

LAYMAN'S REPORT



A new integrated system to reduce waste
by medical equipment and medical WEEE

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In recent years, waste is becoming more and more a very important issue and a matter to be faced by institutions, firms and civil society. Part of these waste comes from discarded medical equipment (WEEE) which, despite representing a small share in percentage terms, have a significant environmental and economic impact.

THE CONTEXT

Disposal of medical equipment generally occurs because, these have come to the end of their useful life, or because they are defective or obsolete according to the adopted health standards or still uneconomical in their maintenance. Once the product has reached these features, it is necessary to define a method to dispose of it.

There are different opportunities to dispose of medical equipment:

- the supplier of medical devices, which provides the new equipment, withdraws the old one;
- disposal as waste by a supplier, often paid by the healthcare facility;
- donation to humanitarian or charity organizations, with the aim of being re-used in underdeveloped or developing countries;
- sale of used medical equipment.

The main problems identified in this process are:

- lack of standard procedures for the management of discarded medical equipment from medical institutions;
- poor waste prevention and scarce re-use of discarded equipment (often still working);
- lack of preventive and specific assessment and characterization of waste before disposal.

It is therefore extremely important to conduct the process of medical equipment disposal effectively, in order to reduce its overall impact and improve management sustainability of electrical and non-electrical medical equipment.

The criteria used to choose how to allocate discarded medical equipment are related to several factors; the main factors are: the state of discarded medical equipment, the existence of a market for used equipment, legislative restraint, the existence of a trust relationship with humanitarian or charity organizations.

The chosen alternative results in a direct impact from the economic, social and environmental point of view, not only on health facilities but also on the surrounding environment. In some cases, the impact is very different from what expected: see the medical devices donated to developing countries, that often are still good working for a limited period of time, thus rapidly becoming waste (World Health Organization, 2001), or the fact that the decision on how to allocate the equipment, in many cases, is unfortunately postponed indefinitely, leaving the equipment unused in a warehouse.



THE PROJECT

The Life-MED project, Medical Equipment Discarded, presented in Life+2013 aims at studying and realizing a new integrated management and improvement system of discarded medical equipment from hospitals, medical and veterinary clinics, such as equipment, plants, devices, software and home-care equipment. The activities started in July 2014 until June 2017, for a period of 36 months, in Italy and Romania.

Project objectives:

Research and suggest alternative solutions in lieu of the immediate disposal of discarded medical equipment, through the development of circular economy practices, thanks to a method of preparation to recycling and regeneration.

What has been done to address this problem?

PREVENTIVE ACTIONS

Cognitive investigation in the management of discarded medical equipment in Italy and Romania: the practice commonly used in the management phases of discarded medical equipment have been analyzed in order to understand the critical aspects of the management system but also the potential reduction of waste production. Some examples have been used to study the most relevant information and to validate the existing data.

As starting point, a screening action has been conducted on healthcare institutions, that dispose medical equipment, in order to create a net with institutions, that could be interested in the project and the implementation of collaboration agreements.

Subsequently, an analysis was made to define precise scientific criteria necessary for an exact characterization of medical equipment as waste,

since first the category of waste it belongs to has to be defined, in order to be able to correctly manage transport, recovery and disposal of the equipment.

Once stated identification criteria, there has been an analysis of the method used by healthcare facilities to manage medical equipment they decided to dismiss.

IMPLEMENTATION ACTIONS

Le attrezzature, qualora non vengano destinate If the equipment is not arranged for a free hand over, it is always managed as waste. The system implemented by Life-MED, was introduced at this cast off stage, proposing two possible paths for such equipment:

- **Disposal** through CAUTO (Cantiere autolimitazione), a social cooperative authorized to manage WEEE and in particular equipment belonging to the 8th Category of 2012/19/EU Directive, or medical devices (excepted implanted and infected products) such as: nuclear medicine equipment, radiotherapy, cardiology and dialysis, analyzers, freezers, fertilizer tests, other equipment for diagnosis, monitoring and curing diseases, injuries or disabilities. CAUTO works according to WEEELABEX standards (Waste Electrical and Electronic Equipment – Label of Excellence), established in the framework of LIFE programme + WEEE forum. In line with the above mentioned parameters, CAUTO subscribes a subsidy contract with institutions dealing with disposal of medical waste.
- The **free hand over** of medical equipment, within the integrated system is carried out through Medicus Mundi Attrezzature, which performs all phases from the recovery of the equipment to the preparation for re-use. Discarded medical equipment represent a unique opportunity to offer cheap technologically appropriate and compatible equipment to healthcare facilities in eastern Europe and charities within the EU, while maintaining equivalent work standards. The Life-MED program promotes specific

procedures to manage the free hand over process and identifies a suitable system to enable re-use.

Medicus Mundi Attrezzature deals with free hand over procedures within western Countries, while Ateliere Fara Frontiere cooperative deals with free hand over to eastern Europe, in addition to this, they verify the adequacy of the equipment in relation to the context and real needs.

In Italy took place a National working table of consultation for the definition of guidelines for the management of discarded medical equipment. Opportunities and problems of the current legislative process are identified and possible solutions are put forward for a better and more efficient application.

It has been decided to involve various national institutions and consortia working in the waste management sector in order to compare the results of the project, define common procedures and collect proposals for a legislative simplification or modification.

The subjects involved in these activities have been:

- the Italian Ministry of the Environment and Protection of Land and Sea,
- Lombardy Region (Regione Lombardia), DG Environment e DG Health,
- CONAI (Consorzio Nazionale Imballaggi),
- WEEE Coordination Center,
- National Associations of Clinical and Healthcare Engineers,
- Universities specialized on the sector.

After these meetings the guidelines for a better management of discarded equipment have been drafted and there has been a proposal for a parliamentary resolution submitted to the Italian Environment Parliamentary Committee.

The Communication activity had a fundamental role to spread and promote the project and the results achieved during the implementation of the project itself, in particular to meet interested parties and a wider audience at local and European level.

At the beginning of the project a focused communication strategy has been developed to

create a visual identity of the project itself. Promotional materials are realized in a sustainable and ecological way and the texts are in English, Italian and Romanian language. The promotion and spread of the activities have also been realized through information meetings in both Italy and Romania.

The Life-MED website is a great mean of interchange of information, knowledge and opportunities for the re-use of the materials, but also to promote and spread best practices and actions on sustainable use of medical electronic devices.

These information can reach a wide range of people thanks to the creation of a three languages web site: English, Italian, Romanian.

How does the free hand over work?

DONORS

Hospitals, residential or semi-residential socio-medical structures, outpatient and territorial centers, veterinary centers...

- They contact LifeMED to schedule a meeting during which the project will be explained in details.
- An agreement is signed between the medical center and the project reference in Italy (CAUTO) and in Romania (Ateliere Fara Frontiere- AFF) for a specific evaluation of discarded devices and equipment.
- CAUTO and AFF perform the assessment of the equipment, by editing a report to be presented to the medical institution and establishing if the equipment can be regenerated or is considered WEEE.
- When the discarded equipment is repairable and re-usable, it will be transported to the project partners' laboratories, Medicus Mundi (Italy) and AFF (Romania), using appropriate packaging and vehicles.

BENEFICIARIES

Local authorities managing health care and social facilities, religious congregations, professionals, animal reception centers...

- The request adequacy is verified according to the context and the real needs of the recipient.

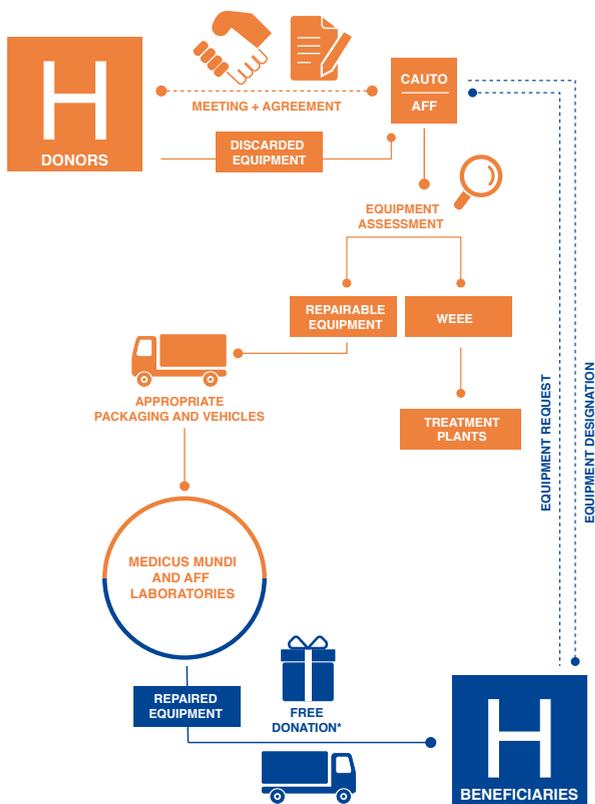
- Identification of equipment and medical devices that will be designated to free hand over, ensuring there is a correspondence between the request and the available equipment.
- In case of identification of a suitable equipment handed over for free, Medicus Mundi and Ateliere Fara Frontiere will visit the medical facility for a test, including an on-site functionality test.

NB The logistic organization of transports foresees specific needs to protect the equipment but also a strong collaboration with the local recipients involved in order to manage formal acts and transport on site.

Recipients will receive a set of tools for ordinary and extraordinary maintenance.

A model has been developed for a proper characterization of some healthcare equipment in relation to the presence of hazardous substances (in reference to RoHS rules) or other issues related to the classification as waste.

DIAGRAM OF THE PROCESS



RESULTS

Results in Italy:

162 home healthcare equipment and 254 medical equipment donated;

128 devices and 52 small equipment for personal use distributed;

342 medical equipment revised;

45 tons of waste avoided;

120 tons of waste treated;

Results in Romania

189 medical institutions accessed;

21 tons of medical WEEE collected;

875 medical equipment treated;

17 tons of WEEE Med prepared for re-use;



Monitoring of the environmental impact of the Life-MED project

The monitoring of the environmental impact of the project is carried out through specific indexes defined during operational phases. The indexes used are the following:

- tons of waste collected by CAUTO and Ateliere Fara Frontiere in medical institutions and properly managed;
- number of devices and equipment handed over for free by healthcare centers and reconditioned for the next reuse;
- number of spare parts removed from electronic equipment and intended for re-use;
- number of devices and equipment handed over for free by MEMUA and AFF for re-use, to subjects and organizations operating in international cooperation;
- tons of CO₂ avoided in the atmosphere.

Moreover, the impact generated by beneficiaries during implementation actions is highlighted. The main focus is on transport impact.

Distances covered by all participants are monitored through the following indicators:

- km covered by car
- km covered by trucks on the road
- tons of CO₂ released in the atmosphere.

At the end of each project phase an intermediate report is issued, which includes monitoring results, in order to be able to issue a final report describing the overall impact of the Life-MED project and the amount of CO₂ tons avoided in the atmosphere.

Assessment of the social and economic impact of the Life-MED project

The social and economic impact is assessed on the basis of the following aspects:

- increase of employment opportunities, thanks to new hiring by beneficiaries during the project;
- a further increase of employment, once the integrated system for the management of discarded medical equipment is fully implemented, that is after the conclusion of the project;
- access to advanced medical institutions for citizens from all European countries.

The economic impact is linked both to the donation of the equipment and the further set up of the new integrated management system, which makes greater volumes of medical equipment available for a larger number of beneficiaries.

Once this system is at operating speed, it sees an increase in the number of economic players potentially relevant in the sector.

The proposed MED procedures allow to avoid waste and to reduce costs during the inventory phase and during the allocation of medical equipment as waste disposal.

The free handing over path enables health organizations to reduce their disposal investments. The donation to NGOs in Eastern European Countries allows high savings in purchasing the equipment.

www.life-med-equipment.eu

CAUTO

<http://www.cauto.it>

Medicus Mundi Attrezzature

<http://www.memua.it>

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