Challenges and perspectives in addressing construction and demolition waste in the circular city

A circular city is a city that has recirculated and revalues all its own resources, in a closed loop, permanently applied and generalized the principles of the circular economy, both for the public and for the private environment. That is why a circular city is a sustainable city by definition.

The idea of our project is based on this definition and addresses the problem of waste not only from the perspective of its impact on the environment, but responds through clear, real and achievable solutions to issues related to economic, social and even cultural aspects.

One of the main challenges regarding waste is the management of construction and demolition waste, which according to the EU Protocol in this field: "In terms of volume, construction and demolition waste is the largest waste stream in the EU - it accounts for one-third of all waste produced. Proper management of construction and demolition waste and recycled materials - including the proper handling of hazardous waste - can have major benefits in terms of sustainability and quality of life. However, this can also bring major benefits to the EU construction and recycling industry, encouraging the demand for recycled materials from construction and demolition."

Given these issues, our project envisages the implementation, at the local level, of a Zonal Center for Storage and Sorting of waste resulting from constructions and demolitions, which will be under the supervision of the local public authorities from Cugir. At the same time, the project provides for the establishment of a firing range, made with the help of sorted waste (using hydropower, maintaining the existence of the Cugir Dam), in this zonal center, aiming to test the technical-tactical performance of weapons categories designed in the Cugir Armament Factory. Introducing the concept of economic circularity from the perspective of waste recovery at the local level and promoting circularity in urban areas by involving the population in waste recycling activities for reuse, granting a new life cycle for military purposes, and more. The implementation of this activity supports sustainable development through the recycling process according to the principles of the circular economy.

The high degree of circularity of the idea, as well as the contribution to the long-term development of circular city results from the reuse factor of the following materials:

- Iron and plastic: targets;
- Copper/steel / aluminum: tank projectiles;
- Wood: weapon bed, transport crates (for preserving weapons and ammunition);
- Windows (glass / double glazing): testing the bullet penetration capacity;

- Concrete / brick / earth (rubble) => berm (construction in which bullets stop trajectory);

The main actors are Romarm and Cugir City Hall.

Our company intervenes based on certain financing (about € 100,000) and on the concession from the mayor's office (15 hectares of land).

What does the mayor's office gain?

- ✓ a cleaner city, because we are obliged to take over construction waste;
- ✓ work places for the citizens of the city;
- ✓ get rid of the problem of recycling on a long term.

What do we do with construction waste?

We arrange the polygon (walls, buildings, bays) organized in the form of play/shooting surfaces with real ammunition; and why not, even paintball. In addition, part of the range is reserved for the armament factory which has unlimited availability to test and promote its products (because it also produces weapons for civilians) in exchange for an annual subscription. The range is open to the public interested in testing real ammunition or in paintball, providing a source of income for the organizer.

What is the expected impact of this project?

The project we propose generates, by its nature, a major impact on the social, environmental and economic level:

1. At the **social level**, it contributes to the promotion of supporting the circular economy as a solution to ensure sustainable development at the national level.

2. On the **economic level**, the proposed idea helps to reduce costs, this aspect being achievable by reintroducing in the economic cycle the waste obtained from demolition and it can even be source of income for the municipality if it uses the advantages of this project as a tourist attraction.

3. At the **environmental level**, the project proposes the replacement of the term consumer with that of the user. Thus, the materials are reintroduced in the economic cycle contributing to the protection of the environment.

The proposed idea faces the challenge of promoting the development of technologies and processes that allow the collection and recovery of materials, at the end of their life cycle, in a circular city. One of the most important advantages of implementing is that the project extends to civil society, not just the military. This can be considered a source of income (building a civilian polygon), but also a workforce, through the possibility of creating new jobs (security, waste, selection, transport, drivers), ensuring the premises of sustainability and keeping alive the tradition of this city.