



# «Toward a smart & integral treatment of natural radioactivity in water provision services. LIFE ALCHEMIA»

**PROJECT LOCATION: Estonia and Spain**

**BUDGET INFO:**

**Total amount: 1.523.450€ (1.339.936€ total eligible)**

**% EC Co-funding: 60% of total eligible budget**

**DURATION: Start: 02/10/2017 - End: 31/12/2020**

**PROJECT'S IMPLEMENTORS:**

**Coordinating Beneficiary: Fundación CARTIF**

**Associated Beneficiary(ies):** Solar Energy Research Center and University of Almería  
Diputación de Almería  
Tallinn University of Technology  
University of Tartu  
Viimsi Vesi Ltd



*LIFE16 Kick-off Meeting,  
17-18 October, Brussels*

*Marta Gómez  
Researcher and Project  
Coordinator*





## OBJECTIVES & SCOPE:

### Main objectives:

- To demonstrate the technical and economic feasibility of bed filters that will be optimized to remove radioactivity from water and to minimize the generation of Naturally Occurring Radioactive Materials (NORM) exceeding the exemption level. 4 pilot plants in Spain and Estonia will be operated with different strategies to prevent NORM generation.
- To replicate project solutions in facilities of other 5 European countries.
- To promote the transferability to other facilities and EU members.
- To encourage the active involvement of interested parties in the implementation of the Directive 2013/51/Euratom for minimizing the environmental impact of radionuclides treatment in water.

### Solutions:

- ✓ 3 pilot plants consisting on 2 stage bed filters will operate for the removal of Ra and/or U in 3 municipalities of Almeria (Spain) (Action B2), and a fourth pilot plant with an alternative strategy based on innovative Hydrous Manganese Oxide technology (HMO) will be applied for the removal of Ra in Viimsi (Estonia) (Action B4).
- ✓ A cost benefit analysis will be carried out in order to make a rational choice between technologies (bed filters vs reverse osmosis) (Action B5).
- ✓ A database with information of drinking water treatment plants along Europe treating water with natural radioactivity (Action A1) will identify target groups to transfer project outcomes (Action B6).

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## EXPECTED IMPACTS

- **4 filter-based pilot plants will provide removal rates of gross alpha and beta activity up to 90%, and reductions in the concentrations of specific radionuclides (U and Ra) between 75 and 90%.**
- **To reduce the amount of NORM generated during the removal of radioactivity by 90%, when comparing with bed filters operating in Estonia (reduction of dangerous substances: mutagenic/carcinogenic indicator).**
- **To reduce the cost of the treatment over 80% when comparing with RO systems (currently operating in Almeria) (reduction of cost indicator).**
- **To reduce by 80-90% the environmental impact associated to the whole treatment, including the management of the waste generated.**
- **To reduce 80% of GHG emissions from pilot plants (kg CO<sub>2</sub> eq), which supposes 60 t CO<sub>2</sub> eq that will be saved per year of operation (reduction of greenhouse gas emissions (GHG): CO<sub>2</sub> indicator).**
- **To reduce energy consumption over 80%, due to the substitution of RO systems (1 kWh/m<sup>3</sup>) by filter beds (0,2 kWh/m<sup>3</sup>).**