New **En**vironmental friendly and **Dur**able con**Crete**, integrating industrial by-products and hybrid systems, for civil, industrial and offshore applications

EnDurCrete project presentation

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 760639.

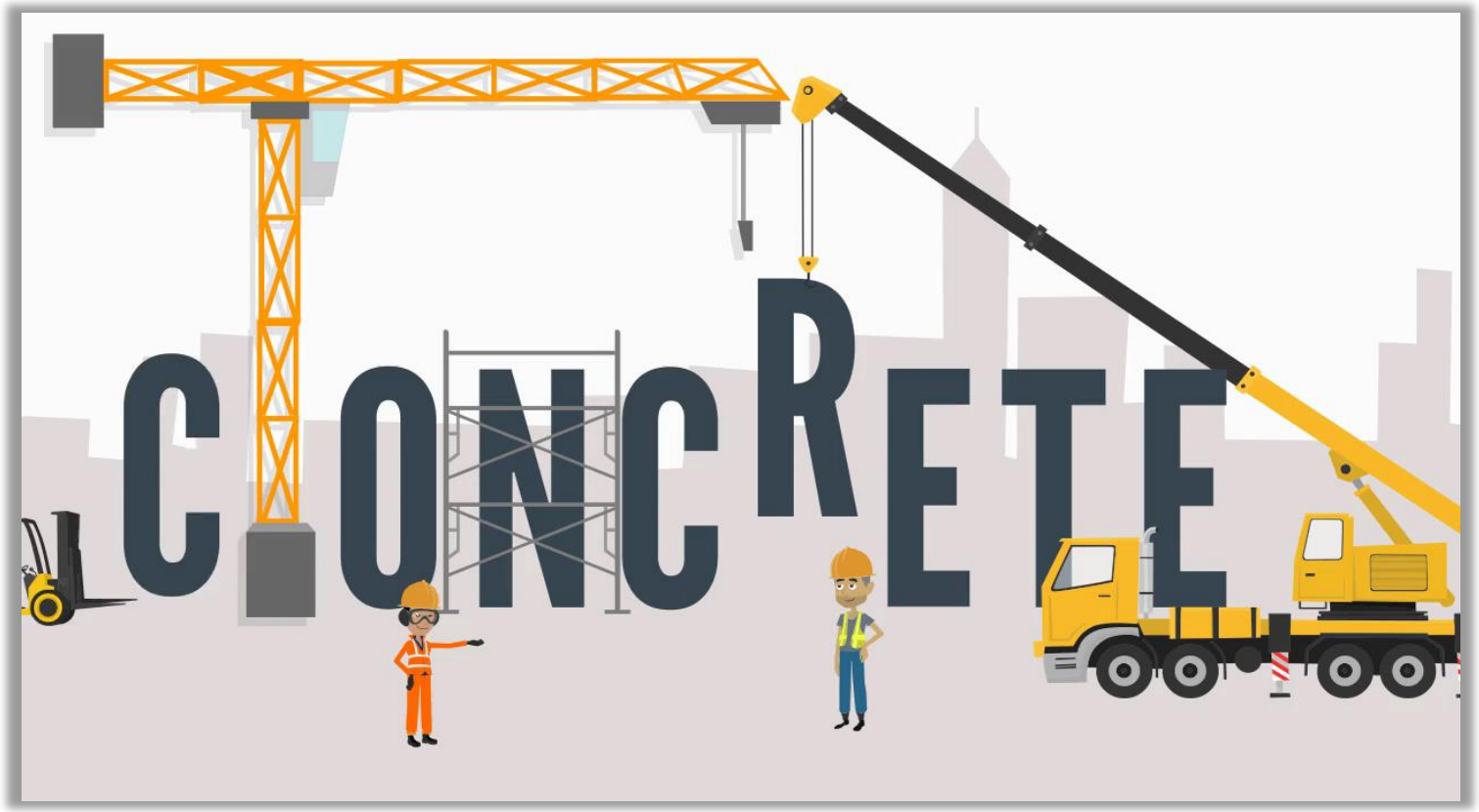
EnDurCrete Project

New Environmental friendly and Durable conCrete, integrating industrial by-products and hybrid systems, for civil, industrial and offshore application

The main goal of EnDurCrete Project is to develop **a new cost-effective sustainable reinforced concrete** for long lasting and added value applications.

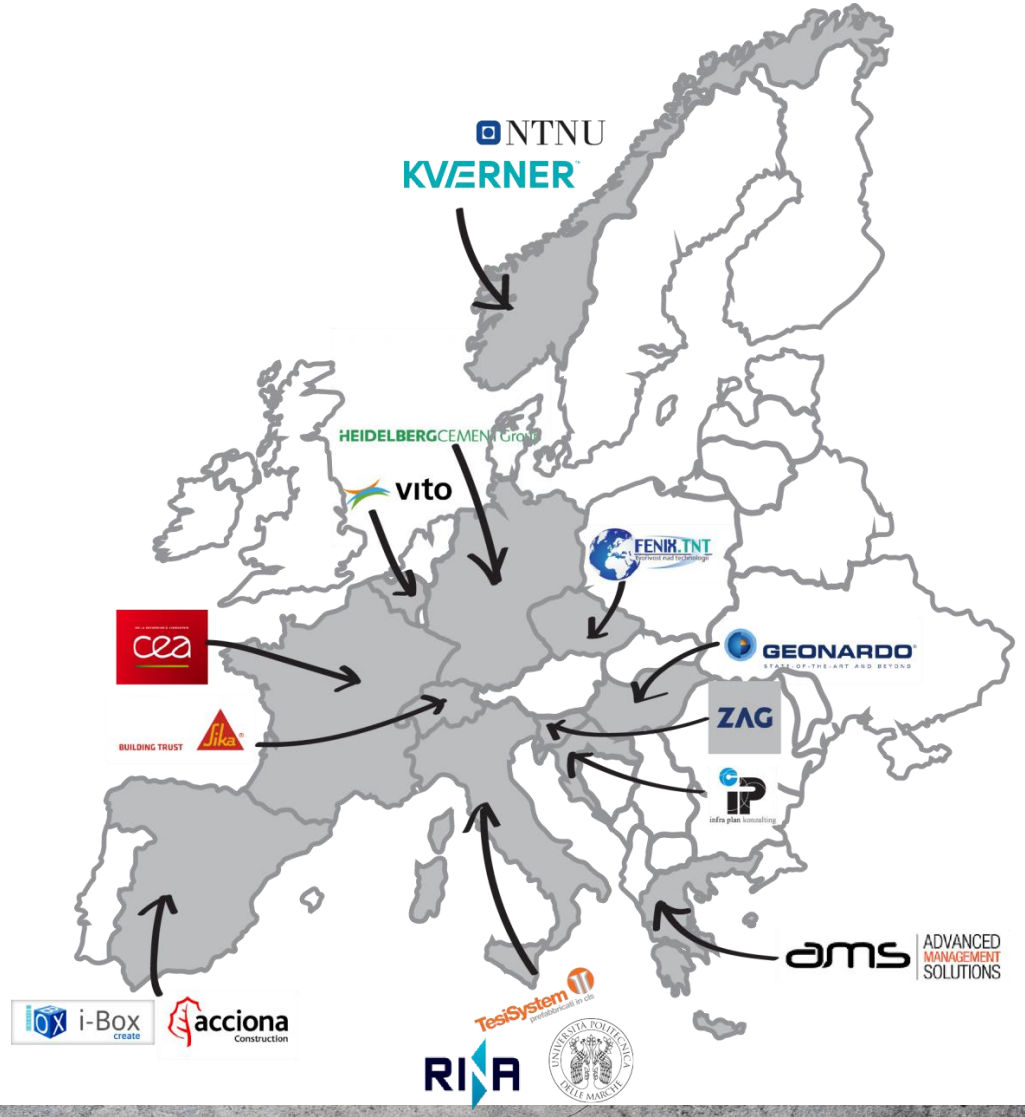
EnDurCrete Project introduction

Watch the **introduction video** summarizing the goals of the project, approach, impact and more:
https://www.youtube.com/watch?v=Jfgom15vUsg&t=32s



Partners

16 partners
from
12 countries



Project objective

The concept is based on the integration of novel low-clinker cement including high-value industrial by-products, new nano and micro technologies and hybrid systems ensuring enhanced durability of sustainable concrete structures with high mechanical properties, self-healing and self-monitoring capacities.

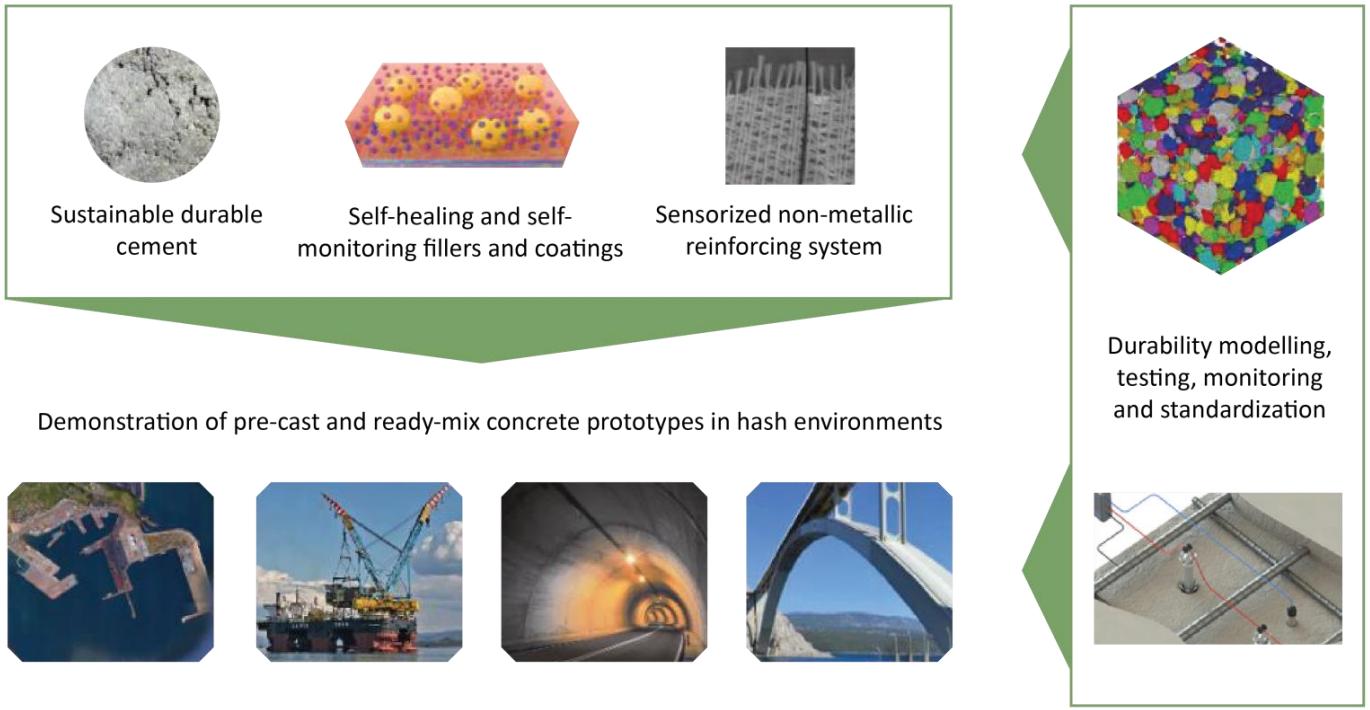
The key EnDurCrete technologies:

- → Nano-enabled smart corrosion inhibitors
- → Self-sensing carbon-based nanofillers
- → Multifunctional coatings with self-healing properties
- → Sensorised non-metallic reinforcement systems
- → Novel cement (CEM II/C and CEM VI)

Overall concept at a glance

EnDurCrete concept is based on the following novel technologies and tools:

- Novel CEM II/C and CEM VI cements
- Novel low cost smart fillers
- Advanced non-destructive continuous and testing tools and procedures
- New multifunctional coatings
- Concrete non-metallic multifunctional reinforcing systems
- Coupled experimental and computational approach for theoretical and experimental understanding of factors affecting durability



Overall Approach

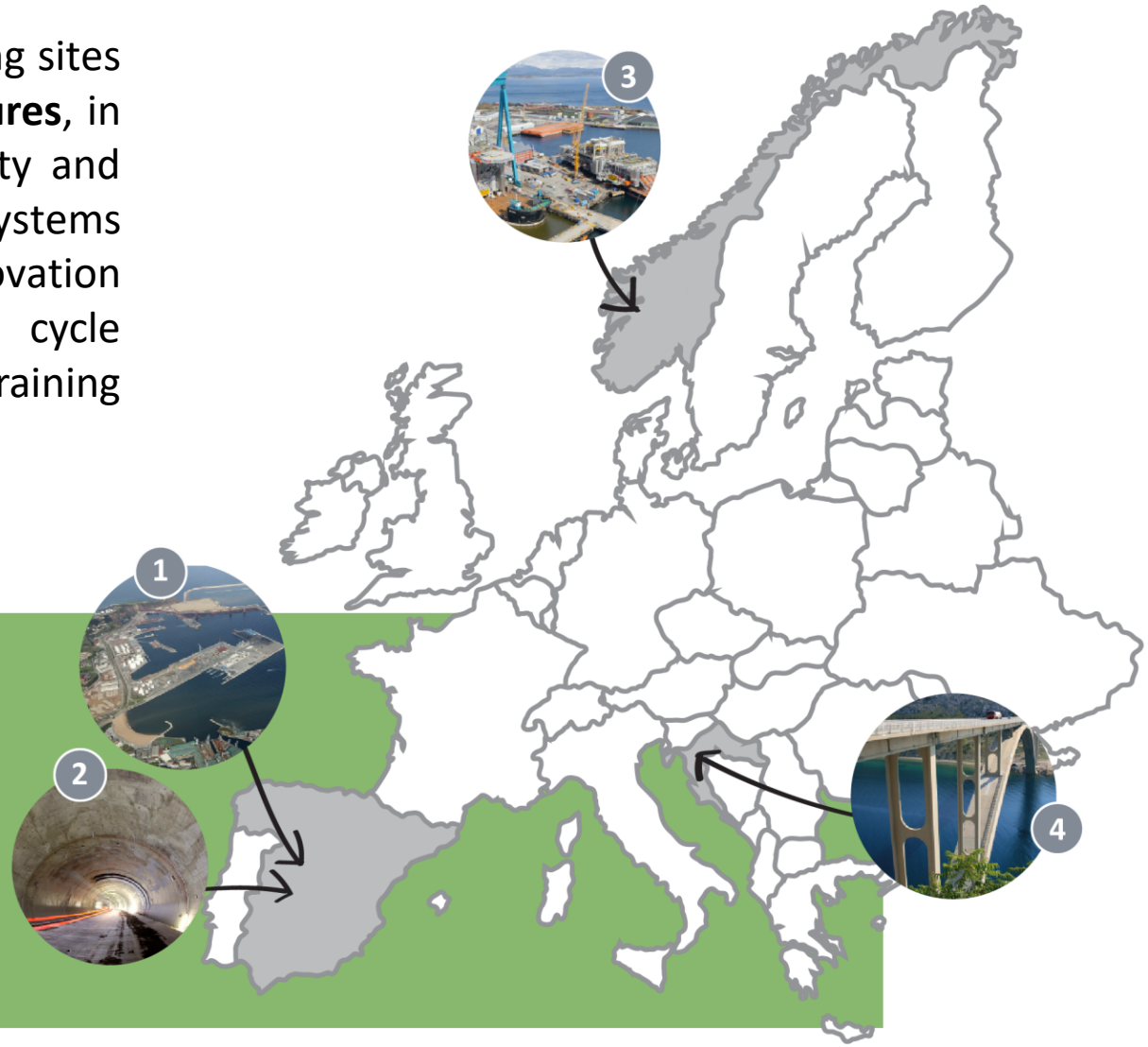
- Test functionality of **new concrete technologies** under severe operating conditions (4 demo-sites)
- Develop **experimental and numerical tools** to understand factors affecting the durability and to capture the multiscale evolution of damage
- Develop **models for service life prediction**

Expected Impact

- Strengthening **competitiveness of the European industry**, including in the field of “green” technologies
- Positive **LCA balance**
- At least **30% improved durability**
- At least **30% lower cost**

Demonstration

- **Demonstrators** will be tested in working sites of **tunnels, ports, and offshore structures**, in order to prove the enhanced durability and decreased cost of the new concrete systems in such critical applications. Innovation aspects such standardization, life cycle assessments, health and safety and training activities will be addressed.



1. **Port of Gijón “El Musel” in Spain**
2. **Mining tunnel facility in Leon, Spain**
3. **Ship Yard in Norway**
4. **Krk Bridge in Croatia**

Demonstration

1. Maritime port in Spain

Puerto de Musel, in Gijón - North of Spain, located in a small wharf in the North of the port where ACCIONA is currently carrying out research works. EnDurCrete specimens will be hold by metallic structures. The exposure classes to be considered are XS1, XS2 and XS3. Multiple testing zones are going to be adopted:

Aerial: specimens not in contact with water;
Tidal: specimens subjected to tidal cycles;
Submerged: specimens totally under water.

Demonstration

2. Tunnel in Spain

Demonstrator located at Fundación Santa Bárbara, La Ribera del Folgoso, Leon - North of Spain, 7 panels will be installed.

Demonstration

3. Offshore structure in Norway

Located in Stord, Norway. The exposure classes of offshore demo site are XS3 and XF4. Three different testing zones for specimens are being set-up:

Above splash zone: specimens not in contact with water;
Splash: specimens subjected to splashes of water;
Submerged: specimens totally under water.

Demonstration

4. Bridge in Croatia

Krk Bridge, Croatia, North Adriatic Sea in Croatia – the bridge has been built between 1976 and 1980, and since then it has gone under numerous maintenance and remediation measures, due to the corrosion problems. Due to the very aggressive marine environment, it is suffering from durability corrosion problems mostly caused by corrosion of reinforcement. The exposure classes of the bridge demo site are XS1, XS2, and XS3. There are multiple testing zones for specimens:

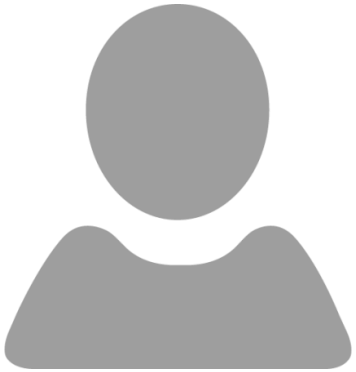
Splash: specimens subjected to splashes of water;

Tidal: specimens subjected to tidal cycles;

In-water: specimens totally submerged.

Contact Info

For further project information please contact:



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Thank you for your attention.

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