Reclamation of Plastic Waste generated in Hospitals
LIFE98 ENV/FIN/000577

Project description  Environmental issues  Beneficiaries  Administrative data
Read more

Contact details:

Project Manager: Kari SOROLA
Tel: +358-3-247 5352
Fax: +358-3-247 5548
Email: ksorola@tays.fi

Project description:

Background

The amount of plastic used in medical applications continues to rise. A large proportion of the resulting waste is disposed of in landfills along with ordinary municipal waste, while part of it is incinerated in hazardous waste disposal plants. Despite the fact that there is considerable demand for such high-quality plastic waste materials, the perception that plastic waste generated in hospitals is dirty and unsightly makes people reluctant to use it. Reuse was being prevented by the lack of action models and therefore a utilisation route specially adapted to plastic materials was required. However, practices in different hospitals vary and there is no exact data on the treatment, collection, reuse and required purification of plastic waste. The Tampere University Hospital was the project coordinator. Partners in the project included the University Hospitals of Helsinki and Kuopio, Kanta-Häme Central Hospital and the Waste Management of Pirkanmaa. The project was divided into subtasks, covering the utilization of polythene, polypropene and polystyrene, combustion of plastics for energy, problems in reuse of plastics caused by PVC as well as problems in collection, temporary stocking and transportation. All hospitals taking part in the project charted the amount, the quality and the purity of their plastic waste and the available sorting equipment and facilities.

Objectives

This project aimed to create common guidelines for the possible utilisation of mixed hospital plastic waste. In cooperation with experts in the plastics field, and taking into account the special features of hospital waste, logistics and pre-treatment were developed, which made it possible to reuse plastics as raw material for industry. The qualifications to transport plastic waste through the
treatment centre or directly to combustion for energy recovery were cleared with
the municipal waste treatment plant. Special issues concerning the
transportation of plastic to landfill were also cleared. As a first step, the
hospitals involved in the project quantified the volume of plastic waste they
produce, breaking it down by type of plastic and type of product. Preliminary
results indicated that the hospitals used hundreds of different plastic products
made of widely varying chemical compounds. Once every hospital had audited
its current plastic waste situation, collection and processing got underway. To
facilitate this, guidelines were introduced and separation and collection
equipment was provided. The fractions suitable for landfill, incineration and
reuse needed to be separated as early as possible. The requirements for
transporting plastic waste, and for any after-treatment, burning and dumping at
landfills were studied. Options for reusing the products and/or recycling the
plastic substances into products seem to depend on the purity and homogeneity
of the plastic products and fractions collected. The innovative part of the project
involved finding products suitable for recycling. Potential reusers are small and
medium-sized plastics companies. One subtask was to resolve the problems
connected with the sorting and temporary storage of the plastics and their
transportation to the end user. Research examined whether it is advantageous to
transport different plastics collected in different hospitals to one and the same
reuser.

Results

The main conclusion of the project was that substantial environmental benefits
could be achieved by improving and changing all the stages of hospital plastic
waste handling. This should cover both the procurement policy, aiming to reduce
the volume of plastics entering the hospital, the collection and sorting of plastic
waste requiring information on the chemical characteristics of the materials they
are handling, and improvements in the plastic processing and final recycled
products. The project found that 71% of hospital plastic waste could be recycled,
if it was sorted and collected efficiently. In Finland this could provide sufficient
employment for one to three recycled raw material factories. 17% was found to
be PVC waste which currently in Finland cannot be incinerated whilst 9% was
transported to landfills and recycling use. - The development of an effective
recycling system would depend upon the classification of the cleanliness of
waste, its chemical composition and final usage, and the development of an
efficient sorting and collection facility. Recommendations were made on the
feasibility of an optimum system: - A study was completed on cleanliness
classifications ascertaining the potential for reusage, defining 4 categories: A)
clean plastics that need no special treatment; B)plastics with impurities that need
rinising; C) plastics contaminated with patient's microbes carrying risk of
infection which need to be treated with disinfectant methods or through
autoclave moulding or ageing and 4) plastics contaminated with the cause of an
infection needing separate treatment and disinfection. - Recommendations were
then made for action to be taken according to chemical composition and final
placement (recycling of the object, recycling as raw material,incineration and
landfill sites) - Educational and training material was produced to back-up
coherent, detailed collection procedures and guidelines for staff in plastic waste
separation. - Recommendations were made to increase the logistical cooperation
over waste sorting needs between municipalities and companies involved in
recycling, to direct the waste to different recycling uses, recognising that the requirements for energy waste incineration were as high as for recyclable raw material. - Information was produced on necessary treatments for manufacturing reusable products, particularly highlighting different treatments dependent on cleanliness characteristics. - Recommendations were made on purchasing policy aimed at the purchase of recycled products manufactured from the plastic recycling process eg buckets, PVC mats, bin liners, plugs, coat hangers etc, and to prioritise purchases of hospital utensils made of recycled material, resulting in the substitution of 7000 tonnes of foreign petroleum based granulate by recycled materials. - The treatment of hazardous or extremely contaminated waste was recommended to be the subject of a separate study. The project helped both to increase knowledge and diminish prejudice towards hospital plastic waste, whilst providing concrete guidelines for its management, and for future hospital design and construction. The project's findings could be applied in different health services and could be transferred to other EU countries, with the exception of the recommendations on waste incineration (it being possible to incinerate PVC in the rest of Europe). A follow-up report, carried out in December 2004 by the LIFE external monitoring team, showed the process of separating the plastic waste has recently been extended to several other Finnish hospitals. A large proportion of the rejected waste is also re-used as product and almost all recyclable plastic material is delivered for re-processing. See: http://www.tays.fi (Finnish only).

Top

Environmental issues addressed:

Themes

Waste - Medical waste
Services & Commerce - Healthcare - Social work
Waste - Hazardous waste
Waste - Waste use

Keywords

waste use, plastic waste, hospital waste, waste collection

Target EU Legislation

- Waste

Natura 2000 sites
Not applicable

Beneficiaries:
Coordinator: Tampere University Hospital
Type of organisation: Public enterprise
Description: Hospital
Partners: University Hospital of Helsinki, FI; University Hospital of Kuopio, FI; Kanta-Häme Central Hospital, FI; Waste Management of Pirkanmaa, FI;

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