Objective

This project aims to develop innovative techniques integrating advanced materials for the simultaneous seismic and energy retrofitting of the European masonry building stock. Upgrading the existing masonry EU buildings is becoming progressively more important due to: (1) their poor seismic performance during recent earthquakes (i.e. Italy, Greece) that have resulted in significant economic losses, severe injuries and loss of human lives; and (2) their low energy performance which increases significantly their energy consumption (buildings are responsible for 40% of EU energy consumption). Since replacing the existing buildings with new is
prohibitively expensive and has also huge environmental and social impact, their lifetime extension requires considering both seismic and energy retrofitting. It is noted that the annual cost of repair and maintenance of existing European building stock is estimated to be about 50% of the total construction budget, currently standing at more than €300 billion. To achieve cost effectiveness, SPEctRUM explores a novel approach, proposing for the first time a hybrid structural-plus-energy retrofitting solution which combines inorganic textile-based composites with thermal insulation systems for masonry building envelopes. The effectiveness of the proposed retrofitting system will be validated experimentally and analytically. Moreover, a common approach for the buildings performance classification will be proposed, allowing to assess whether energy efficiency and disaster-resilient practices should be integrated. Eventually, draft guidelines and recommendations for determining future research design on concurrent seismic and energy retrofitting of EU masonry buildings envelopes will be proposed.

**Fields of science**

engineering and technology › civil engineering › structural engineering › earthquake engineering › seismic loading
engineering and technology › materials engineering › composites
natural sciences › earth and related environmental sciences › geology › seismology

**Programme(s)**

H2020-EU.1.3. - EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions

H2020-EU.1.3.2. - Nurturing excellence by means of cross-border and cross-sector mobility

**Topic(s)**

MSCA-IF-2017 - Individual Fellowships

**Call for proposal**

H2020-MSCA-IF-2017

See other projects for this call

**Funding Scheme**

MSCA-IF-EF-ST - Standard EF
Coordinator

JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION

Net EU contribution
€ 168 277,20

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Région de Bruxelles-Capitale/Brussels Hoofdstedelijk Gewest > Région de Bruxelles-Capitale/ Brussels Hoofdstedelijk Gewest > Arr. de Bruxelles-Capitale/Arr. Brussel-Hoofdstad

Activity type
Research Organisations

Links
Contact the organisation
Website
Participation in EU R&I programmes
HORIZON collaboration network

Other funding
€ 0,00

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