EINSTEIN

University of Ulster and Scandinavian Homes Ltd collaboration in FP7

Introduction

The European Commission funded FP7 project 'Effective Integration of Seasonal Thermal Energy Storage Systems in Existing Buildings' - EINSTEIN - aims to develop, evaluate and demonstrate a low energy heating system based on Seasonal Thermal Energy Storage (STES) systems. In this case study Dr Shane Colclough, a specialist researcher in the University of Ulster, shares his experience on the FP7 project and offers advice for those looking to participate in the current Horizon 2020 Programme.

About the project

www.einstein-project.eu

The overall aim of the three year project is to combine Seasonal Thermal Energy Storage (STES) Systems with heat pumps to satisfy the space heating and domestic hot water (DHW) requirements of existing buildings, thereby drastically reducing energy consumption. Each organisation in the consortium brings different knowledge and expertise that when combined will result in a system that can be retrospectively installed into existing buildings. This system aims to collect and retain enough energy during the summer to heat the building throughout winter with the use of a heat pump to fully exploit all stored heat.

Two critical elements of the proposed EINSTEIN system are STES systems, which are particularly prevalent in Northern Europe and heat pump technology, which is used globally. However, the integration of both has previously not been optimised in a combined system. This is one of the main breakthrough elements of the EINSTEIN project. To realise this integration, an appropriate heat pump needs to be developed alongside an evaluation tool, both of which form part of the project's undertaking. The consortium believes that there is the potential to realise energy savings of up to 70% compared to conventional existing thermal systems.

Acronym	EINSTEIN
Start	2012
End	Ongoing
EU Grant Aid	€9million

EINSTEIN Spokesperson

Dr Shane Coclough, specialist researcher into seasonal energy storage at the University of Ulster / Scandinavian Homes representative

Project partners

University of Ulster, Coleraine

Scandinavian Homes Ltd, Galway

Tecnalia, Spain

Acciona Infraestructuras, SpainDappolonia S.p.A, Italy

Mostostal Warszawa, Poland

SIG-Solites, Germany

CIM-mes Projekt, Poland

University of Stuttgart, Germany

Airlan, Spain

TNO, Germany

GIROTZE, Spain

ICOP, Italy

Architectural Spies, Bulgaria

Formento San Sebastian, Spain

Mazocia Energy Agency, Poland

Arteaga Foundation, Spain

Why engage in collaborative EU R&D and innovation projects?

Dr Colclough explains: *"As a representative of both industry and academia within the realms of the EINSTEIN project, I can see the direct benefits of involvement to each discipline.*

"European projects offer unique opportunities."

"For academia, it grounds cutting-edge research in practicality, turning thought from theory into a feasible solution.

"For SMEs, it offers access to leading research and thought leadership with the chance to apply this knowledge to a business context, which can ultimately

offer an edge against competitors. Even in the scope of academic to academic, the process is mutually beneficial as it encompasses the transfer of knowledge and skills which can consolidate learning; accelerate breakthroughs and in some cases, offer a new perspective which can change the course of research."

Positive outcomes of the project

"Since the project commencement in 2012, we have advanced to the stage where we now have three working models which are being monitored. The STES installation in Sweden went live in the summer of 2013 and the plants in Spain and Poland started collecting solar energy for storage in the summer of 2014.

"A key benefit for those adopting the EINSTEIN system will be the provision of low-cost and low carbon energy leading to an environmentally-friendly and cost-effective means of achieving zero-rated buildings. This is a highly compelling proposition as governments strive to achieve stringent carbon emissions' targets.

"We are at an exciting juncture in the project at the moment and we expect there will be some major learnings and developments within the next six months. "Together we have the knowledge to deal with any issues that do arise.

"Being a part of a major project such as this can lead to even more collaborative opportunities for researchers and to new product development prospects for SMEs."

"Everyone involved is working at the top of their game and is the specialist in their chosen field. "In the past the different aspects of our project have been investigated and in some cases, applied to energy systems, but never amalgamated with each other. This is a new offering and each element is dependent on the next with all playing a part in the overall system.

"As an integral element to its involvement in this project, Scandinavian Homes has put a solar DHW and space heating system incorporating an STES in to operation in a Swedish block of flats. Already a leader in its field, the company now has an even more defined edge over competitors with links to so many other experts across the consortium."

How can InterTradeIreland help?

With such a focus on collaborative projects through European funding streams, linking with possible consortium partners may feel like a 'needle in a haystack' scenario for some academics or companies.

Dr Colclough confirms: *"There are so many specialists within academia and industry that it can be hard to know, outside your own field, what people are doing and that is where support organisations can help."*

Dr Colclough continues: "*With an expert overview of industry and academia on the island, InterTradeIreland is in a prime position to match complementary partners right across the island.*

"Their network is extensive and comprises the cream of the crop.
Dr Colcough adds: "When thinking of investigating European funding, such as the current Horizon 2020 streams, it is through organisations, such as InterTradeIreland, that the first seeds of consortium-building can be sown.

"Opportunities are there for realisation through their extensive networks – you never know, your perfect collaborative partner could even be out there looking for you at this very moment!"

Dr Colclough's advice to those thinking of participating in European projects: *"Start early and approach support bodies for advice on collaborative working."*

University of ULSTER

SCANDINAVIAN HOMES