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Focus group 37 - *Zero Waste Design. Design for waste prevention*

Paper *A Network of Museums and Laboratories to explain and promote the concepts of 'Waste Prevention' and 'Waste as Resource'*

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1. The idea

Waste allows us to see our civilisation back-to-front.

If we examine what we throw away (and why, when and how we remove it from our surroundings) we can understand who we are and where we are going.

Starting from refuse, we can reconstruct the development of our civilisation and evaluate our standards of living and margins of survival.

Thinking about the 'end of life' of things has brought about a paradigm shift. This new way of thinking about production and resources is important as our survival depends on our ability to safeguard and generate 'natural capital'.

Our economic system must take sustainability into account so that, rather than producing ever greater quantities of goods, we produce them better so that we enjoy the same standard of living while using less resources and less energy.

Waste must be prevented and reduced; things that are thrown away must be considered secondary raw materials. In fact, in environmental terms, they are the most valuable of materials because:

- ✦ they allow you to reduce the consumption of primary raw materials;
- ✦ most of the energy required for their extraction, processing, preparation and transport is also saved.

Today we should no longer think in terms of waste management but in terms of resources management. 'Zero waste' means both the optimization of our use of natural capital and the transformation of waste into resources. **This is the vital paradigm shift.**

A number of promising legislative developments have been brought about in this field by the European Parliament and by some member states of the European Community.

Municipal waste in Europe constitutes 10% of total waste generated, stabilized at around 520 kg per person per year, but the decoupling of growth / resource consumption from waste generation (provided by the 6th Environment Action Program of the EC in 2002) has been achieved only in part.

Moreover, a sustainable policy cannot settle for the 'decoupling' of use of resources from waste production. 'Decoupling' is a partial objective, but absolute reduction of the use of resources and of waste generation is the strategic aim.

The European Directive approved in 2008¹ opened a new chapter. Its priorities are the prevention of waste, the reuse of waste and the recovery of materials. For the first time definitions relating to the prevention and reuse of waste were introduced.

For once, Italy was able to act within the agreed timescale (by issuing a Legislative Decree²). Today prevention is recognised as a fundamental factor in waste management.

The European Parliament Resolution of 20th April, 2012 specifies the priorities of the 7th Environmental Action Program. This program must set more ambitious targets for waste prevention, reuse and recycling, including a significant reduction in the production of waste. The Commission's initiatives to reduce residue to zero and, by 2020, to exclude everything that can be composted or recycled from incineration have been confirmed.

We need 'anti-waste' policies: we must not think in terms of managing waste, but rather in terms of optimising the use of resources. This can be achieved through an integrated product policy, attention to life cycle (from Life Cycle Analysis to Life cycle Thinking), and the concept of Extended Producer Responsibility.

Waste management must not be limited to collection or treatment, which intervene on refuse, but must include actions on resources, *before* these become refuse:

- agreements and contracts³,
- eco-taxation⁴;
- 'polluter pays' and extended producer responsibility;
- green procurement (in both public and private sectors).

In Italy, even if good practices are increasingly pervasive, public awareness of the need for this paradigm shift has not yet been sufficiently developed. This gave rise to the idea of creating a network of labs and museums about waste.

This network will encourage visitors to adopt an interactive and pro-active approach in order to spread the culture of sustainable waste management. The Scientific Committee, which includes a number of prominent Italian experts in waste and museums, arose as a result of this idea⁵. The Committee contributed to the establishment of the first exhibition

1 Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives Text with EEA relevance *Official Journal L 312*, 22/11/2008 P. 0003 - 0030

2 Legislative Decree n. 205 of 3 December 2010, *Disposizioni di attuazione della direttiva 2008/98/Ce del Parlamento Europeo e del Consiglio del 19 novembre 2008 relativa ai rifiuti e che abroga alcune direttive* – came into effect 25 December 2010.

3 In Italy: Anci-Conai about packaging, WE, etc.

4 Eg.: 'Pay as you throw'.

5 Antonio Cavaliere, Pinuccia Montanari, Stefano Calvillo, Roberto Cavallo, Alessio Ciacci, Anna Colombo, Carlo De Giacomi, Fiorangela Di Matteo, Enzo Favoino, Walter Ganapini, Patrizia Garibaldi, Irene

space in Genoa, and continues to meet in order to develop the network.

2. The first WML exhibition space: The Palazzo Verde Laboratory in Genoa

On 14th May 2010, I submitted the proposal to build a 'Waste Museum'⁶ to the Urban Lab laboratory in Genoa. The project was supported by Renzo Piano (who had already proposed this idea), and by the Mayor Marta Vincenzi. It was given particularly strong support by Pinuccia Montanari, the De-growth chairwoman who, like Beppe Grillo, began to think about the project on a visit to Naples during the urban refuse emergency.

Thanks to the commitment of the director of Civic Museums, Guido Gandino, and to Professor Pietro Ugolini (CRUIE⁷), the city of Genoa was able to acquire funding from the European Community for a speedy implementation of an *Energy and waste laboratory* in Palazzo Verde (situated in Porto Antico, via del Molo 65), which was inaugurated on October 19th, 2011⁸.

Since then, the Palazzo Verde Lab has been managed by LabTer GreenPoint. It currently consists of:

- ♣ a multimedia station about waste and energy on the ground floor;
- ♣ a more in-depth multimedia station with sections on paper, metals, plastic, reuse and residue on the first floor.

In addition to the Palazzo Verde Lab, the Municipality of Genoa has implemented a creative workshop in vicolo degli Angeli and the Factory of the Recycling (a laboratory of reuse).

As well as the daily activities of the Palazzo Verde Lab, a number of special events are scheduled to take place in 2012: an international exhibition on frugal architecture⁹ and a conference about waste and the sea¹⁰ are being planned.

Ivoi, Irene Molinari, Antonio Pastorino, Guido Rossi, Rapahel Rossi, Mario Santi, Giovanna Sissa, Giovanna Sartori, Pietro Ugolini, Federico Valerio, Guido Viale, Luca Zane. And Elena Boschieri, Elisabetta Lodoli, Simonetta Maione, Stefano Piroli.

6 <http://www.urbancenter.comune.genova.it/node/954>

7 <http://www.unige.it/strutture/CRUIE.shtml>

8 <http://www.museidigenova.it/spip.php?rubrique288>

9 Organised by the Zevi Foundation.

10 Proposed by UrbaLab.

3. Development of the project

3.1 *The target*

The project is promoted by the Scientific Committee and other bodies such as the ANCI (institutional) and IRISistema (operational). There are three targets:

1. **Public Administration** (P.A.), responsible for the management of waste, and its associated public companies;

2. **the 'green economy'**, based on Life Cycle thinking.

Consortia and companies that optimize the use of resources and produce less waste by applying extended producer responsibility.

The world of re-use;

3. **Universities**, for practices and research relating to sustainable waste management.

3.2 *The 'candidates'*

Last month's Scientific Committee initiated a number of contacts to create a network of Waste Museums and Laboratories (WML). Currently the following bodies are actively or potentially involved in the project:

✦ Genoa – The Palazzo Verde Lab, which is run independently, has been included in the circuit of Civic Museums.

✦ Turin – The *A come Ambiente* Museum will dedicate an interactive hall to WML in its enlargement program in 2013.

✦ The Province of Reggio Emilia and the University of Modena and Reggio Emilia (UniMoRe) are interested in organising a section of the Museum. They are considering whether to locate it inside the technology centre or in the area of the old incinerator.

✦ The Municipality of Capannori (LU) is planning to include its innovative practices regarding prevention, collection and integrated management *toward Zero Waste* in its technology centre.

✦ The Director of Culture for the Apulia Region is considering WML as the main theme for a scientific, educational and training workshop and is aiming to extend this to the entire museum system of the Apulia Region.

These institutions require funding in order to operate as a network. As well as the establishment of a consortium to apply for research funding, the project requires a management group and a coordinated approach in terms of both image and content of the

exhibition spaces.

4. The method: a widespread WML network to encourage interaction and pro-active participation

As the architect Carlo Degiacomi¹¹ states, a **modern museum of communication and scientific information must be based on interactivity**, in other words the *'ability to be, for visitors, a stimulus to investigate what happens "under their noses", which they would otherwise be unable to see. This ability helps us to interpret the reality of our daily lives to form a different relationship with everything that surrounds us, even to the extent of changing our habits and behaviour. This is how knowledge can lead to action.'*

The Museum must propose a sequence along which different types of display are presented using technologies that allow the visitor to interact and obtain answers to his or her questions.

Technological and sensory stimuli are used to ensure that the visitor is immersed in an emotional experience (intellectual knowledge is better absorbed and remembered when our emotions are involved in the learning process). The kind of exhibition can be set up in a limited space, requiring a room rather than an entire museum or gallery. Visitors can enjoy them as a group, with individuals taking turns at playing the active protagonist, and qualified guides will be on hand to answer any questions visitors may have.

5. Basic requirements

5.1 A coordinated image for the project (Trashosaurus/Recyclosaurus?)

This project requires a unifying image to identify the various points of the network.

Two ideas:

a) the construction of *trashosauruses*, visually symbolizing the weight of waste that each of us produces every a year – a monster hanging over our heads.

This idea was inspired by the installation greeting visitors at the entrance to The Trash Museum in Connecticut.

11 Director of *A come Ambiente* Museum in Torino.

The artist Serge Van de Put¹² created the trashosaurus *Hugo* which – as shown in the photo –



welcomes visitors to the entrance of the Palazzo Verde Lab¹³, Genoa.

b) the creation of a recyclosaurus¹⁴ whose image represents the reduction of waste and the growth of recycling schemes (the trend toward 'zero waste').

5.2 Historical and anthropological considerations

In the past, Man would return organic materials to the earth where they were reinstated in natural cycles.

Waste arose when Man produced and accumulated non-degradable refuse.

Industrial production takes resources from the 'natural capital' but does not reinstate them, thus creating an acceleration of the system's entropy.

Waste was, at first, considered to be a misuse of resources: something to be avoided.

However, it was not given due importance because the 'natural capital' of raw materials and energy was thought to be infinite.

In economic terms waste was considered to be 'externalities', to eliminate in the cheapest way, preferably without even appearing in company accounts.

Over time, the imbalance between the regenerative capacity of nature and the material dimension of the economy has increased. To help to counter this phenomenon, Extended Producer Responsibility has been applied: the producer has to consider each and every cost connected to the production of goods, even those related to the depletion of natural capital and end-of-life costs: reuse / recycling or disposal.

12 Habitual collaborator DUMPING ART from the landfill to recycle: art for the protection of the environment - <http://www.arteliergenova.eu/>

13 <http://www.museidigenova.it/spip.php?article739>

14 Concept by Federico Valerio.

Today we must try to stop the cycle of production / consumption / scrap and return to a zero-waste system.

In the meantime the cost of collection and disposal of urban waste were often borne collectively, and not by those who produce and distribute goods.

Waste management and waste treatment in particular became an industry in themselves. The waste disposal business was gradually infiltrated by criminal elements who offered solutions that were cheaper but more environmentally destructive.

The term 'refuse' has a negative sense, referring to the social quality of a thing, a person, or a situation. Refuse suggests the desire to exclude or eliminate something because it is superfluous and unacceptable – surplus, residue, waste: morally reprehensible.

Illegal waste disposal and its subsequent damage to the environment and health have strengthened the negative perception of the term 'waste'.

This disapproval and fear make it easier to say "Not In My Back Yard!" than to discuss the nature of waste and ways of preventing it.

For this reason it is extremely important to discuss waste in terms of its economic value.

Today we are at the end of a cycle, both economically and culturally.

Many people have lost faith in liberalism and commercialism.

They were global totems that became a 'dominant ideology'.

But the financial crisis in 2009 (and its subsequent effects on the real economy: recession and mass unemployment) did not merely end a phase, it destroyed the foundations of that 'creed'. Today it is increasingly obvious that an economy based on consumerism and speculation can be easily undermined.

However, an alternative to this system is becoming increasingly popular: an economy based on fair trade that reduces the number of middlemen and increases the value of locally produced, high quality products.

This economy questions the established concept of waste.

A compatible economy:

- ✦ Takes into account the finite quantities of energy and material resources, through eco-planning and eco-design compatible with their limits;
- ✦ uses concepts such as 'ecological backpack', life cycle of goods, eco-design for processes and products that can be free of packaging and waste;
- ✦ works towards zero waste in industrial production;
- ✦ is a system making use of salvaged materials and products.

The initiatives of reuse (clothing, furniture, computers, household appliances, and using non-marketable foods for social catering) are important factors in this economy.

They are of particular interest to the 'third sector': voluntary organisations and social cooperatives which provide financial and material assistance.

There is also the commercial aspect of second-hand goods which is an important market during a period of crisis.

In short, refuse can reveal a great deal about how human societies lived in the past and how they live today. Waste is also a fundamental axis in the debate regarding production, consumption and relationships. We could even base our hope for the future on this paradigm shift.

5.3 The heart of the WML system: an interactive exhibition space focusing on the sustainable management of waste and its connection with local laboratories

The heart of the WML system is an **interactive multimedia space** incorporating innovative communication technology.

Depending on the resources available, the exhibition can occupy one or more spaces (such as the rooms of a Museum).

The basic module consists of three parts.

The first part is a **historical** sequence in which the considerations referred to in the previous paragraph are developed with text, images, music, and dialogue.

The second part develops the discourse on **sustainable management of natural capital**, referring to the need to optimize the methods with which energy and raw materials are obtained and the need to extend the implementation of sustainable waste management (waste prevention and reduction and the use of waste as a resource).

Concepts such as ecological backpack, illegal landfills, LCA, eco-design, etc. can be presented in texts, images, interactive multimedia, and multi-sensory laboratories,.

The third part develops the **three areas of waste management: prevention / collection / treatment**, through texts, images, and activities that encourage the visitor to take a proactive stance.

The three aspects require:

- clearly written texts explaining what prevention, collection and treatment are and why

they should be integral parts of waste management (bibliographic links to further in-depth studies should also be included);

- an example of good practice and links to further examples.

(These practices may change as methods evolve);

- a constantly updated map of the territory consisting of a series of 'snapshots' of waste management as it moves towards Zero Waste; what, how and where it is possible for waste to be prevented, reduced and reused; the waste collection scheme; how and where waste is recycled, **composed**, retrieved and disposed of.

An area should be reserved to describe the problems caused by illegal dumping.

This territorial map will show the progress of local waste management towards sustainability.

The WML system needs investment and management to make it feasible at national and/or regional levels.

The headquarters could be based in Genoa where the first Waste Museum was opened, or in another city such as Turin where the *A come Ambiente* Museum is well established.

Then there could be a network of regional centres.

These installations must become the centre of the **existing** territorial network of didactic laboratories. These Labs will act as 'wide area' museum explaining and promoting the culture of sustainable waste management.

The labs will organise visits to the principal regional or national centres and will receive materials, links, suggestions and initiatives to circulate and promote good practices that allow the sustainable management of waste (towards zero waste) at regional or national level.

Central locations (regional, national) and local laboratories must all interact with authorities, operators and other who play a part in the cycle (industrialists, resellers, schools, environmental groups) to design and manage the development of territorial maps. They offer educational and communicative support to this process and help to define and update the maps.

In this way, the WML network project (central and 'wide area') helps to guide the evolution of the territories to a more sustainable waste management, toward Zero Waste.

5.4 Other possible elements

Other elements can be built using the basic module, with the same interactive approach to encourage proactive behaviour. They will be chosen according to available resources and interests of the local and central partners.

As a starting point a number of mature themes, for which there are several examples of good practice, can be illustrated:

- ⤴ prevention and waste minimization and introduction of sustainable energy at home and in the office;
- ⤴ the organic fraction, the key to integrated waste management
- ⤴ packaging and recyclable dry refuse
- ⤴ WEEE
- ⤴ alternative recycling systems
- ⤴ The green economy of reuse, energy optimisation and zero waste...

6. Expanding the Network

6.1 The De-growth Conference as an opportunity to develop the network

Our conference, which brings the subjects of ecological sustainability and social equity to Venice, is the ideal occasion in which to present the project and develop the idea of the WML network.

Each participant can develop the project in an original way that reflects their social, economic and environmental context.

The conference also provides the opportunity to form a network.

It will be interesting to meet again at the next conference to discuss the development of the project, to present new ideas, and to assess its ability to reflect and promote the evolution of waste management – or rather, *resources* management – into a sustainable use of natural capital.

The WML network can act as an indicator of the paradigm shift and as a point of contact for anyone who would like to participate in this experience, be they from Italy or from abroad. A dedicated website will be activated and accessible through the RifiutiLab portal¹⁵, in the meantime please send any queries to my personal email address

¹⁵ <http://www.rifiutilab.it/>

(rifiutologo@hotmail.it).

6.2 A scientific meeting in Reggio Emilia for the development of the project

The Department of the Environment of the Reggio Emilia Provincial Authority¹⁶ and the University (UniMoRe) will organise a conference on the WML network project, in Reggio Emilia this autumn.

The conference will provide an important opportunity to study the contents of the project in greater detail and to discuss the progress of the initial participants and the ways they can work together.

7. An idea for the project launch and management scheme

An original and innovative project and a valid business plan are requisites in proposing a new kind of museum.

7.1 Project launch partners

The Scientific Committee is looking into the resources necessary for the launch of the WML network in a number of important areas (investments, management costs, revenues that contribute to paying the costs). At the same time, it is also trying to form a group of partners to implement a project on sustainable waste management, at both national and international levels.

Contact has been made with the following potential partners:

- ✦ ACR +¹⁷
- ✦ Aica¹⁸
- ✦ Eurocities and its Waste Management group
- ✦ Italian national coordination Agendas 21
- ✦ CRUIE
- ✦ the 'candidates' referred to in paragraph 3.2
- ✦ *A come Ambiente Museo* in Turin¹⁹
- ✦ IRISsitema

¹⁶ <http://www.provincia.re.it/page.asp?IDCategoria=703&IDSezione=3674&ID=215575>

¹⁷ <http://www.acrplus.org/>

¹⁸ <http://www.assaica.org/ita/index.php>

¹⁹ <http://www.museoambiente.org/>

✦ RifiutiLab²⁰

The CRUIE, under the direction of Professor Peter Ugolini, has been chosen by the Scientific Committee to act as project leader to obtain European funding.

7.2 *A project management scheme*

The *A come Ambiente Museo* could serve as a model for a project management scheme²¹, especially for the way the museum covers its costs (1/3 direct income, 2/3 from membership fees).

A WML network Association could have private and public shareholders: it could be an association of public administrations, universities and private entities such as companies, consortia, trade associations and foundations.

A 'Friends of MWL network' club could be established, possibly by the local environmental labs, to ensure that the network acts as a thriving and active community open to proposals that could be handled by a dedicated website.

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²⁰ <http://www.rifiutilab.it/>

²¹ <http://www.museoambiente.org/soci.php>