



un nuovo servizio per la spiaggia

A new service for the beach
Un nouveau service pour la plage
Ein neuen Strand-Service
Новая услуга на пляже

GESTIONE IMBALLAGGI DIFFERENZIATI UTENZE TURISTICHE

GIDUT

(progetto pilota per l'implementazione e la
validazione di un sistema integrato di gestione
differenziata degli imballaggi prodotti dalle
utenze e attività turistiche costiere)

www.gidut.it



1. General Description

GIDUT - Separated Waste Disposal System for Tourists [*Gestione Imballaggi Differenziati Utenze Turistiche*] - is an innovative structure for separating waste for recycling which has been especially designed for the beach. It is an idea that involved 290 private supervised beach areas as well as the theme park "Italia in Miniatura" and over 4,000 shops along the coast in the Emilia Romagna region.

Hera Spa has designed and launched the project, in cooperation with the city of Rimini, Bellaria Igea Marina together with waste recycling organizations (CONAI, National Steel Board, CIAL, COMIECO, RILEGNO, COREPLA, COREVE), the theme park "Italia in Miniatura" and Selecta Spa. The initiative involves the installation of three new types of waste bins in the private supervised beach areas of Rimini and Bellaria Igea Marina in the Borough of Rimini (GIDUT prototypes) for the separated collection of different sorts of waste: steel/aluminium/paper/cardboard/wood, plastic and glass.

The three types of GIDUT waste bins already installed are as follows:

262 GIDUT bases, which are made up of a waste bin composed of a structure with three compartments (one for paper, one for glass, one for steel+aluminium+ plastic+wood), 25 of the GIDUT SELECTIVE design which has a special weighing device for the different types of waste with a user identification system, and 3 of the GIDUT INT design that includes the same features as those for the GIDUT SELECTIVE model in addition to a communication system with a remote base station with an internet link and solar cells for electrical energy.

The project is the first of its kind in Italy and looks to involve both the business operators on the beach and the tourists themselves.

The GIDUT project aims to make business operators and tourists more aware of how waste separation for recycling can be developed. It aims to promote an environmentally friendly behaviour, arousing the interest of tourists and rewarding those businesses which stand out for the quality of their concern for the environment. The development of environmental strategies directly involving visitors will help improve the city's image and the sort of tourist model it proposes. Moreover, the Romagna coast's way of life exercises a strong influence on behavioural habits and trends. Setting good standards in everyday life can really help spread the model proposed, in its defence of nature and of the whole ecosystem.

From the summer of 2004 the project has been expanded to include the beaches in the boroughs of Riccione and Cattolica located within bathing establishments involved in the activity of tenable tourism (recovery of waste, water, heating of the water thanks to thermo-voltaic panels etc.)

An important and integral part of the project is the new "Centro Ambiente (Centre for the Environment)" located just behind the theme park "Italia in Miniatura". This area is designed for separate waste collection and, thanks to a magnetic card, a computer system can identify the kind of refuse and the person who has brought it in and a weighing system can measure the quantities. This Centre is particularly innovative also because of its special subject rooms ("green rooms for packaging recycling") which are used in educational programmes about packaging production and recycling. It is possible to organize guided tours to increase visitor awareness about the correct procedures involved in packaging design, production, management and recycling as well as in packaging

refuse. Associations such as Legambiente, that regularly organise workshops on this subject, can also play an important role.

2. Descriptive outline of the project phases

The project has developed in particular in the following stages

- Meetings of the partners to decide on the various steps for the project's realization;
- Carrying out of a communication campaign (e.g. choice of logo, production of brochures in different languages, printing of T-shirts and posters, distribution of food bags, setting up of an Internet site, CONAI notebook);
- Organisation of events and seminars to promote the presentation of the project particularly during relevant trade fairs (e.g. Ricicla 2002 and Ecomondo 2003);
- Pinpointing the strategies to increase user awareness (e.g. workshops on the beach organised by Legambiente, questionnaires and distribution of promotional items from the associations involved);
- Fixing the guidelines for the University of Bologna's Scientific Department of Rimini, to process the historical data about waste management;
- Manufacturing the prototypes in line with the ergonomic design and the computer interfaces resulting from the cooperation of a designer and a firm specialised in equipment for separate waste collection, which brings together both functionality and an attractive design;
- Starting the collection of waste for recycling also from shops and businesses along the beach ("operative" stage summer 2003), completing the system of integrated and separate waste management *RSU* (Solid urban waste) and *RD* (Separated waste for recycling);
- Starting the data processing system managed by the University of Bologna's Scientific Department of Rimini (faculty of Industrial Chemistry) as well as the qualitative analyses by the Centre CSA in Rimini, specialised in product sampling;
- Starting educational workshops both on the beach and at the Centre for the Environment located just behind the theme park "Italia in Miniatura" to help make tourists feel more aware and involved;
- Carrying out surveys and questionnaires to check the participation levels of tourists and operators in the project.

3. Description of the background of the project, the environmental problems of interest and the objectives which are to be reached.

The project originated from many years' experience that our company has acquired in the direct management of separated and integrated waste service management and of material and/or energy recovery systems. An activity that has allowed for the evolution and improvement of the systems with regards to the management, economics and selection capacity of treated, dry waste, in particular the waste deriving from wrapping and packaging. The project completes the waste recovery system which currently involves the entire domestic and commercial user of the Boroughs of Rimini and Bellaria I. Marina.

For years, all of the internal urban waste has been collected in a separated manner and all of the waste recovered by the cleaning services of the shore has been separated and examined in order to recover the sand present.

The project completes a virtuous cycle, which allows for the involvement of the tourists focussing on the separated waste collection also in the surrounding areas produced in the holiday resorts. The ensemble of the activated initiatives in the tourist areas allows for the recovery to be carried out of material and energy in an increasing number of different types of urban waste directly involving the commercial tourist activities and the actual tourists with a greater development coming from actions and behaviour aimed towards tenable eco-tourism.

4. Description of the adopted solutions from a technical and methodological point of view

The study into the singling out of the conferring and separated collection system of the wrapping waste and packaging has foreseen the acquisition of a series of historical and market data connected to waste management, the existing structures and the physical and anthropoid factors of the area of interest.

Based on the knowledge acquired, the project was defined evaluating requisites such as: The safety of the technological components, compatibility with the environment, compatibility with the general plan of waste management, economic viability of the realisation, working binds. In particular, among the assumptions examined, the final decision relapsed upon that which satisfied the following conditions:

- a) Flexibility of the system in order to favour the collection and recovery of separated waste;
- b) Capacity of stimulating the separated conferment for the effective collection of the selected materials.

Considering that the important part of the collection process and/or of the transportation of the waste and selected materials occurs with a significant amount of labour, particular attention was placed upon the safety and hygiene aspect of the work. The integrated system (conferment, collection, transportation, selection, evaluating and recovery) has been designed in order to minimise the production of waste products and to maximise the quantity and quality of the recovery carried out (glassworks, paper mill, foundry, systems of plastic recovery).

5. Results attained

The analysis of all of the project phases allows us to identify the following significant results:

- Manufacturing of the prototypes after the ergonomic designing of the structures and of the computerised interfaces that has involved both an architectonic designer and a company specialised in equipment for the collection of separated waste in order to combine the functional aspects with the aesthetic ones as well as image, realising a new separated management system not currently present on the European market;
- Starting of the separated waste collection including the commercial users present along the beach (“operative” phase 2003), completing therefore the

integrated and separated waste management system of *RSU* and *RD* foreseen for the territory of the coastal boroughs involved;

- Starting of the analysis system of the data, managed by the University of Bologna's Scientific Department of Rimini (faculty of Industrial Chemistry) as well as the qualitative analyses by the Centre CSA in Rimini, specialised in product sampling, which has identified criticality and excellence of the new system allowing for the corrective and improvement stages to begin, in particular with regards to the prototypes and the initiatives of involvement of the commercial operators along the beach;
- Recovery of a greater quantitative of *RSU* collected and selected as Separated Waste Collection with particular reference to wrapping waste of the spinneret of paper, plastic, glass, steel, aluminium and wood;
- Starting of the educational workshops both on the beach and at the Centre for the Environment located just behind the theme park "Italia in Miniatura" to help make tourists feel more aware and involved also within the schools present in the provincial territory and those on educational trips to the park of Italia in Miniatura.
- Carrying out of interviews and questionnaires to check the participation levels of tourists and operators in the project, which has allowed for the evaluating of the validity level of the system and identify the strong and weak points.

6. Environmental benefits

The starting of the separated waste collection even from the commercial activities present along the beach completes the system, which currently involves all of the domestic and commercial users of the two boroughs contained within the project. Already, all of the waste recovered by the cleaning companies of the shore is selected and examined in order to recover the sand present; in this way, the virtuous cycle is completed which also allows for the tourists in the most popular holiday resorts to be involved, also focussing on the separated waste collection from the surrounding tourist areas.

The ensemble of the initiatives in the tourist area, allows the recovery of more than 50% of the urban waste produced therein. The initiatives regarding the waste involve the commercial activities directly, with further development of actions and behaviour aimed at tenable eco tourism.

The development of the environmental initiatives that sees the complete involvement of the visiting tourists (Italian, those from the EC and otherwise) allow the advancement of the city's image and of the tourist model offered.

The involvement of hundreds of thousands of visiting students encourages the knowledge and spreading of the system in a short time. The coastal area of Rimini is in fact a reality that strongly influences the habits of the young and the behavioural trends. Living a virtuous-style behaviour everyday helps facilitate the spreading of the newly proposed model.

All of the packing waste and packaging collected by the separated waste collection service begin at the selection and evaluation system run by SELECTA S.p.A. This allows for the sorting of the impurities, the division by sub-matrix (e.g. cardboard, newspaper, mixed

paper, coloured glass and clear glass, steel, aluminium cans, other aluminium, PET plastic, PP and PE plastic etc...) and the baling of the different materials selected.

The materials selected are then made available to the collection Consortiums of the packaging affiliated with the *Consorzio Nazionale CONAI*, which arranges for their collection and transportation to the recovery systems (de-stagnation systems, steelworks, foundries, paper mills, wooden panel production systems, spinning systems and/or plastic manufacturers, glassworks).

The involvement of the tourists in the collection of the waste along the beach allows for a greatly flexible population to be controlled towards correct behaviour also for the conferment of the waste produced in the tourist resorts. This can strengthen, in a permanent way, the environmentally correct behaviour also in their residential territory.

The separated waste collection has the difference in that it can be used for thermal-utilization in order to recover energy and materialise the “rest” which will have better thermodynamics (caloric power and more uniform sizes, reduction of the presence of inert and of glazing, reduction of high and low calories) with a consequent improvement in thermal output and greater production of electrical energy and a lower production of scoria, heavy and light powders with a consequent reduction in the consumption of the systems against pollution.

7. Results, summer 2003

The data attained during the LIFE-GIDUT experiment relative to the separated waste operated on the beach establishments of Rimini and Bellaria during the months of July, August and September 2003 are shown below.

Out of a total of 1254.48 tonnes of total waste collected from the sites, 403.71 tonnes (24%) was conferred in a separated manner (Fig. 1). The separated part of waste is subdivided like this: 110.98 tonnes of paper (31%), 194.18 tonnes of glass (54%), and 54.17 tonnes of light packaging (15%) (Fig. 2).

Fig.1 total percentage of *RD* July, August and September Project LIFE Gidut

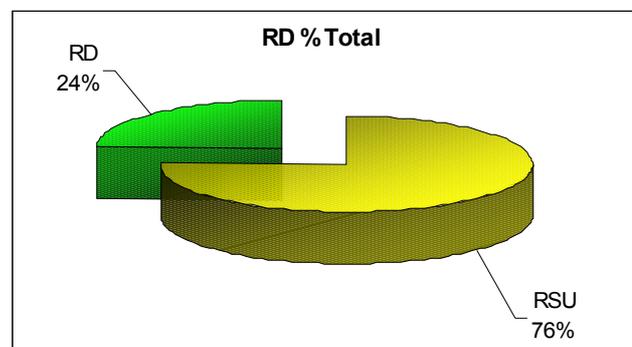
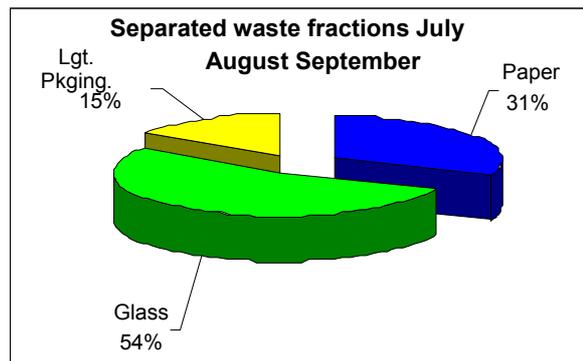


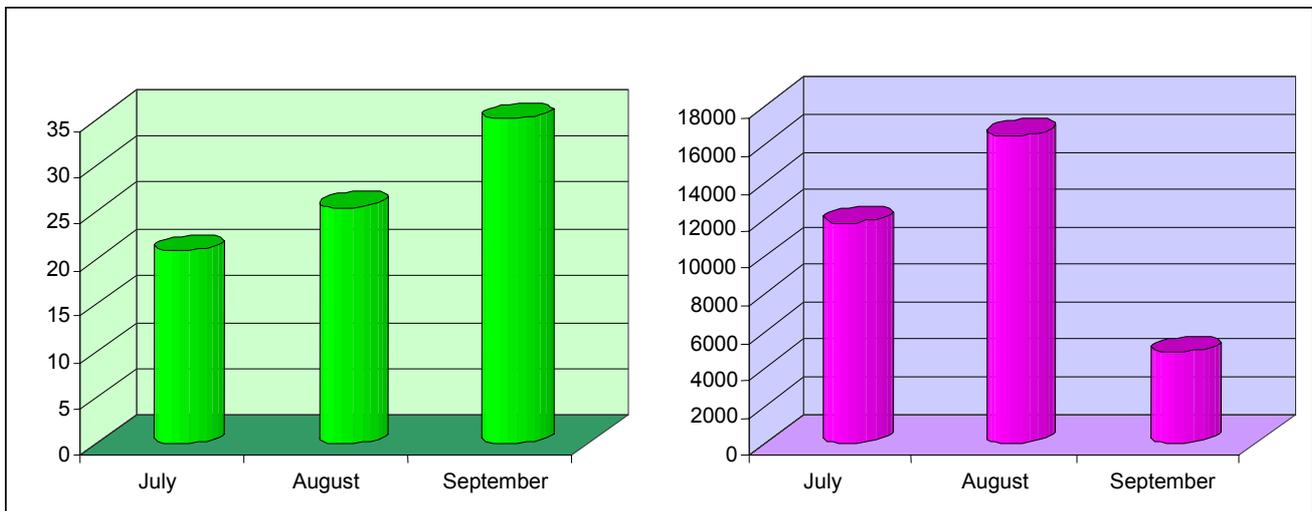
Fig.2 Separated waste % in the hamlets Project LIFE Gidut



By observing the transitory progress of the percentage of the *RD* portion, you can notice a peak in the month of September which, compared with the progress of the daily production of waste, where it is evident that the production peak in August, leads to the assumption that the of tourists are more greatly involved and conscious with respect to the differentiation of the waste produced along the beach in the month of September.

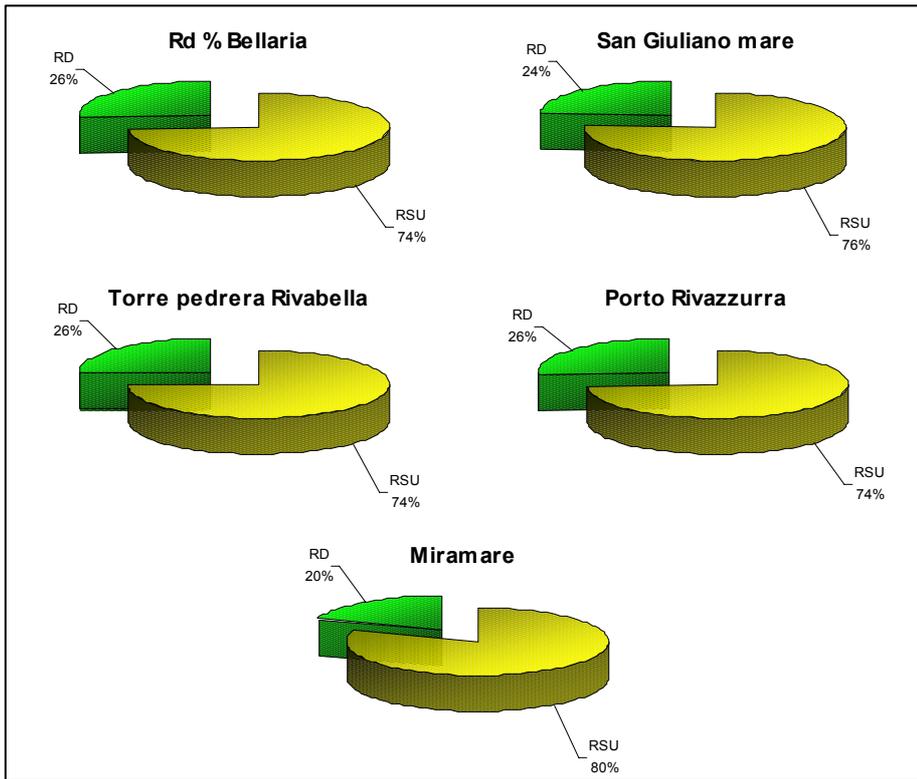
It is however left to indicate that the fact that during the month of September the administrators of the beach establishments find themselves just after the period involving the most difficulty and confusion, in which even the attention towards the differentiation can be difficult to sustain.

Fig. 3 RD % Portion and Daily waste production (Kg/day) July August September 2003



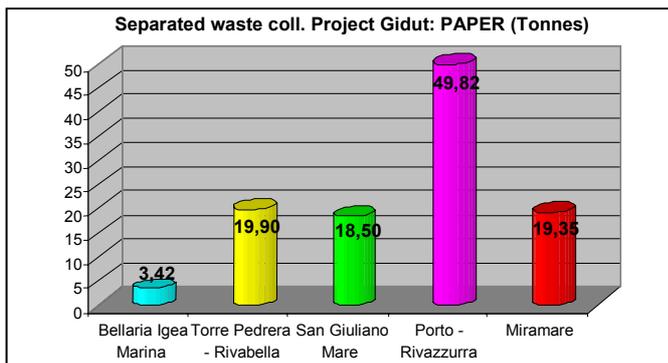
By analysing the data in a distinct manner for the areas of Bellaria, Torre Pedrera, San Giuliano, Porto Rivazzurra and Miramare, you can see that the percentage of waste gathered in a separated way is variable from 20% to 60% depending on the area. Among the areas in which the differentiation occurs more greatly we see: Porto Rivazzurra, Torre Pedrera-Rivabella and Bellaria Igea Marina (26%).

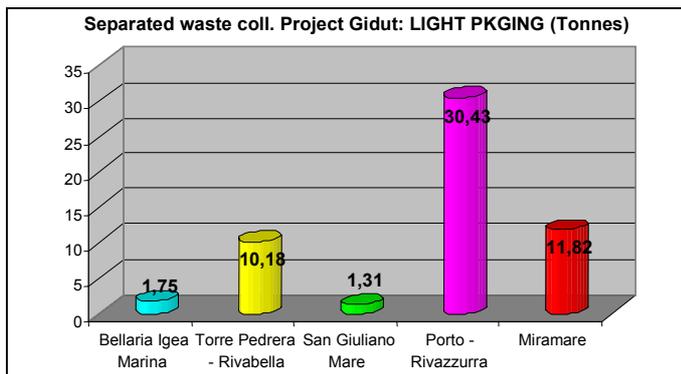
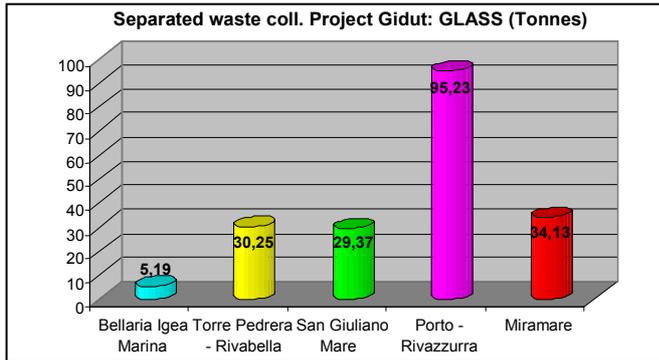
Fig. 4. RD % subdivided by application area of the LIFE Gidut Project



Finally, the conclusive charts are shown below which illustrate the quantity of waste collected in a separated manner by means of the Gidut, subdivided into the various hamlets. In accordance with that stated above, you can see that there is a great influence in the area of Porto-Rivazzurra which, situated in a position closer to the historical centre of Rimini with respect to the other locations, is due to a greater flow of tourists.

Fig. 7 Separated waste collection Project LIFE Gidut: PAPER, GLASS and LIGHT PACKAGING subdivided into application areas of the project.





8. Transferability of the project

The interest in the project regards both the environmental and the economic aspects; only in this way can the system be self-sufficient.

By reducing the waste collection and disposal costs and by increasing the separated waste load of packaging at the source by involving tourists, means to activate an inversion of trend with regards to what has occurred in the last ten years. The new approach of sensitisation must be maintained in order to govern the conferment of fractions of urban waste according to the market and the necessity of material and energy recovery systems to follow. That further increases the economic interest of the proposed Method.

The methodology proposed by the Project GIDUT and, above all, the tools and the actions of sensitisation are greatly reproducible with success in the majority of medium, large tourist cities along the European coast as well as by consortiums of small Boroughs.

The techniques used are without doubt applicable on a vast scale.

It is considered that the characteristics which distinguish the technique of acquisition (consent and separated conferment of the waste, in particular packaging), the efficiency of the proposed system and its standard production can also find applications in other areas involved in strong flows of tourists (theme parks, natural parks, protected areas).

Once the technological solutions and support required by the implementation of the separated waste collection system of packaging are identified, it is necessary to guarantee the availability of such support with maximum efficiency and effectiveness, in addition to

investment and management costs that allow the maximum restraint of successive management and service costs. It is also necessary to identify the most effective communication solutions and support materials.

The implementation of a monitoring system of the variations in the behaviour assisted by automatic technology is foreseen in order to record data with regards to the material collected. In Rimini a "Waste Observatory" is already operative and 14 ecological islands named "Centro Ambiente" *Centre for the environment*, these two tools already allow for the monitoring with regards to the conferment of the hamlets, such as paper, plastic, glass etc., by the producers in favour of the specific receiving centres. GIDUT empowers and expands the virtuous system.

The wager, which proved to be winning, was to think that **the tourist is a "resource"** even in the evolution of the virtuous behaviours and of a culture observant towards the eco-tenable development. The involvement of the commercial operators, despite in a period of strong working activity, can be stimulated to a strong participation. There is the awareness that the initiative is of a high quality and suitability for all tourist areas and activities involved.

This allows for the experimentation of a new system which, by operating new forms of involvement of the user up until the phase of conferment, allows for the governing, in an optimal way, of the successive flow of high capacity separated waste collection to the actual recovery operation.

The system allows for the transformation of a potential moment of minor attention to the environmental problems, that of the holidays, into a point and moment concentrated on strong virtuous involvement and attention.

The concept is overturned that during the holidays one is less careful and, instead, a system is activated which, with the sole efficiency presence and valid communication support systems, allows significant involvement level,

The holiday with its less frantic pace can become a moment of curiousness and attention towards new solutions and tenable eco behaviour.

The concentration of hundreds of people in a reasonably restricted amount of space, for several hours, moves towards activating the attention on particular systems proposed that is reminded from each and every parasol with small communication devices.

The same tourists can become the control group of the users. A transactional group that we could define as "**European Conferrer**". A moment of communication is, therefore created, in different languages linked to a system of strong lure and potential involvement that can determine virtuous developments of the project.

Many tourists are public administrators of cities and/or companies of the sector, adhering to environmental organisations etc. For this reason, the system can be observed "discretely" even by them in every aspect, and can produce interest and availability to its reproducibility and evolution.

The expected benefits are especially in favour of the environment thanks to the reduction of waste and all forms of direct and indirect pollution in the collection of the waste.

It is activated in this way by an exchange of experience and deep opinions, which allows for new development.

At the same time as the realisation and experimenting phase, a first phase of dispersion, which follows the project step by step, is activated, spreading it and allowing for potential development of further contributions and further dispersion. In addition to that foreseen for the dispersion in the actual project, the tourists that participate in the project can become those that spread the word of the initiative.