

Recons Project: Minimizing Construction Environmental Impact

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RECONS PROJECT: MINIMIZING CONSTRUCTION ENVIRONMENTAL IMPACT

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Abstract

The aim of the RECONS project is to minimise the environmental impact of the construction sector activity and to define sustainable waste management strategies.

The innovative nature of the project RECONS lies in the cooperative approach to an Environmental Management System according to the 761/2001/CE Regulation that states that organisations can voluntarily adhere to a Community Environmental Audit Management System (EMAS).

The project considers the promotion of the EMAS in small and medium-sized firms and micro-firms of the construction industry.

The project RECONS, in the construction framework, seeks to make the application of a Cooperative Environmental Management System viable through the Builder Professional Union of Catalonia (Guild) and to extend it not only to the activity of the Union but to the smallest firm related to it.

Defining this objective means taking into account the following aims:

- Facilitating the implementation of environmental policies in small, medium-sized and micro firms
- Sensitising and involving employers and employees in an efficient and effective way by means of the organisational structure and the existing channels between the small and medium-sized firms and the micro-firms as well as the Guild that associates them
- Attaining that the environmental intervention at the defined geographical territory connects all the present actors and optimises the work relations among them.
- Fulfil the environmental legislation related to the construction sector at the local, autonomic, national and european levels.

The specific objectives are:

- To present the Project to the members of the Builders' Guild as well as the various agents involved in the construction sector and relevant administrations.
- To explain to the members of the Guild of Constructors and those responsible who are directly involved the approach to be taken to the project and its planning.

Key words:

Recons: Reducing construction environmental impact

SME: Environmental Management System

1. PROJECT PARTICIPANTS

The technical ability of the participants in the project can be seen in the following graph:

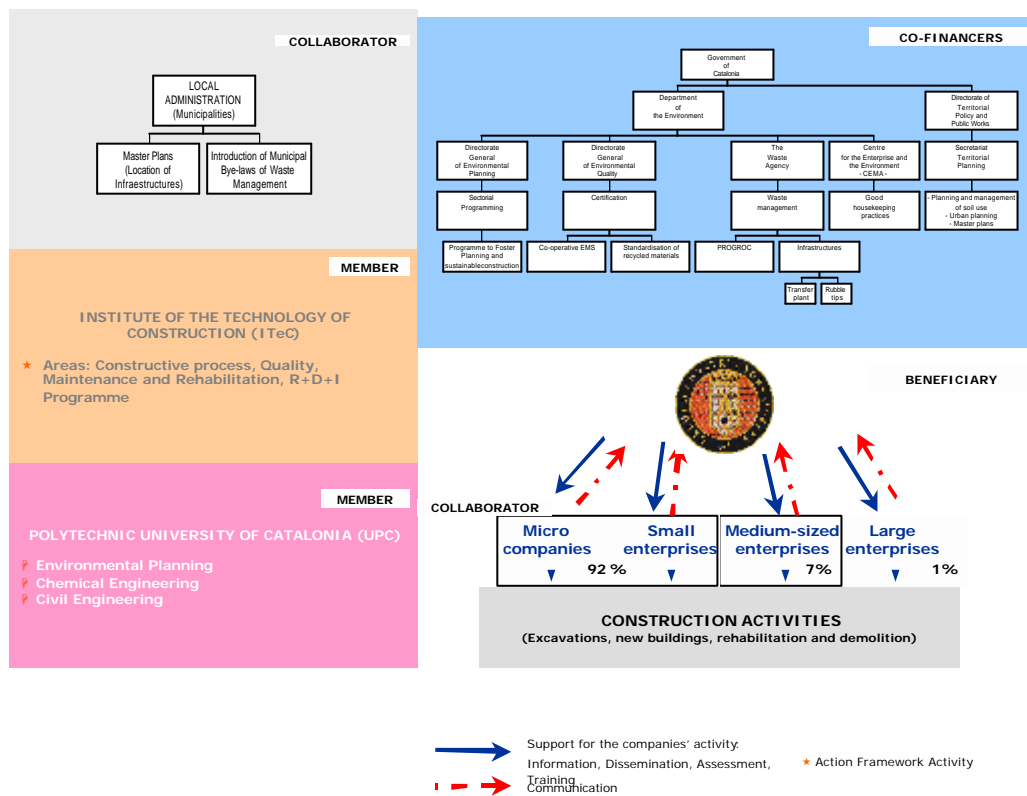


Figure 1: Project participants

2. TASK FLOW

Below, follows a description of the task flow to be developed to carry out the RECONS project

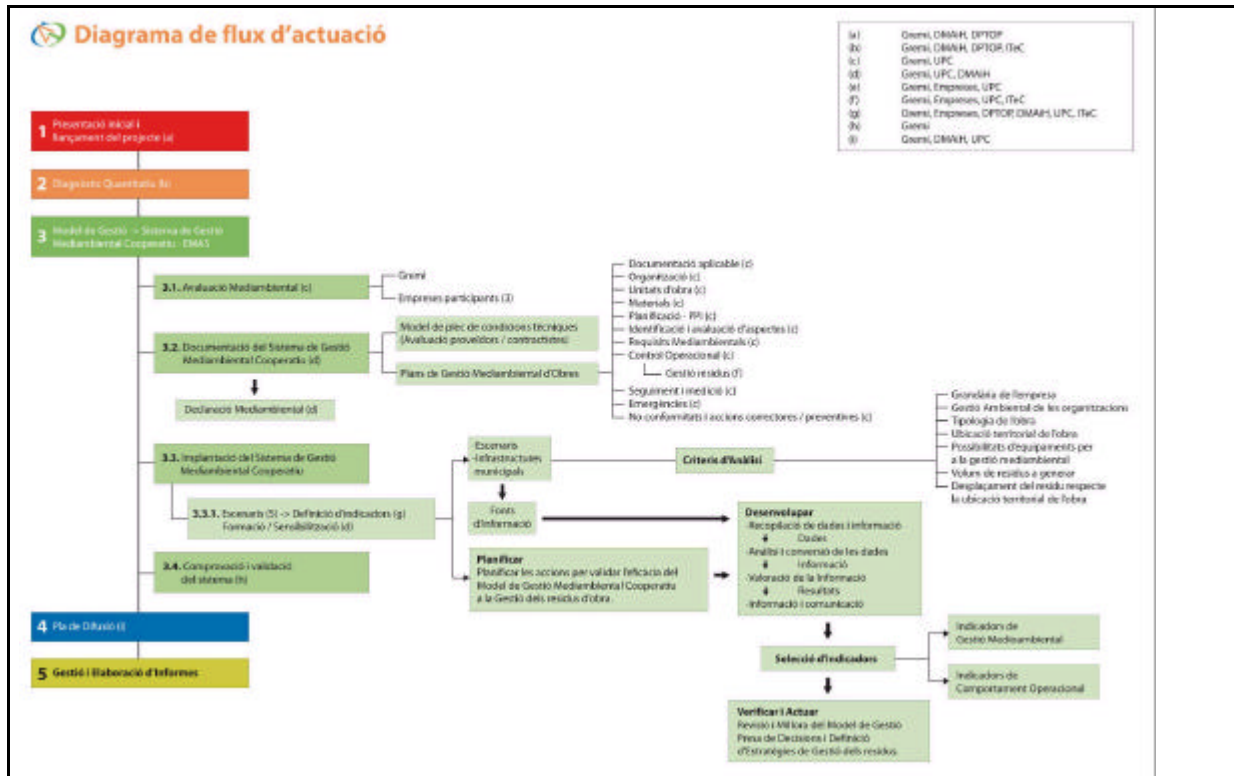


Figure 2: Task flow

3. TASK DESCRIPTION

Elaborating a qualitative diagnosis to obtain data from the industry (T1)

There is dispersed information about the real environmental impact of building activity in the metropolitan area of Barcelona (323,000 ha, 4.5 million inhabitants), taking into account the different territorial realities (from urban to rural).

In order to know the reality of the building sector in this territorial unit and the environmental problems derived from carrying it out, it is vital to localise, order, analyse and synthesise the data that exists about it, with the aim of obtaining updated and reliable information about the sector that will enable decision-making strategies to be defined and, in the end, to model the alternatives for management efficiently. When analysing this data, the

different variables that define Environmental Management of the sector will be taken into consideration, which are the following:

- Size of the company
- Its situation in the territory
- Stage / Unit of Work
- Environmental Management Equipment
- Extraction activities
- Volume of waste/Treatment
- Management itineraries

Designing a Cooperative Environmental Management Model (related to the 721/2001/CE EMAS regulation) (t2)

The Principles of the Design of the Co-operative Environmental Management System Model are established in accordance with the following:

- Both the organisation, functions and responsibilities, as well as the activities and actions that are established in the Co-operative Environmental Management System, will reflect, as far as possible, the current function of the Guild, including, however, the modifications and new activities that are considered necessary to adapt it to the requirements of the System, taking as a reference the EMAS model. The modifications and new activities proposed will be proposed in such a way that they will optimise the efficiency of the processes: adapting existing operative documents and defining the mechanisms of communication and protocols of operation between the Guild and the member companies.
- The systematisation, rationalisation and standardisation of the activities that generate or that could generate environmental aspects of a greater or lesser significance, will have as its aim the prevention and minimisation of the environmental impact derived for the different activities that the building sector develops. As a result, the introduction of the system should initiate the Guild and the companies involved in a process of continual improvement of its environmental behaviour.
- In the Co-operative Environmental Management System both the information that is to be collected systematically to recognise the possible incidents as well as the mechanisms for action for their correction, prevention and improvement will be included.

Accomplishing an environmental assessment (T3)

The activities of the central headquarters of the Guild in Barcelona and the respective headquarters of the building companies participating of this phase of the project are

considered to be the object of the Environmental Assessment. In the same way, centres of temporary work will be defined to assess, depending on the unit or phase of the work that is being carried out at the time the assessment is made.

As a minimum, temporary work centres in which the following construction activities are developed will be the object of assessment: - A new building with excavation of the metropolitan setting, - Demolition in an urban centre, - Rehabilitation in an urban centre, - A new building in a rural setting, - Civil engineering in a metropolitan setting.

In this way, the set of work selected and the central headquarters previously mentioned, will cover a representative spectrum of the activity of the sector, which will offer a good appreciation of the environmental points that its activity generates.. However, it must be taken into account that viability in the consideration of the environmental aspects, will come largely from the specific setting in which each site is located and the transport obliged by the management of particular aspects.

Elaborating the Cooperative Environmental Management System Documentation (T3.1)

Based on the Environmental Assessment carried out, the documents required for the Co-operative Environmental Management System to comply with the requirements derived from the concept of co-operation between the Guild and the member SMEs and micro companies will be drawn up. The reference point for the development of this phase of the project will be the structure and requirements of Regulation (EC) 761/2001 (EMAS).

The documents will be divided into three levels:

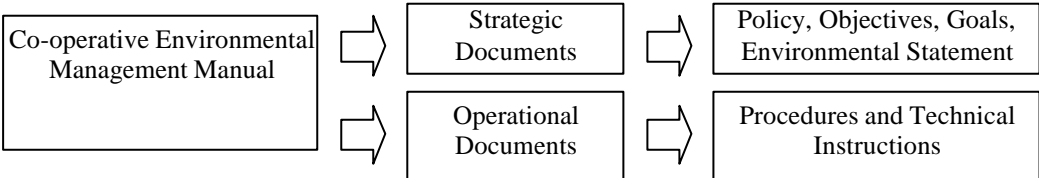


Figure 3: Different levels of the document

The documents of the Co-operative Environmental Management System must be as complete, clear and precise as possible, to facilitate and ease its consultation and understanding by the building companies involved in the project and, in the future, those that adhere to the system. Therefore, one must try to write up all the documents of the System simply, using the greatest number of graphics possible.



Figure 4: Pyramidal structure of the document

Implementing the Cooperative Environmental Management System (T3.2)

To ensure that the introduction process develops in an optimum way and guarantees the smooth running of the system, two kinds of instruments will be used:

1. Training staff.
2. Technical service in setting up and developing the system.

During the process of introducing the Co-operative Environmental Management System, the members of staff of the Guild and of the participating building companies must become integrated into the system, as they have to participate in the process of continuous improvement of environmental behaviour. This involvement can be considered from two points of view: on the one hand, they will be participants; and on the other they should be informed and trained to achieve their participation.

Of the mechanisms of participation the EMAS system proposes, which is the reference for this project, the following are noteworthy:

- Reciprocal information between the different levels of the organisation.
- Education and training on the basis of the EMAS (in accordance with the responsibility).
- Participation at all levels and at all stages.
- Establishing the tools that will enable the channelling of suggestions from the employees and of reward systems.

System Implantation. Pilot experiences - Defining indicators (T3.3 / T3.3.1)

To achieve the desired results, 10 pilot schemes will be carried out in 5 scenarios of action, depending on the different alternatives of waste management. The scenarios chosen are the following:

- a) Activities of building new constructions with excavating activity in a metropolitan setting.
- b) Activities of building new constructions in which the Project Phase has included criteria for minimising, re-using and classifying the site waste.
- c) Demolition activities in an urban centre.
- d) Activities of rehabilitation in an urban centre.
- e) Activities of building a new construction in a rural setting.

For each of these 5 scenarios, one or more of the building companies will be involved. The building projects associated with these five scenarios should have an Environmental Site Management Plan, a document that reflects the application of the requirements of the Co-operative Environmental Management System in the project. The scheme, therefore, will allow the introduction and validation of the efficiency of the system in different realities and sizes of companies. In these five scenarios, therefore, the respective Environmental Site Management Plans will be introduced, which will define, amongst other elements, the alternatives for building waste management at several levels, depending on the location of the site. These levels will be the following:

1. Re-use "in situ": reduction and separation at source. For each site, there will be an analysis of the possibility of "in situ" installation of technology for recycling the waste.
2. Waste recovery outside the site:
 - Segregation of site waste ↪ clean waste
 - Final waste fraction with various residual materials (stone and mineral materials, metallic fractions, others ...) ↪ dirty waste
 - This contemplates the introduction and validation of good housekeeping practices in site waste management and the introduction of procedures for segregating materials likely to be recycled in external installations:
 - Transfer plants
 - Fixed recycling plants
3. Disposal of final waste in landfills. For correct waste management, in the scenarios where, for certain reasons the waste cannot be introduced again into the productive cycle, procedures will be defined to validate and control the destination of the waste fractions that are taken to landfill. The disposal of final waste is always considered as the final option in waste management, with the intention of minimising the quantity of waste sent to landfill. The location of landfills will be assessed with regard to the building sites.

Testing and validating the system (T3.4)

- To articulate the mechanisms required to complete the process of introducing the Co-operative Environmental Management System successfully.
- To put into practice the processes of continuous improvement of environmental management.
- To facilitate the use of self-control by the building companies in environmental matters.
- To guarantee that the Model adapts to the technical and economic conditions of the SMEs and micro companies, so that its immediate application is feasible.

Model diffusion planning (T4)

- To raise awareness of the project in general, and the Methodology in particular, fostering its application both on companies in the Territorial Unit and in other Spanish and European companies that operate under similar conditions to those of the area which is the object of the project.
- To distribute the materials that result from the associations, organisations and bodies linked to the building sector and particularly those that make up SMEs and micro companies at a regional and state level, as well as local, regional, state and community Administration with competence in the matter.

The development of these stages is rounded off with the starting-up of a Training and Awareness Plan.

In this process a particularly relevant question for the project is guaranteed - developing and implementing Building Environmental Management Plans that will allow controlling and assessing the management of those environmental aspects generated by the building activity.

When defining the Building Environmental Management Plan, the necessary criteria to guarantee its effective and efficient implementation in the small and medium-sized firms as well as in the micro-firms should be taken into consideration.

The Plan seeks to integrate the environmental management criteria of the Cooperative Environmental Management System into all stages related to a building project - from the project Designing stage to its Planning and Execution. The plan should reflect the implementation of the System to a particular building project. Therefore, this document should gather the different ways to actuate, the resources and the list of activities linked to the environmental management related to a particular work.

4. EXPECTED RESULTS

- A cooperative environmental management system applicable to the whole construction industry in Catalonia and other regions in the EU
- A significant reduction of the environmental impact derived from the activity of the different firms participating in the project

- A procedure to develop Building Environmental Management Plans applicable to small and medium-sized firms as well as to micro-firms in the construction industry
- A definition of waste management strategies derived from building activities - defining and listing environmental management and operational behaviour indicators for decision-making in strategy selection
- To start the proper recycling and reuse process of the reject materials of the construction, to formalize the endorsement process that guarantee their application in the construction industry.
- A practical guide for cooperative environmental management that guarantees a constant improvement of the environmental results in the industry.
- The Model diffusion is planned to be carried out both within the aimed region and in the whole Catalan territory, as well as in other Autonomous Communities in Spain and other European regions.