

Researchers from nine countries are leading the European project SUM4Re, aimed at reducing and recycling construction materials from the pre-demolition phase.

The aim is to reduce waste and promote circular construction practices. SUM4Re is a new project co-funded by the European Commission; it has a budget of €6.5 million and unites partners from nine countries.



The consortium gathered on 12 and 13 June in Vigo, Spain, for the kick-off meeting.

Construction and demolition waste (excluding mining waste) represents the largest waste stream in the EU in terms of total tonnes. In 2020, the total amount of construction and demolition waste in EU countries was 330 million tonnes (excluding excavation and dredging activities). The intensive use of raw materials in the construction sector accounts for over 40% of greenhouse gas emissions, including the use of primary materials, which are threatened by their scarcity, high economic value and environmental impact.

Although the recovery rate of construction and demolition waste is high in the EU, this waste is mainly used in low added-value applications, such as scrap and other low-value construction systems. *"Almost all construction by-products can be recycled. The key is the cost of these secondary materials when they reach the market, so that it is not higher than that of primary materials based on the*

consumption of new raw materials", explains **Pedro Arias Sánchez**, professor at the UVigo School of Mining and Energy Engineering and researcher at Cintecx, who also confirms that the technology is more developed for the production of products from raw materials than for secondary materials made from recycled products. As for the by-products with the greatest market penetration, these vary from region to region in Europe, depending on the materials most in demand in the construction sector, although Mr Arias points out that in terms of CO₂ savings, the re-use of concrete waste is by far the greatest savings potential, followed by the recycling of oil, asphalt, wood and PVC. What's more, 30% of construction and demolition waste is landfilled.

It is against this backdrop, and in line with the green agenda that the EU has been promoting for several years, that SUM4Re - *Creating materials banks from digital urban mining* - a research project led by UVigo and involving partners from nine European countries, has been launched. Funded to the tune of six and a half million euros via the Horizon Europe program, SUM4Re has the threefold aim of reducing waste, recycling materials and reusing these by-products in the construction industry as secondary materials, with one essential nuance, *"that all these objectives are aimed at constructions and infrastructures built prior to demolition or dismantling actions, so that this process is planned and designed while maintaining the objective of reducing waste and promoting circular construction practices"*, explains Pedro Arias, principal investigator (PI) of the project.

Demolition "in an orderly way".

The consortium is composed of 17 entities from the construction sector in Norway, the Netherlands, Spain, Germany, Belgium, France, Finland, Estonia and Switzerland, *"a clear indicator of the interest in the project, which we hope, will help to stimulate the business sector so that the EU continues to be a benchmark in this field on a global scale"*, says the project's PI, who stresses the importance of starting waste reduction, recycling and by-product recovery at an early stage and before the demolition or dismantling of existing built infrastructure.

"The starting assumption is that if materials are located, characterised and quantified, demolition (or rehabilitation, or dismantling) can be carried out in an 'orderly' way to increase material recovery rates and reduce the cost of their subsequent treatment, for their transformation into secondary materials", explains

Pedro Arias, who will be working on this project with researchers from the Applied Geotechnics group. The UVigo group will have to develop its activity with 15.4% of the total project budget, i.e. 922,500 euros, which will enable it "*to tackle the design of the problem from the earliest stages prior to demolition*", explains the PI.

SUM4Re proposes an integrated approach to the creation of material banks from built-up areas, combining urban mining, automated in situ data acquisition technologies and the identification of building components and materials with value for new uses. The project, which aims to support the transition to circular construction practices, will include the implementation of three pilot demonstration projects linked to construction projects and a strategy to improve the qualification of the construction workforce and facilitate the uptake of solutions developed by companies and professional groups with interests in the sector.

Kick-off meeting in Vigo

The project, which began on 1st of June, held its kick-off meeting in mid-June at the headquarters of the Vigo School of Industrial Engineering. For two days, the managers, researchers and representatives of the companies that make up the consortium analysed the most important aspects of the actions that they will undertake during the initial phases of the project, which will last three and a half years.

SUM4Re

Creating materials banks
from digital urban mining

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