

ReSHEALience is a project with a duration of 48 months, starting in January 2018, and a budget of 5,557,595.50 €.

## > GENERAL OBJECTIVES

- 1 **Increase significantly the durability of concrete** to decrease maintenance and reduce consumption of resources.  
This innovative and sustainable material is defined as Ultra High Durability Concrete (UHDC).
- 2 **Quantify and predict the durability of UHDC structures** in different service conditions when subjected to Extremely Aggressive Exposures (EAE).
- 3 **Validate the capacity of the UHDC** and the new developments, through 6 pilots (TRL6-TRL7) covering two strategic sectors (SS) where the material is expected to add high value and generate large impacts.

The project is oriented to support two EU strategic priorities (SP):

### BLUE GROWTH

The development of the high blue economy potential is promoted with pilot 3 (Offshore energy, embracing wind, wave and tidal), pilot 4 (aquaculture infrastructures) and pilot 6 (coastal protection).

### GREEN GROWTH

Move towards an energy efficient economy is faced through applications for geothermal and biomass power plants (Pilots 1, 2), and efficient use of resources retrofitting of existing structures (pilot 5).

## > 14 PARTNERS



## > WORK PACKAGES

|  |  |   |
|--|--|---|
| 1<br>Ethics<br>(Leader: PoliMi)  | 2<br>Project management<br>(Leader: PoliMi)  | 3<br>Rethinking structures in XS/XA<br>(Leader: CMW)                                  |
| 4<br>Concept and development of UHDC<br>(Leader: UPV)  | 5<br>Quantification of UHDC improved long-term durability performance<br>(Leader: CSIC)            | 6<br>Modelling long-term durability of UHDC materials and structures<br>(Leader: TUD) |
| 7<br>Business opportunities of the developed UHDC materials and structural solutions<br>(Leader: STRESS) | 8<br>Validation and proof of concepts in real-site durability conditions<br>(Leader: EGP) (pilots) | 9<br>Dissemination and exploitation of results<br>(Leader: RDC)                       |



Rethinking coastal defence and green Energy Service infrastructures through enHancEd durAbiLity high-performance fiber reinforced cement based materials

760824. H2020-NMBP- 2016-2017, RIA

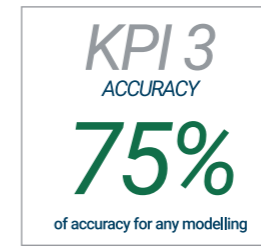
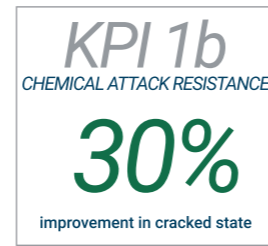
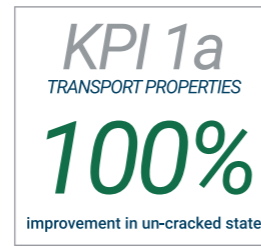


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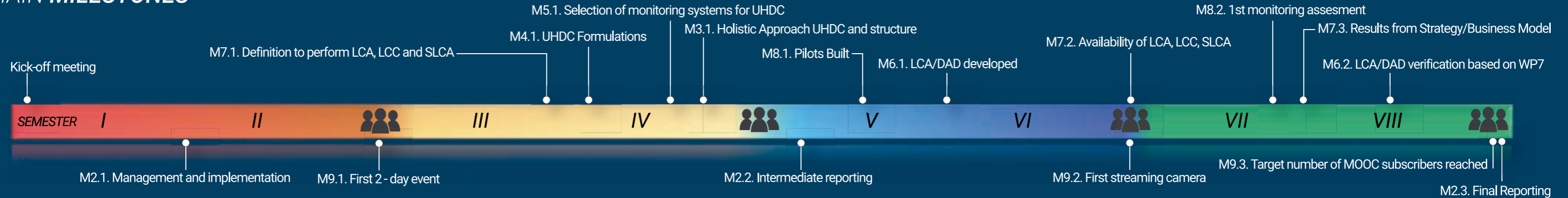


## > 5 KEY PERFORMANCE INDICATORS


FOR EACH SPECIFIC OBJECTIVE AND ITS TARGET VALUE



## > MAIN MILESTONES



## > 6 PILOTS

 **Larderello (Italy)**  
Geothermal power plant tower basin (EGP)

### ACID ATTACK

Cooling tower fluid collection basins are critical due to the fluid aggressiveness and environmental risks


Reduced size basin (7x20m) close to an operating basin and fed with a side stream

 **Monterotondo (Italy)**  
Drilling platform Mud collection basin (EGP)

### ACID ATTACK

In drilling sites a residue basin is used during the mud recycling. Basins are chemically and mechanically stressed due to frequent cleaning


A suitable drilling site will be identified where a new basin will be built with developed the UHDC

 **Valencia coast**  
Offshore wind floater (CMW+OE)

### CL INDUCED ATTACK MEDITERRANEAN SEA

Floater for offshore wind turbines, full scale size of  $\varphi=10$  m, 30 m height, and 50 m of arm length

Reduced size floater for offshore wind turbines. The pilot will be done with a scale 1:5

 **Valencia coast**  
Aquaculture mussel raft (RDC+ IDIFOR)

### CL INDUCED ATTACK MEDITERRANEAN SEA

UHPC mussel farming raft patented. Durable substitute of traditional wooden rafts


Full-scale 20 x 27 m mussel farming raft in Valencia Port: UHDC precast pre-stressed beams

 **Malta Public abattoir**  
Damaged water tower (UM)

### CL INDUCED ATTACK

Concrete water tower from 1st half of the XX century with severe degradation

UHDC textile reinforcement and highly flowable UHDC will be used. Monitoring and control

 **Irish west coast**  
(site to be determined) (BaPreC)

### NORTHERN SEA CL AND FREEZE INDUCED ATTACK

Precast breakwater elements along the British Isles coast. Current design foresees HPC and high covers

6 x 3 x 1.2 m breakwater elements with reduction of thickness and lower costs