NEWSLETTER
Issue 2.3, November 2017

Horizon 2020 Research and Innovation Action – InDeWaG Project

InDeWaG Demonstrational Pavilion - Sofia

Progress

InDeWaG project is entering its final phase. Many of the planning and designing stages of the project are already completed and now the consortium is prepared to start the industrial production of the first Water Flow Glazing (WFG) modules.

We aim to bring the water flow glazing technology into industrial ripeness. One of the main milestones towards that goal is the construction of a building with façades consisting of WFG elements. For that purpose InDeWaG partners have designed a mock-up and a demonstrational Pavilion that will serve as exemplary cases operating in real environment. These demonstrators will be equipped with elaborate monitoring systems. The gathered data from the measurements will be compared with the developed simulations to prove WFG performance and reliability.

Technical innovation

The demonstrator in Bulgaria will be the first of its kind using external and internal glass walls as heating and cooling devices. The circulating water inside the glass panes will provide the energy needed for the conditioning of the Pavilion. Air to water heat pump will ensure that the temperature of the water insight the WFG modules is kept within the predefined comfort levels. A roof-mounted photovoltaic system will cover the electricity demand of the Pavilion and assist in achieving Nearly Zero Energy Building standard.

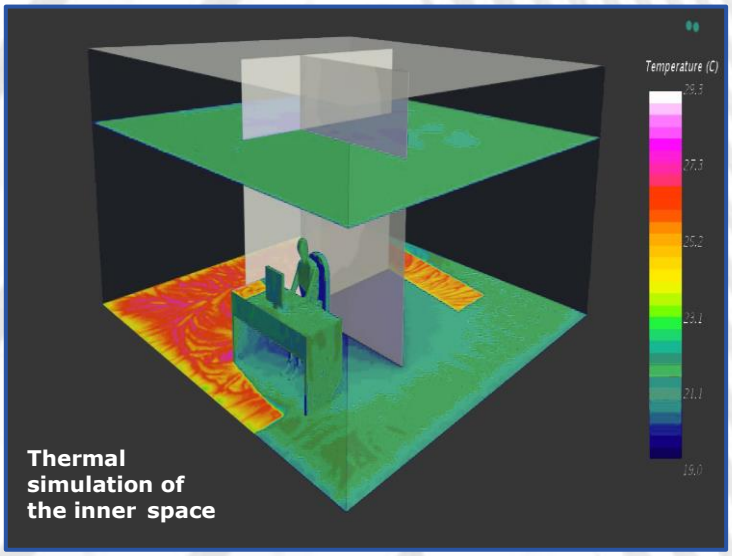
Design of the Demo-Pavilion in Sofia

The demonstrator will be constructed close to the Central Laboratory for Solar Energy and New Energy Sources (CL SENES) in the campus of the Bulgarian Academy of Science (BAS) located in Sofia, Bulgaria. Expected opening is planned in the first half of 2018

NEWSLETTER
Issue 2.3, November 2017

Horizon 2020 Research and Innovation Action – InDeWaG Project

During the summer months the excess heat coming from the sun will be captured by the water and dissipated using a heat pump, which will provide gradual supply of cooling energy during this period. The cooling of the inner space will be provided through the façade and the internal partition walls. Therefore the inhabitants will enjoy well-conditioned environment due to the comfort radiant cooling. Hence in the summer season the façade will operate as a solar collector and radiant cooling device at the same time.



Thermal simulation of the inner space


North and West facades


North and East facades

The heating and cooling of the Pavilion is provided through the water flow glazing elements and is supported by a simple small size HVAC system

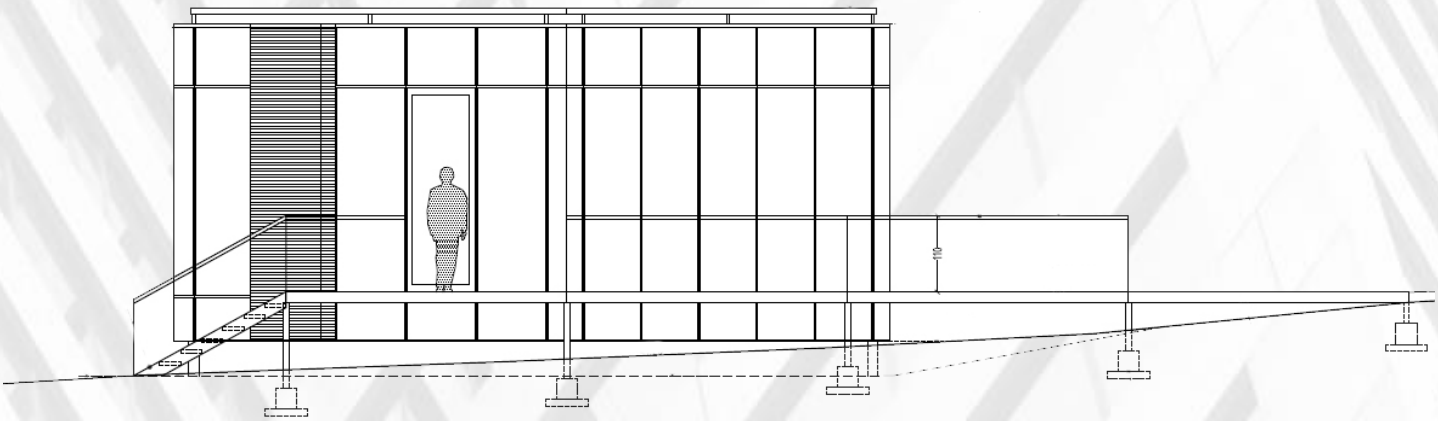
In the winter months heat absorbed by the water will be directly used to support the operation of the heat pump. In bright cool sunny days minimum amounts of auxiliary heating will be necessary; most of the incoming solar radiation will be stored as a heat in the water chamber within the façade glazing. Due to the support of the WFG modules the Heating Ventilation and Air-Conditioning (HVAC) system of the Pavilion will be sufficient to cover the heating demand without using any auxiliary heaters. WFG modules ensure better comfort sensation than the conventional convection heaters and result in an increase of the energy savings. The WFG modules in the outer and inner part of the Pavilion will provide optimum temperature control over the whole year.

NEWSLETTER
Issue 2.3, November 2017

Inside the demonstrator the space will be divided by interior partition walls also made of glazing elements with circulating water. The temperature of the water inside them will also be regulated and they will be used as radiant cooling or heating devices providing additional conditioning of the inner space. The Pavilion itself is meant to be a place for meetings, workshops and seminars as well as an InDeWaG showroom. The monitoring system will display in real time the behavior of the water flow glazing and will provide information about the energy performance of the Pavilion.

Design

The Pavilion is shaped like a glass box with a square plan measuring 7.24 m by 7.24 m. The glass envelope is composed of WFG modules on the East, West and South façade, while the North façade is opaque. The roof, floor and north facade are well insulated and will contribute to the low energy requirements of the Pavilion, which is designed to achieve nearly Zero Energy Building standard.



The facades are with clean orientation at 4.5 m height from floor to ceiling. The glass surface of a single WFG within the frame is 3.9 m^2 (3 m by 1.3 m). The Pavilion lies on four single foundations and is elevated from the surrounding terrain without changing its natural topography. Exterior stairs and an elevated sidewalk are leading to the pre-entrance area, all made of galvanized steel structure covered with slotted steel sheets. The Pavilion's connection with the southeast pedestrian alley is done by a horizontal walkway, which also gives access to disabled persons.

Objectives

Energy strategies as well as construction and production processes will be validated through extensive testing and monitoring of the demonstrator under real conditions. The gathered data will be analyzed in respect to the outer conditions and the performance of the WFG modules. After the first year of operation the total energy savings will be evaluated.

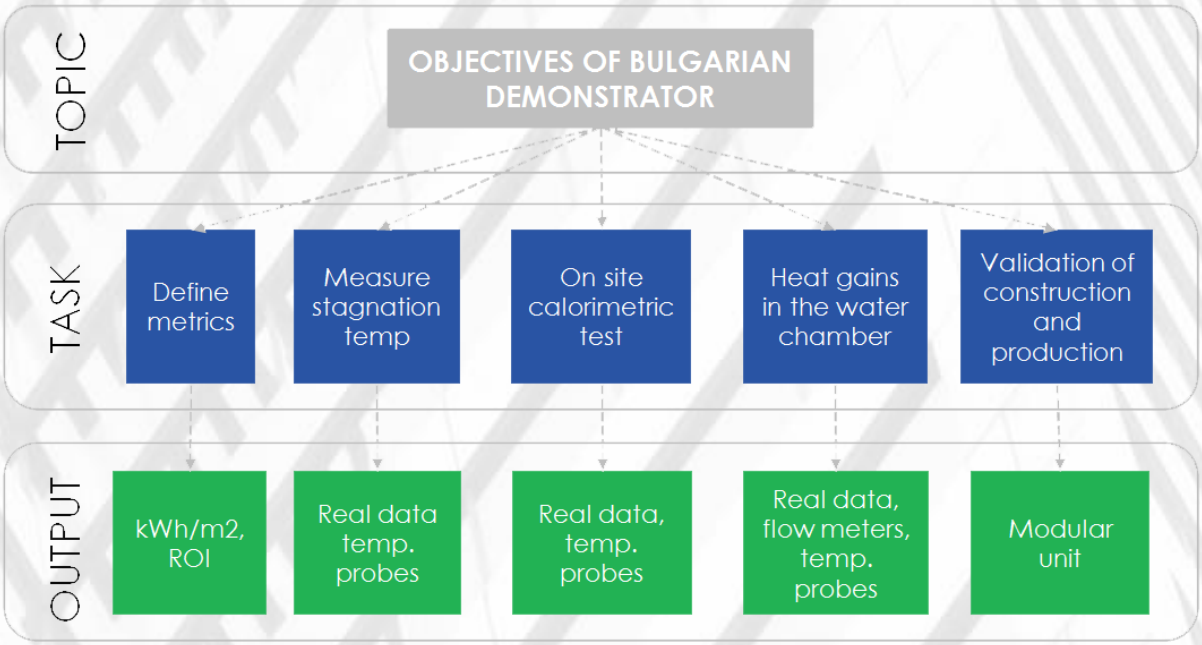
InDeWaG

European Commission

NEWSLETTER

Issue 2.3, November 2017

Horizon 2020 Research and Innovation Action – InDeWaG Project



This project has been funded by the European Commission under Horizon 2020 the EU Framework programme for research and innovation, Call - H2020-EE-2015-1-PPP. The project type is Innovation Action Project, Grant agreement number: 680441, InDeWaG - Industrial Development of Water Flow Glazing Systems. This document does not represent the opinion of the European Union, and the European Union is not responsible for any use that might be made of its content.

PARTNERS

COORDINATOR

University of Bayreuth
e-mail: coordinator@indewag.eu

PROJECT INFORMATION

Acronym: InDeWaG
Grant number: 680441

www.indewag.eu