

# InnoVative photocatalytic paintS for healthy envirOnment and eNergy Saving

LIFE19 ENV/GR/000100«VISIONS»

**PROJECT LOCATION: Greece**

**BUDGET INFO:**

**Total amount: 1,403,752 Euro**

**% EC Co-funding: 54%**



**DURATION: Start: 07/09/20 - End: 06/09/23**

**PROJECT'S IMPLEMENTORS:**

**Coordinating Beneficiary:** National Center for Scientific Research  
"Demokritos"

**Associated Beneficiary(ies):** Aristotelio Panepistimio Thessalonikis;  
Foundation for Research and Technology – Hellas; MICHPOULOS I. & CH. G.P; VITEX

# OBJECTIVES & SCOPE

**The main scope of the project** is the production of an innovative photocatalytic paint, which aims at improving the quality of the indoor environment while it will enable significant energy savings in buildings.

## **The project main objectives are:**

1. Development of a sophisticated Decision Support System (DSS)
2. Establishment of a start-up (or spin-off) company
3. Optimization and Upscaling of a novel photocatalytic material, TCM-1
4. Semi-industrial production of innovative photocatalytic paints (Photo-Paints)
5. Real scale application of three innovative
6. Assessment of the effectiveness of the Photo-Paint
7. Development of performance indicators Development of Management,
8. Communication and Dissemination strategy of the project.

## Key actions to achieve VISIONS objectives

### Action 1-FORTH (Sep.20-Feb.21)

Optimization and upscaling of synthesis root of the novel photocatalytic powder

### Action 2-VITEX (Feb.21-Aug.21)

Semi-Industrial production of Photo-Paints by mixing the optimized TCM-1 with 3 different kinds of paints

Application of the 3 types of Photo-Paints in:  
1. Demo-Houses  
2. Hellenic Naval Academies buildings

LAB Investigation of the Photocatalytic materials efficiency

NCSRD



### Action 6-NCSRD (Sep.22-Aug.23)

Establishment of a spin-off company

### Action 5- ENOLUTION (Aug.21-Dec.22)

Development of a Decision Support System (DSS)

### Action 4-AUTH (Sep.20-Dec.22)

- Computational Fluid Dynamics (CFD)
- Life Cycle Assessment (LCA)
- Cost Efficiency Analysis (CEA) & Cost Benefit Analysis (CBA)

# EXPECTED IMPACTS

**The expected impacts are divided in 5 main sectors:**

**1. Environment:** A degradation of up to 40% for NO<sub>x</sub> and 15% of VOCs from the application of the VISIONS Photo-Paint under real world conditions is expected.

**2. Energy:** Ventilation and HVAC systems are the major energy consumers in buildings. It is foreseen that for a 1000 m<sup>2</sup> building area a reduction of 10% in energy demand could be feasible.

**3. Innovation:** Optimization & application of TCM-1 catalysts for industrial building coatings capable for air de-pollution by visible light without producing any harmful by-products. Both optimized TCM-1 and Photo-Paint could be patented.

**4. Economy:** Demonstration of the effectiveness of the application will set the platform for a wider application to a number of indoor environments (homes, schools, hospitals)

**5. Dissemination:** Stakeholders and end users (Building Construction Companies, Chemical and Paints companies, Local and Regional authorities and the public at large) will take advantage of the outcome of the project as it will be translated into a Decision Support System (DSS). To that end characterization of the sustainability of each particular photocatalytic application could be achieved.

# POLICY IMPLICATIONS

- Taking into consideration the need which emerges from the **Article 10 of the LIFE 2014-2020 Regulation**, VISIONS attempts to design, develop, demonstrate and disseminate an effective policy.
- VISIONS could contribute to the recommendations on how to establish healthy and energy-efficient buildings in the European Union as described in the **“Promoting healthy and energy efficient buildings in the European Union”** report issued from JRC in 2017.
- The specific demonstration project will help the assessment whether or not photocatalytically active construction material may be a technology for achieving better indoor air quality throughout Europe. **VISIONS will prove that it could provide the basis for a European Directive on the usage of photocatalytically active construction materials in Europe.**
- Dealing with a holistic approach for demonstrating the effectiveness of the application of a novel Photo-Paint material as a viable mean for the improvement of the air quality in indoor environments, **it contributes to the European Union policy on environmentally sustainable development**

# CONTINUATION (REPLICATION, TRANSFER, MARKET UPTAKE)

The main action to safeguard the project **continuity** after its completion and it is foreseen to support the "next-day" of the project outcomes is the establishment of an academic spin-off company.

Due to its nature, the proposed methodology can easily be **reproduced and transferred** not only in the other indoor microenvironments but outdoors as well. As a result, VISIONS is strongly associated with the Article 114 of the TFEU (Consolidated version of The treaty on functioning of the European Union)

**The comparative advantage of VISIONS** outcome is not only the innovative product (VISIONS photo-paint) but also the full set of IT tools that accompanies it.

Global Photocatalyst Market by Application, 2014-2025 (in Million USD)

