

Innovative Photocatalytic Paints use on the improvement of Indoor Air Quality (IAQ) and Energy Consumption.

Expected results

Among the existing various techniques (purging with outdoor air, using ultraviolet germicidal irradiation etc.) to mitigate the problem of contamination in the indoor environment, photocatalysis, as an alternative technology, is considered to be the most safe innovative, effective, economic and promising solution.

VISIONS set realistic targets for the resolution of the IAQ and energy consumption issues, using an already proven innovative photocatalytic nano-material which is able to degrade air pollutants using Visible Light, as opposed to the existing products on the market, which operate by the use of UV radiation.

The proposed technological solution will be able to reduce up to 40% of specific air pollutants (e.g. NO_x, VOCs), translated to reduction on the demand for air-cleaning systems, air conditioning and other mechanical ventilation, leading to up to 10% less energy usage with a significant impact on the long-term energy demand and elimination of the overall socioeconomic costs due to the adverse health impact, caused by indoor air pollution.

Therefore, VISIONS sharing the same perspective with the signatories of the Covenant of the Mayors for Climate and Energy, constitutes of a potentially new tool for the effective reduction of indoor air polluting agents, improving citizens day-to-day life, while contributing to the National and EU coordinated efforts for the promotion of GREEN DEVELOPMENT technologies for less energy consumption.



InnoVative photocatalytic paintS
for healthy envirOnment and eNergy Saving

VISIONS - LIFE19 ENV/GR/000100

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Description: 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.

Budget Info:

Total amount: 1,403,752 Euro (EC Co-funding: 54%)

Duration: Start: 07/09/20 – End: 06/09/23

Partners:

National Center for Scientific Research DEMOKRITOS (Coordinator)

Foundation of Research and Technology – Hellas

Aristotle University of Thessaloniki

VITEX S.A.

EVOLUTION PROJECTS PLUS



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Improve
indoor Air Quality

Save energy
using innovative photocatalytic paints



Main objectives of the project:

1. Optimization and Upscaling of a novel photocatalytic material (VISIONS Photo-Powder) which was developed in lab-scale through an IP FP7 project (CLEAR-UP).

Optimization of the novel photocatalytic powders synthesis route which are activated in the presence of visible radiation and effectively degrade air pollutants.

2. Semi-industrial production of innovative photocatalytic paints (Photo-Paints) by incorporating the VISIONS Photo-Powder in various types of paints for real scale applications.

3. Real scale application of three innovative Photo-Paints in a set of existing Demo-Houses prototype demonstrator at the Hellenic Naval Academy Buildings.

Study of the efficiency of Photo-Paints in order to improve the air quality and energy efficiency of buildings.

4. Assessment of the effectiveness of the Photo-Paint for large scale applications through the application of a state of the art numerical modelling (CFD) for different scenarios for the application of the proposed covering technology.

5. Development of performance indicators for evaluation of the photocatalytic efficiency in terms of:

- the expected reductions in the concentration of specific pollutants in indoor environments
- the resulting reduction of the exposure of the inhabitants
- the expected improvement of the energy efficiency

6. Development of a sophisticated Decision Support System (DSS).

The System will serve as a multicriteria support tool towards studying the efficiency of the proposed solutions, processes and methods in future applications. It will be based on the outcomes of the photocatalytic activity, the Cost Efficiency Analysis (CEA), the Cost Benefit Analysis (CBA) and the Life Cycle Assessment (LCA).

7. Establishment of a start-up (or spin-off) company that will undertake the exploitation and promotion of VISIONS technologies and products (Photo-Paints & DSS).

The nanotechnology and products refined and applied in VISIONS have considerable commercial potential and the company will take over the promotion of the innovative materials and technologies (computational tools) to be developed as part of the project.

8. Development of Management, Communication and Dissemination strategy of the project.

During the implementation of communication actions of the project, innovative methods of dissemination and management of results will be applied.