



<b>GRANT AGREEMENT NO. :</b>	636717
<b>PROJECT ACRONYM:</b>	IMPRESS
<b>PROJECT TITLE:</b>	New Easy to Install and Manufacture PRE-Fabricated Modules Supported by a BIM based Integrated Design Process
<b>FUNDING SCHEME:</b>	SME Collaborative Project
<b>THEMATIC PRIORITY:</b>	H2020-EE-2014-1-PPP
<b>PROJECT START DATE:</b>	1 <sup>st</sup> June 2015
<b>DURATION:</b>	42 Months

## DELIVERABLE 7.4

### First Dissemination Workshop

Review History			
Date	Submitted By	Reviewed By	Version
14/06/2016	Nick Purshouse (IES)	Luis Torres (AH)	1
21/06/2016	Nick Purshouse (IES)	Oliver Kinnane (QUB)	2
21/06/2016	Nick Purshouse (IES)		3

Dissemination Level		
<b>PU</b>	Public	X
<b>PP</b>	Restricted to other programme participants (including the Commission Services)	
<b>RE</b>	Restricted to a group specified by the consortium (including the Commission Services)	
<b>CO</b>	Confidential, only for members of the consortium (including the Commission Services)	

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## **EXECUTIVE SUMMARY**

This report showcases the first dissemination workshop event held for the IMPRESS project as part of Work Package 7 'Dissemination and Exploitation'. A key objective of the work package is dissemination of the IMPRESS objectives and results at various levels to suit particular audiences e.g. decision and policy makers at national, European and international levels; business managers and leaders; technical researchers and developers.

To this end, the project joined with an all-day seminar held by IES in Guinness Store House, Dublin 18th November 2015 focussed on 'Operational Energy Management of the built environment' with academics and professionals from the industry participating. This seminar discussed the aspects of the built environment, with respect to the operational energy management of buildings, groups of buildings, districts and cities. As part of this, the IMPRESS project held a workshop to introduce the project, and also to gain stakeholder feedback on the challenges faced in a renovation with prefabricated panels project and how they may be overcome.

The report is structured to give an overall introduction to the Work Packages, deliverable and workshop aims and objectives. It then goes on to demonstrate the content and results from the workshop, before explaining in the conclusion how the results will be used and fed into the following tasks in the project.

## 1 Introduction

This report showcases the first dissemination workshop event held for the IMPRESS project as part of Work Package 7 ‘Dissemination and Exploitation’. A key objective of the work package is dissemination of the IMPRESS objectives and results at various levels to suit particular audiences e.g. decision and policy makers at national, European and international levels; business managers and leaders; technical researchers and developers.

During the first 12 months of the project the focus of partner’s work has been on research and development of the innovative prefabricated panels, the best methods to produce these and research into the most appropriate components (anchorings, fixings) to integrate the panels with the demonstration buildings. A large amount of work has also gone into understanding the demo buildings themselves to ensure the panels and components would achieve the desired energy improvements and aesthetic finishings.

### 1.1 The Dissemination Workshop

At the time of the dissemination event in November 2015, there were not any suitable results that the project wished to broadcast, however there was a pressing need to conduct stakeholder analysis and gain feedback on the project from a group outside of the project consortium.

To this end, the project joined with an all-day seminar held by IES in Guinness Store House, Dublin 18th November 2015 focussed on ‘Operational Energy Management of the built environment’ with academics and professionals from the industry participating.

This seminar discussed the aspects of the built environment, with respect to the operational energy management of buildings, groups of buildings, districts and cities. The morning session focussed on buildings and groups of buildings, including discussions surrounding the issues of calibration of building energy models to inform operational building use; fault detection and diagnosis in existing buildings to ensure buildings are operating as efficiently as they can; and the in-use optimisation of buildings using algorithms for prediction and automation of building systems taking into account uncertainties such as external weather and behaviour of building occupants.

As part of this, the IMPRESS project held a workshop to introduce the project, and also to gain stakeholder feedback on the challenges faced in a renovation with prefabricated panels project and how they may be overcome.

The afternoon session then focussed on the district and city levels. This included discussions surrounding urban modelling for energy use; issues surrounding the smart grid and integration of centralised renewable systems for groups of buildings and localised districts; and finally optimisation and demand response for buildings at a district and city scale.

## 2 Workshop Objectives and Structure

As part of Work Package 4 ‘New Iterative Design and BIM Methodology for Prefabrication Renovation’, there was an initial requirement to conduct analysis of stakeholder interests, drivers and motives (Task 4.1), and although a large body of work had been done via desktop research and questionnaires with people from inside and outside of the consortium, it was agreed that it would be a valuable exercise to gather more detailed collective feedback from interested parties on areas that the research was suggesting the industry had particular issues with or gaps to fill.

The purpose of this workshop was therefore to take different stakeholder groups and from their perspective identify the key constraints, concerns and challenges that the ‘external’ stakeholders might face in a renovation with prefabricated panels project, and also to highlight possible solutions that the project could then take forward into the following tasks and activities, such as in a new design and BIM methodology for renovations of this nature.

The focus was given to four stakeholder groups (private sector building owners, financial contributors, contractors, end-users) because the prior research had indicated that they were important stakeholders, and also because their representation was lacking from the online survey already conducted. The workshop consisted of four parts:

- Project Introduction and workshop aims
- Identification of key constraints, concerns and challenges
- Identification of solutions of the above
- Where these solutions fit in the process map and which stakeholders it might affect.

The participants of the seminar were split into four teams (A, B, C, D) of approximately ten people. Each group was facilitated by someone from IES, and had to play the role of a particular stakeholder and through this lens, identify the above as though they were the stakeholder in a renovation project. In addition, to make the procedure interesting for the participants and force them to think from various perspectives, for every step of the process the roles were rotating clockwise. For example, Team A spotted their concerns as they were financial contributors, but in the second step, Team B had to identify solutions based on Team A’s work in the previous part.

There were over 40 people in attendance from the following types of organisations (a full list of organisations can be seen in Annex 1).

- Academic/Research Institute
- Engineering – Civil & Electrical
- Building Energy Consultancy
- Multi-Disciplinary Consultancy
- Information Technology
- Architect
- Property Management & Development

The photos below show the work shop in action:

Figure 1 Photos showing workshop in action



### 3 Workshop Results

The findings of the workshop are presented below, and divided in four sections, one for each of the stakeholder groups examined.

#### 3.1 Stakeholder Group A - Building Owners

According to the experts participating in the workshop, the main concern of a building owner is whether the cost and the associated payback time is too high, and it was suggested that this could be tackled by seeking advice on lower cost and best value/performance options. The second key concern is associated with the durability of the panels after the renovation, and the confidence of the building owner in the panels performance. This could be improved by using case examples and research to support manufacturers' life expectation of the panels, combined with usage of EU level certified materials in the panels' manufacturing.

Another challenge for the design team which is a major concern of the building owner is the disruption of the people using the building during the renovation. This could be moderated by effective scheduling and out-of-hours work, and by using BIM modelling to support clash detection in the early stages of the project. Team A also mentioned that the aesthetics of the building's façade after the renovation is a key concern for the building owner and then Team B highlighted the necessity of a three dimensional graphical representation of the building to demonstrate the aesthetics of the building after the renovation. Finally, the challenge of increasing the building's lifetime was noted with where the solution ties into Building Management System (BMS) for monitoring. The table below summarises the output from this group:

*Table 1 Challenges in prefabrication renovation from the perspective of a building owner and the associated proposed solutions by the participants in the workshop*

Challenge	Suggestion/Solution	Which stakeholders are affected	In which stage of the process map do the suggestions fit in
Cost/Payback too high	seek advice on lowest cost options and best value/ performance	Designers, Engineers, Architects, Manufacturers	Initiation & Viability
Panel lifetime/lifecycle	Case studies/research/ guarantee to support manufacturer life expectancy of the panels	Facility/Energy Managers, Tenants, Manufacturers	Operation & Maintenance
	Total lifecycle of materials used (EU level certification or standards for materials)		
Disruption to building	Out of hours work	Installers, Tenants, Building Owners	Construction & Installation
	Segregate building to schedule works		
	Stage works to minimise works		
Aesthetics	3D model to demo aesthetics, graphic representation, full sketch of lighting etc.	Designers, Engineers, Architects, Manufacturers	Design & Specification
	planning approval		
Building lifetime (lifecycle extension)	Tie into BMS for monitoring	Facility/Energy Managers, Tenants, Building Owners	ALL

### 3.2. Stakeholder Group B - End Users

Team B was highlighted five major concerns and challenges of the end-users during a prefabricated building renovation. The biggest one was thermal/visual comfort which could be guaranteed by pre/post assessments and good communication between the renovation team members such as the manufacturers and the installers. Also good communication can minimise the disruption of the end users during the renovation, while the impact of the existing services/conditions and the cost of works are also concerning the end-users of a building to be renovated. Finally, the aesthetics is also a concern and the Team C, who was responsible to identify suggestions, proposed design/concept images and mock ups, while a picture of what the new façade would be like could cover the scaffolding during the renovation. The table below summarises the output from this group:

Table 2 Challenges in prefabrication renovation from the perspective of an end-user and the associated proposed solutions by the participants in the workshop.

Challenge	Suggestion/Solution	Which stakeholders are affected	In which stage of the process map the suggestions fit in
Comfort (visual/thermal)	good installation and product team	Installers, Equipment Suppliers, Contractors, Sub-contractors, Designers, Manufacturers, Statutory Authorities	Design & Specification Construction & Installation
	good communication between installers and manufacturers	Installers, Manufacturers	Manufacturing Construction & Installation
	pre/post assessments		Operation & Maintenance
Disruption	Communication/dialogue	ALL	ALL
	Alternative accommodation		Construction & Installation
	Scheduling and communication between occupants and works team		Planning Construction & Installation
Cost of works	Fixed price	Financial Contributors, National Governments, Local Authorities, International Authorities	Initiation & Viability
Visual impact	Picture to cover scaffolding of what the new facade will look like	Architects, Designers, Engineers, Citizens	Design & Specification Construction & Installation
	design/concept images, mock-ups/materials		Planning Design & Specification

### 3.3. Stakeholder Group C - Financial Contributors

The return on investment seems to be the biggest concern of the financial contributors while this can be moderated by minimising the performance gap between the design and built, guarantee the performance and a possible pay as you save model. These solutions should be applied from the initiation and viability stage of a project of this nature. Secondly, the capital cost and the quality of the product is a concern which can be assured by:

- Quality/standards testing
- On-site inspections and testing
- Option for a partial retrofit

These solutions should be applied during the design, manufacturing, installation and operation stages.

Financing and security of investment is a problem that could be put on the table by the potential financial contributors of a prefabricated renovation from the early stages, however, this could be solved by performance guarantee, Technology Readiness Level (TRL) for prototype, showing improvement over time and showing demo TRL readiness for deployment. Finally, a possible constraint is whether the value of the property will increase or not in the relation of the cost of the installation, however, the experts in the field highlighted that the improvements on the energy ratings will increase the property value. The table below summarises the output from this group:

*Table 3 Challenges in prefabrication renovation from the perspective of a financial contributor and the associated proposed solutions by the participants in the workshop*

Challenge	Suggestion/Solution	In which stage of the process map the suggestions fit in
Return on Investment	confidence over model of energy savings prediction	Initiation & Viability
	eligibility for grants/incentives to improve ROI	
	Performance guarantee	
	Pay as you save model	
Capital Cost and Quality of product	Quality/Standards testing	Design & Specification
	On-site inspections and testings	Manufacturing
	partial retrofit	Construction & Installation Operation & Maintenance
Financing	PAYS model/EPC	Initiation & Viability Planning
Security of Investment	Performance guarantee	Initiation & Viability Planning
	TRL for prototype	
	Show improvement over time	
	Show demo TRL for deployment (maturation of product and demo of testing methods)	
Value of the property	Improvement of energy ratings	Design & Specification Manufacturing Construction & Installation Operation & Maintenance

### 3.4. Stakeholder Group D - Contractors (Builders/Developers)

The first task for Team D in the workshop was to recognise the top five problems and challenges faced by a contractor during a prefabrication renovation, while Team A identified the solutions. The main concern spotted was the construction/installation time which can be minimised by offsite preassembly, a dedicated supply team,

effective process/project management and enabling works. Also the disruption of the existing services of the building could be a problem where pre-installation site-surveys could moderate it. Furthermore, Team D also highlighted that the connectivity with the existing elements of the buildings could be a constraint for contractors, but standardisation and modularisation could tackle it. Finally, structural integrity and uncertainty seems like a major concern and considerable effort should be given in weight reduction of the panels during the manufacturing stage. The table below summarises the output from this group:

*Table 4 Challenges in prefabrication renovation from the perspective of a contractor (builder/developer) and the associated proposed solutions by the participants in the workshop*

<b>Challenges</b>	<b>Suggestion/Solution</b>	<b>In which stage of the process map the suggestions fit in</b>
Speed of installation	off-site preassembly	Design & Specification Construction & Installation
	dedicated supplier team	
	project/process management	
	enabling works	
disruption of existing services	pre-installation site survey	Initiation & Viability Planning Design & Specification
Connectivity for existing elements	Standardisation	Design & Specification Manufacturing
	Modularisation	
Appointment of specialists		Design & Specification Construction & Installation Operation & Maintenance End-of-life/Decommissioning
Structural integrity/uncertainty	Weight reduction	Design & Specification Manufacturing Construction & Installation

## 5 Conclusion

In summary, the first dissemination workshop held in November 2015 successfully demonstrated the project and its objectives to relevant external stakeholders, and also utilised their expertise to gain valuable insight into the barriers and challenges faced in retrofitting buildings with innovative prefabricated panels, from different points of view. The workshop also asked the stakeholders to come up with potential solutions to these issues and to suggest where they may fit into a new methodology and who else may be affected by these changes.

The main outputs from this workshop fed into Deliverable 4.1 'Stakeholder analysis and baseline methodologies, and will also feed into the following deliverable 4.2 which aims to produce a new Iterative Design Methodology for the Prefabrication Process taking into account the feedback received.

Overall, the experience and lessons learnt from this workshop will be used to plan for the following dissemination workshop towards the end of 2016.

## Annex 1 – Organisations who Attended the Workshop

<b>Company</b>
AECOM
PM Group
University College Dublin
Trinity College Dublin
Skanska UK
Accenture
Callaghan Engineering
Metec Consulting Engineers
Queen's University Belfast
Electricity Research Centre
Waterford Institute of Technology
Dublin Institute of Technology
Waterford Institute of Technology
United Technologies Research Center - Ireland
Energy Resource Solutions
IES Ltd.
National University of Ireland Galway
Arup
Jamcal
BDP
Geraghty Energy Consultants