

TECHNOLOGIES ENABLING ENERGY-EFFICIENT SYSTEMS WITH A LOW ENVIRONMENTAL IMPACT

INTRODUCTION

This special newsletter presents three H2020 projects, which propose a palette of complementary and/or alternative technologically advanced solutions for buildings that can lead to significant energy savings while ensuring low environmental impact.

It is well known that reduction of energy consumption and emissions in buildings is vital in meeting the EU's climate and energy targets for 2030 since buildings account for 40% of the EU's energy consumption, 36% of its CO2 emissions, and 55% of its electricity consumption.

The POWERSKIN+, SWITCH2SAVE, and PLURAL projects, funded by the European Union's Horizon 2020 research and innovation programme, offer combinable and versatile solutions to the issue covering all building typologies under different conditions.

POWERSKIN+

"Highly advanced modular integration of insulation, energizing and storage systems for non-residential buildings."



DOWNLOAD BROCHURE

SWITCH2SAVE

"Lightweight switchable smart solutions for energy saving large windows and glass facades."



DOWNLOAD LEAFLET

PLURAL

"Plug-and-use renovation with adaptable lightweight systems."



DOWNLOAD BROCHURE

OBJECTIVES AND TECHNOLOGIES

POWERSKIN+ presents a new vision for non-residential building facade systems, smartly combining energy efficiency and renewable generation while incorporating several state-of-the-art materials, products, and management solutions developments. Covering both transparent and opaque super-insulation elements, combined with thermal energy storage features and multi-functional nano-enabled coatings, along with solar cell building-integrated energy harvesting components and dedicated electric storage management solutions.

POWERSKIN+ add-on modular approach can be designed and tailored according to specific locations and energy-efficient requirements. Furthermore, each sub-technology is designed for the highest compatibility with standard manufacturing lines so that rapid implementation, adaptation to various use-cases, and market penetration are ensured.

SWITCH2SAVE targets active management of radiation energy transfer through glass based building envelopes by integrating transparent energy smart materials with switchable total energy transmission values (e.g., electrochromic (EC) and thermo-chromic (TC) systems). Unique and lightweight combined EC and TC smart insulating glass unit will be a breakthrough in performance, low-cost potential and increased design opportunities.

SWITCH2SAVE will accelerate the widespread implementation of energy smart glass and significantly contribute to the goal of a CO2 neutral building stock in the EU before 2050.

The **PLURAL** project aims to develop and demonstrate "Plug-and-Use" kits, meaning prefabricated facade kits that incorporate energy and control systems and take into account user needs. The key is to understand how to select and integrate various renewable energy technologies, incorporate them in specially designed prefabricated facade components and optimize their performance for different building types, climates, and socio-economic conditions.

PLURAL focuses on how to manufacture these kits while minimizing energy use and material waste. Evidentially, improving the energy performance of buildings calls for retrofit/renovation actions that not only meet the energy and environmental targets but also ensure minimum disturbance and indoor comfort for inhabitants.

PROJECT PARTNERS

Coordinator: INSTITUTO PEDRONUNES, PT

- FRAUNHOFER, DE
- FRIEDRICH-SCHILLER-UNIVERSITY, DE
- BRUNEL UNIVERSITY LONDON, UK
- FLACHGLAS, DE
- POLITECNICO DI TORINO, IT
- OXFORD BROOKES UNIVERSITY, UK
- CVUT - UCEEB, CZ
- FENIX TNT, CZ
- NAVODNIK, SI
- SAULE S.A., PL
- POLITECHNIKA WARSZAWSKA, PL
- AMSOLUTIONS, GR
- SAULE RESEARCH INSTITUTE, PL

Coordinator: FARUNHOFER SOCIETY INSTITUTES FEP and ISC, DE

- CHROMOGENICS, SE
- NATIONAL TECHNICAL UNIVERSITY OF ATHENS, GR
- UNIVERSITY OF WEST BOHEMIA, CZ
- SIA AGL TECHNOLOGIES, LV
- FASADGLAS BÄCKLIN, SE
- VASAKRONAN, SE
- GENERAL STATE HOSPITAL OF NIKAYA, GR
- VAN ROMPAEY SARA, BE
- AMIRES, CZ

Coordinator: NATIONAL TECHNICAL UNIVERSITY OF ATHENS, GR

- AMSOLUTIONS, GR
- MUNICIPALITY OF VARIS-VOULA-VOULIAGMENI, GR
- FENIX TNT, CZ
- OBEC KASAVA, CZ
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- BERGAMO TECNOLOGIE, PL
- DAIKIN AIRCONDITIONING, GR
- INTRASOFT INTERNATIONAL, LU
- INSTITUT FOR SOLAR TECHNOLOGY SPF, CH
- ITEC, SP
- PICH-AGUILERA ARQUITECTOS, SP
- IREC, SP
- AGENCIA DE L'HABITATGE DE CATALUNYA, SP
- ZRS ARCHITECTEN, DE
- RECUAIR, CZ
- DENVELOPS TEXTILES, SP
- RD RYMAROV, CZ

DEMOSITES



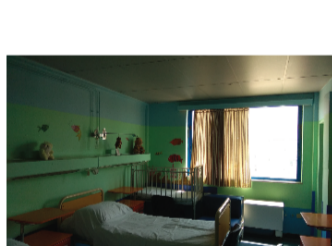
POWERSKIN+

POWERSKIN+ modular facade system will be demonstrated and validated in an operational environment in three real-size non-residential buildings in different European countries – Germany, the Czech Republic, and Portugal. The demo cases represent distinct climates and building practices, allowing to characterize and demonstrate the overall system potential in future real-case scenarios.



SWITCH2SAVE

SWITCH2SAVE will demonstrate its potential in two representative buildings – Greece's second-largest hospital in Athens and an operational office building in Uppsala, Sweden. The SWITCH2SAVE consortium will replace 50 windows and 200 m² glass facade area with the smart glass solution and will perform a full "before-after" comparison of the energy consumption for a one-year cycle in both buildings.

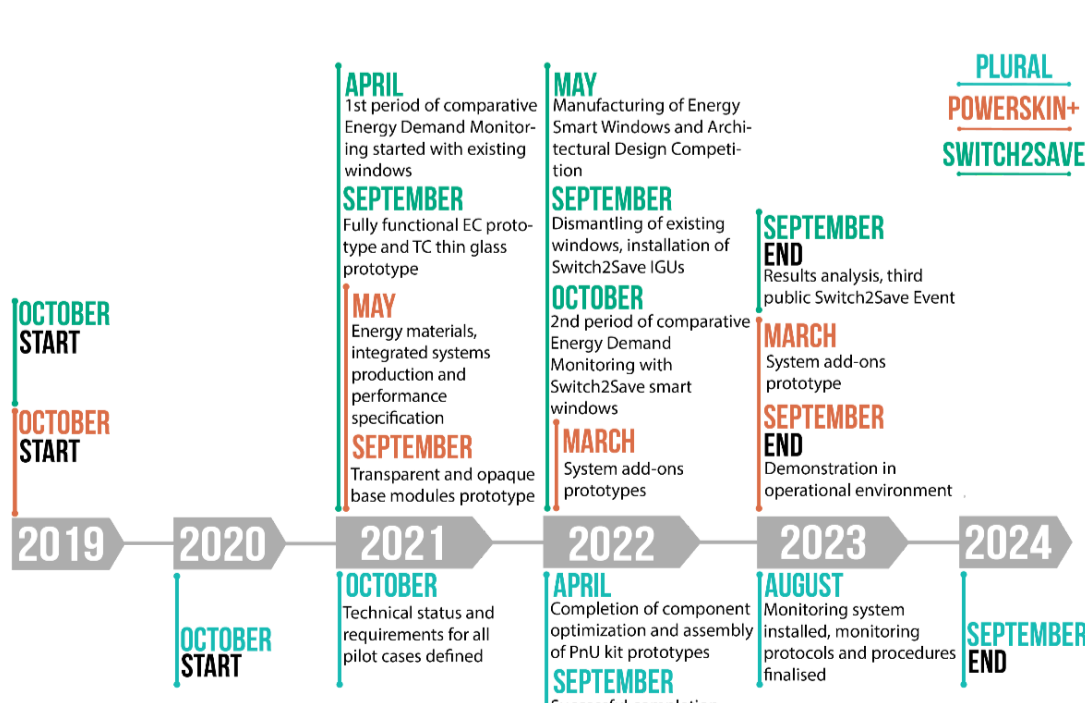


PLURAL

Three PLURAL concepts will be integrated in three different residential building sites, located in Greece, Spain and the Czech Republic, featuring different climate conditions and heating/cooling needs and user requirements, demonstrating versatility and robustness of the overall concept. Pre- and post-installation monitoring will allow quantification of energy, cost, environmental savings. Additionally, PLURAL includes three virtual demonstration buildings in Switzerland, Germany, and Sweden for simulating and validating performance and operation of the solutions under further conditions. The design and component selection will be supported by high-performance IT solutions including decision support tools.



TIMELINE



UPCOMING ACTIVITIES

POWERSKIN+, PLURAL - Sustainable Places 2021 [MORE INFO](#)

SWITCH2SAVE, PLURAL - 16th Advanced Building Skins Conference & Expo [MORE INFO](#)

POWERSKIN+, PLURAL, SWITCH2SAVE - Joint Webinar [PLANNING ONGOING](#)



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