



NATIONAL INSTITUTE OF CHEMISTRY

75<sup>years</sup>

A scientifically excellent, established and breakthrough  
research institution based in Slovenia



HEALTH, ENVIRONMENTAL PROTECTION, CIRCULAR ECONOMY, SUSTAINABLE ENERGY, CLIMATE CHANGE, FOOD SAFETY

# NATIONAL INSTITUTE OF CHEMISTRY AT A GLANCE

With excellent research...

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Biotechnology

Life sciences research

Analytical chemistry

Nanotechnology

Food chemistry



Energetics

Theoretical and structural chemistry

Chemical engineering

Materials research

Highly qualified people

Health

Environmental protection

Societal challenges

Food safety

Circular economy

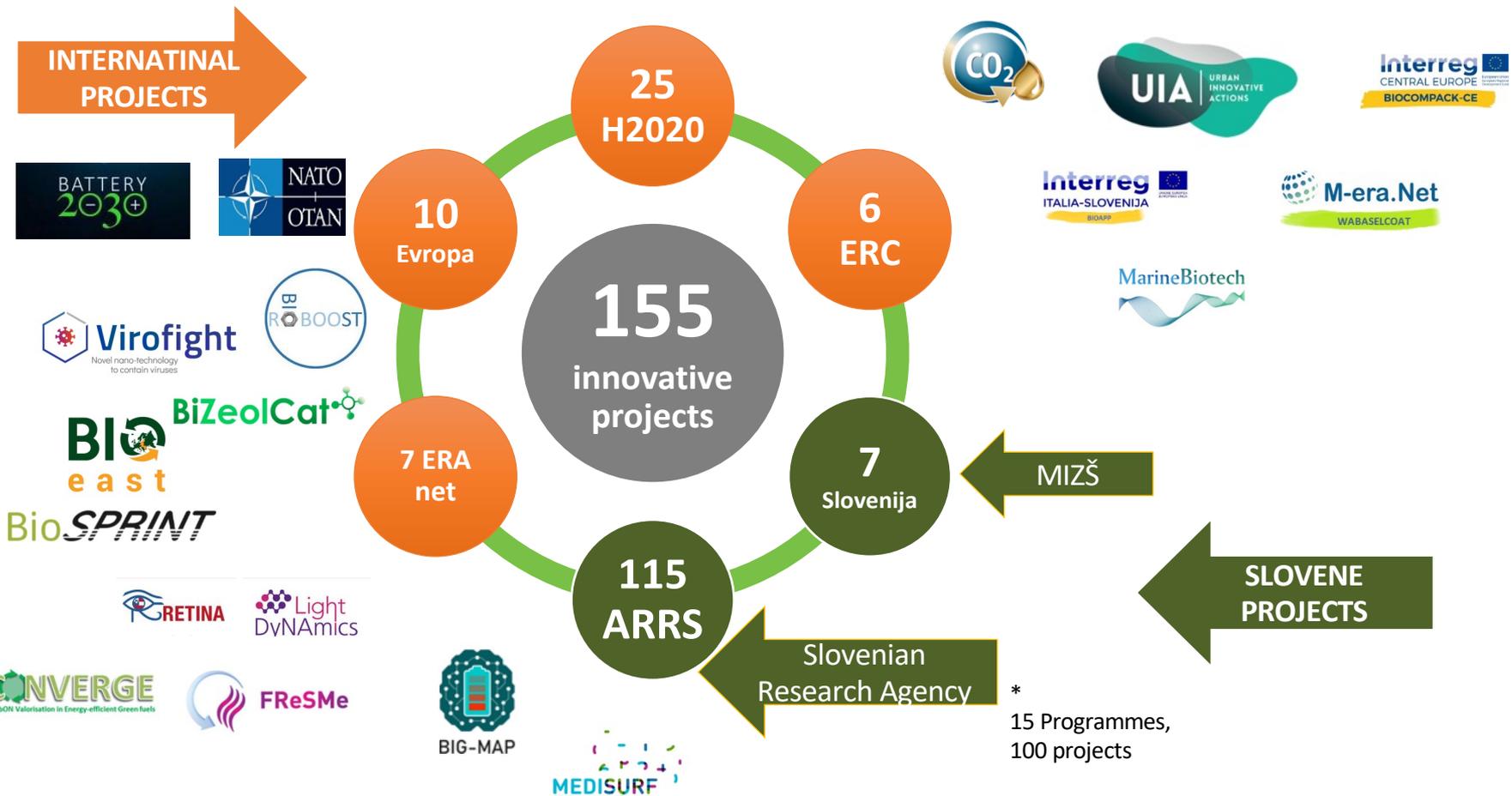
Climate change

Sustainable energy

...we create new knowledge and help solving societal challenges.



# SUMMARY OF CURRENT PROJECTS: PORTFOLIO



# HORIZON-CL2-2021-HERITAGE-01-01: Green technologies and materials for cultural heritage

**National Institute of Chemistry (NIC) is contributing to the call with the methods to conserve, preserve and restore monuments and artefacts with respect to different materials in a sustainable, green way. Our specific expertise:**

- 1. Protective coatings for various metals/alloys for preservation of cultural heritage** (sol-gel, on the basis of various polymers (fluoropolymers, polyurethanes, epoxy, acrylates ...).
- 2. Smart coatings** (hydrophobic, oleophobic, antistatic, antifouling, self-replenishing, flame retardant, **cool coatings for preservation of cultural heritage**).
- 3. Organic synthesis of special bio-based additives** as cross linkers or bulk resin modifiers in order to improve hydrophobicity, enable self-replenishing function, improve flame retardant property, cooling effect (patent AT510371) resulted in prolonged longevity and reduced biofouling activity.
- 4. Identification of materials, detection of structural changes** with Raman imaging and **determination of structural changes in protective coatings** during accelerated electrochemical exposure.



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**5. Advanced gas sensors for preservation of cultural heritage:** control of (micro)environment surrounding artistic artefacts.

- The presence of selected volatile organic compounds (VOCs) might imply on the commencement of artefacts' degradation/aging.
- Electrochemistry and associated electrochemical (bio)sensorics offer opportunities for creating a great variety of sensing approaches and tools.
- Electrochemical sensors and microsensor devices can operate individually or can be a part of more complex and integrated sensing systems.

Reference: [NanoRestArt project](#)

focused on **nanotechnologies** and **contemporary art**



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