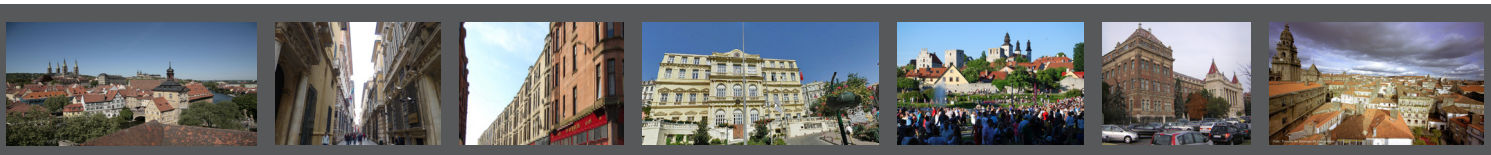

ENERGY EFFICIENCY FOR EU HISTORIC DISTRICTS SUSTAINABILITY

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement No. 314678

NEWSLETTER NO. 4

EDITORIAL

Dear Friends,
Welcome to the 4th edition of our newsletter. In the previous edition, we provided information on first results of the new solutions and this time we will focus on the Decision Support System (DSS), as well as on the Glasgow (United Kingdom) case study. We hope you will enjoy the reading and thank you for the trust received till now. We hope you will keep following us!

Enjoy!

Isabel Rodriguez-Maribona,
EFFESUS coordinator

International Symposium & International Construction Trade Fair BAU 2015

EFFESUS is half way through its envisaged project run time and significant progress has been made regarding technological developments, supply concepts for renewable energies as well as decision making strategies in the complex context of historic districts. It was time to reflect the outcomes and present them to a professional audience for discussion. Therefore over 50 participants attended the symposium at the International Construction Trade Fair BAU 2015 in Munich, Germany. On January 24th we presented in the B0-Forum the interim project results, the further development paths as well as our vision on sustainable and energy efficient historic urban districts.

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Case Study in Focus: *Glasgow*

Fact Sheet: Case Study Glasgow

Country	United Kingdom
Climate	Temperate oceanic (Cfb)
Selected District	Yoker Street
Case Study Level	Building intervention
Technologies to be installed	New advanced blown-in insulation aerogel
Local coordinator	Historic Scotland
Manufacturer	A. Proctor Group

Glasgow is located on the river Clyde, close to Scotland's Atlantic coastline. The climate is mild but wet. Climate change research indicates that the amount of precipitation is likely to increase in the future. Together with often strong winds and limited solar gains (particularly during the winter months) this results in an increased risk of dampness in building materials / elements and fabric deterioration due to driving rain. These climatic influences have to be taken into account in the trialling of the new aerogel insulation products in the Glasgow Case Study.

Today we have the chance to talk to Iain Fairnington, Technical Director of the manufacturer A. Proctor Group about the ongoing activities in Glasgow.

***EFFESUS:* What is the main purpose of the Glasgow case study?**

Iain Fairnington: The main purpose is to test a retrofit application of advanced aerogel as a blown in insulation behind the plaster/plasterboard finishes on a traditional solid wall construction. The aim is to develop an insulation that will be unaffected by moisture, allows the wall to breathe, provides maximum thermal value and is in a form that can be injected into the small cavity behind lath and plaster. Testing will include moisture vapour transmission rates, settlement observations and heat loss.

***EFFESUS:* What are the main advantages of the innovative aerogel insulation developed in EFFESUS?**

Iain Fairnington: Aerogel is growing in its popularity due to its high thermal performance, vapour permeability and water resistance. These are important properties when trying to insulate historic buildings. An additional advantage is that whilst the material is unique, the installation methods are such that existing insulation installers do not require any addition equipment or skills. The damage to the existing plaster finish is kept to a minimum, and disruption to the homeowner is reduced as installation is relatively quick and unobtrusive.

***EFFESUS:* What are the main challenges in regards to the development of the insulation aerogel?**

Iain Fairnington: There were several main challenges to developing a blown in aerogel. Firstly, the nature of the typical wall constructions found in Scotland – e.g. sandstone and granite – are permeable to water, therefore the insulation had to be a type which was unaffected by moisture. Traditional finishes of lath and plaster meant that, unless you were removing this completely, there was only a small cavity where the insulation could be installed. One of the main challenges was converting the aerogel insulation into an acceptable fibrous form, which could then be blown into the cavity. Tests involving wood chippers and industrial shredders did not produce an acceptable material. Collaboration with a blowing machine manufacturer resulted in the current spacefill.

***EFFESUS:* What is the current state of the Glasgow case study? What happened so far?**

Iain Fairnington: BCA Insulation has successfully installed the insulation at two parts of the property. Unfortunately, at window 5b, the new plaster-on-lath finish cracked, due to the pressure from the injection. This was believed to be due to the fact the laths were installed very close together and that the lime plaster finish only had two weeks drying time. The plaster also appeared to be thinner than expected. BCA have since been into the property and striped back the damaged plaster, removed the laths and have re-installed. We are anticipating that the panel will be ready for insulation injection towards the end of March.

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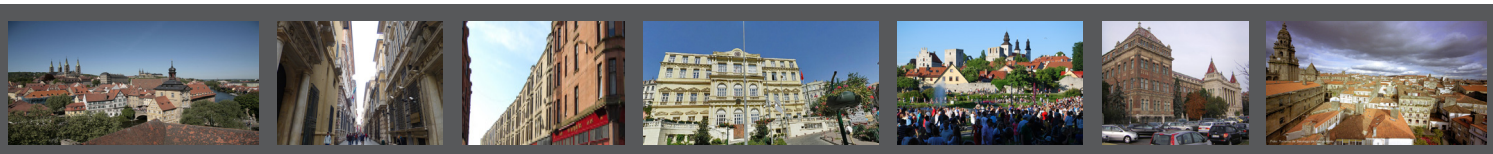

***EFFESUS:* Which benefits arise for the Glasgow Case Study from the international cooperation in EFFESUS?**

Iain Fairnington: This project has been a collaboration between several parties, including University of Stuttgart, who tested the thermal conductivity of the spacefill. They were also able to assess the potential drop in performance when the material is processed into a bloweable form. A particular benefit was also the fact they have a blowing machine in their factory.

Red-SRL are an Italian company who are providing and installing the monitoring equipment at the property in Glasgow. This will monitor performance over a whole year. Another manufacturer in Italy is also doing further trial of cutting the material into 5mm cubes.

***EFFESUS:* How can the results and lessons learned from this case study being transferred to similar cases in United Kingdom or other countries?**

Iain Fairnington: A full year's monitoring will provide invaluable information, recording real-time performance over all conditions and seasons. This can then be used to assess suitability and expected performance in similar applications. This is a unique test situation which will allow a product to be developed that can be used in historic buildings without altering the look of the building, or encroaching into roomspace.

Development of the Decision Support System

The EFFESUS Decision Support System (DSS) will be developed as an open, multi-tier, flexible system that will support selecting and prioritizing energy efficiency interventions in historic districts. It will be developed as a web application with the use of Microsoft Visual Studio development environment. Its programming architectural pattern will be MVC (Model-View-Controller). The DSS will implement the algorithms and methods defined for each Level of Decision Making (from 0 to III) and accuracy levels (from 0 to 5) in the different phases (diagnosis, decision making and management) identified in the methodological framework.

Objectives:
The main objective is the functional definition and implementation of a technology architecture that makes a unified access to the different modules through the Decision Support System available. This mayor objective can be divided into the following secondary objectives:

- The identification of main users.
- Definition of the overall system architecture, including the software development pattern, the logical and physical architecture, the identification of main modules to be integrated in the EFFESUS system.
- Definition of the main interfaces between integrated tools and modules, as well as adetailed definition of the external tools to be integrated in the EFFESUS DSS.
- Detailed definition of the graphical user interface (GUI), including the generation of mock-ups.
- Definition of the main functionalities of the system, describing the logical system flow, data organization, system inputs and outputs, processing rules, and operational characteristics of the system.
- Data modelling and representation, as the first layer of interaction with databases used by the EFFESUS DSS.

Current State of Development
There are significant steps already been done towards the DSS development. The major one consists of the detailed definition of the most parts of the DSS such as the software development pattern, the main functionalities of the system, the logical system flow and operational characteristics of the system. In addition, a lot of work has been done in some modules of code and the DSS database design.

Outlook/Further Steps
Further steps of the development include the coding and improving of the major modules of code in order to cooperate smoothly as parts of an overall system. Moreover, the detailed definition and implementation of the graphical user interface would be implemented in parallel in order to create a consistent and responsive graphic user interface.

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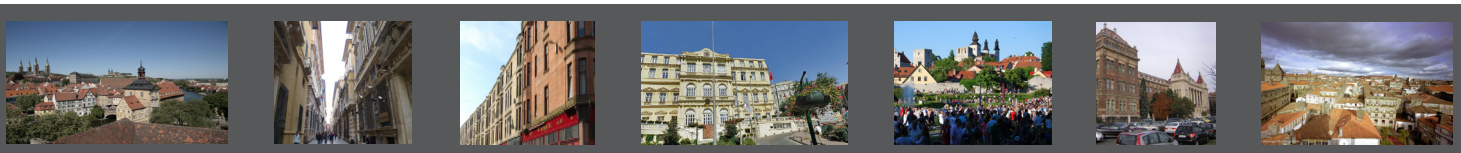

Partners in Focus:

ACCIONA Infrastructures – Spain

With more than 100 years of experience in the construction industry, ACCIONA Infrastructure covers all aspects of construction, from engineering to project execution and maintenance. The company is now a leader in R&D and innovation and is ranked among the leading construction companies in the world recognised for its practice of implementing the most advanced and innovative techniques and technology. As a large company with experience in rehabilitation processes ACCIONA is leading Work Package 7, the demonstration of the innovative EFFESUS solutions in real case studies. It will also develop novel solar radiation selective coatings compatible with historic building facades and roofs.

Uppsala University (UU) – Sweden

The Department of conservation at Uppsala University – Campus Gotland offers courses and bachelors programs in applied conservation. Research is focused on sustainable management of cultural heritage, with a focus on energy efficiency and indoor climate. Uppsala University will provide expertise to EFFESUS mainly by taking the leadership of Work Package 1 (European urban and building stock structured categorization and multiscale data management model). It will also contribute significantly to Work Package 5 (Conceptualisation, results integration and strategies for decision-making) and will participate in the optimisation of new indoor solutions.

EURAC RESEARCH – Italy

The Institute for Renewable Energy at EURAC research works mainly in the field of system integration of energy efficiency and renewable energy solutions. One of the institute's focuses is energy efficiency in historic buildings. The expertise on the special demands of these buildings and suitable solutions at building scale is what EURAC brings into EFFESUS as well as obviously the link to the EURAC coordinated research project 3ENCULT on energy efficiency in historic buildings. Due to its experience EURAC will lead Task 2.1 (Identification of existing technologies at building scale) and Task 4.4 (Lab and outdoor testing of new materials developed).

Please visit our website for information about recent and upcoming events: ***www.effesus.eu/events***

Project Partners:

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EFFESUS Key Facts

Project Acronym:	*EFFESUS*
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Project Duration:	*09/2012 - 08/2016*
Funding Scheme:	*Seventh Framework Programme - CP (FP7-2012-NMP-ENV-ENERGY-ICT-EeB)*
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