions

- premises and areas of the City of Turin used as institutional premises and managed directly;
- individuals who receive welfare benefits from the City authorities to supplement their income

partial exemptions:

a) 10% for homes whose sole occupant is less than 65 years old;
b) 10% for homes kept available for seasonal use or other limited and discontinuous use,
c) 10% for the residential part of rural constructions occupied by a farmer;
d) 20% for uncovered premises and areas set aside for public entertainment (such as discos, dancehalls or night clubs)
e) 30% for uncovered premises and areas used for fair and other events.

It is worth considering the **annual reduction in the charge** envisaged for producers of waste similar to urban waste who have privately sent it for recovery or recycling.

The proprietor of the activity that arranges for the recovery or recycling of the waste in question **by private means** in order to take advantage of the reduced charge must apply after the event, at the end of the period that the charge refers to and in which recovery took place; the application must contain:

- copy of the annual declaration single form (MUD)
- copy of all the identification forms signed by the entities authorised to carry out recycling,
- the period in which said operation took place and the quantity of waste recycled.

In these cases, a percentage reduction of the charge or **tax cut** is granted, taking into consideration the incidence of the mass of waste recovered out of the total waste produced and in any case, not exceeding 50% of the tax due.

Comparison with the situation in Myanmar and possible elements to integrate

We refer you to section “O”.