



SUustainable solutions for affordable RETroFIT of domestic buildings

Call: H2020-LC-SC3-2018-2019-2020

Topic: LC-SC3-EE-1-2018-2019-2020

Type of action: IA

Grant Agreement number	894511
Project acronym	SUREFIT
Project full title	SUustainable solutions for affordable RETroFIT of domestic buildings
Due date of deliverable	31/08/2021
Lead beneficiary	AMS
Other authors	All partners contributed in the content of this deliverable

WP9 - Deliverable D 9.4 Exploitation plan

1.1.1 Dissemination Level

PU	Public	x
CO	Confidential, only for members of the consortium (including the Commission Services)	
CI	Classified, as referred to in Commission Decision 2001/844/EC	

1.1.2 Document History

Version	Date	Authors	Description
1	2/08/2021	Maria Pappa - AMS	Creation of the document
2	29/09/2021	Maria Pappa - AMS	First draft for the Coordinator
3	1/10/2021	Ricardo Barbosa - ISQ	Received comments by the Coordinator
4	4/10/2021	Maria Pappa - AMS	Draft for the partners
5	25/10/2021	Maria Pappa - AMS	Final version for Coordinator

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No **894511**



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Abbreviations

IPR	Intellectual Property Right
IP	Intellectual Property
TRL	Technology Readiness Level
AGA	Annotated Model Grant Agreement
EU	European Union
ER	Exploitable result
KER	Key Exploitable Result
GA	Grant Agreement
SME	Small Medium Enterprise
PV	Photovoltaic
PV-VG	Photovoltaic-Vacuum glazing window
CO ₂	Carbon Dioxide
PCM	Phase Change Material
WHR	Window Heat Recovery Systems
PEC	Psychometric Energy Core
DEG	Dissemination & Exploitation Group
R&D+i	Research, Development and Innovation
PV/T	Hybrid PV-Thermal
HVAC	Heating Cooling Air-Condition
ORDP	Open Research Data Pilot
DHW	Domestic Hot Water
DX-SAHP	Direct Expansion Solar Assisted Heat Pump
TP-GSHP	Ground Source Heat Pump using Thermal Pipes

Publishable summary

The SUREFIT project aims to demonstrate fast-track renovation of existing domestic buildings by integrating innovative, cost-effective, and environmentally conscious prefabricated technologies. This will be achieved through a systematic approach involving key stakeholders (building owners/users, manufacturers, product/services developers) in space heating, cooling, domestic hot water, lighting and power generation.

In the course of project's implementation, a number of results are expected to be generated. These results will be tangible or intangible outcomes of the project, such as data, knowledge and information in any form. Based on the Article 28 of the Grant Agreement, the beneficiaries must take measures in order to ensure exploitation of their results — either by themselves (e.g. for further research or for commercial or industrial exploitation in its own activities) or by others (other beneficiaries or third parties).

For this reason, an exploitation plan should be realized, that will be customized to the specific project's elements: partners, concept, targets, ambition, outcomes etc. The present deliverable report under the name "Exploitation Plan" should be submitted at an early stage of the project implementation, i.e. in M12. This deliverable presents all the parameters of an exploitation plan, i.e. the expected exploitable results (ER) as they are identified by the responsible partners at this early stage of the project, the ownership of each ER, the exploitation routes, the partner's expectations and claims, the intellectual property right issues, the technology readiness level, a risk assessment and finally, a first approach of the exploitation plan for the results. This deliverable report should be updated at a later stage of the project (M40) when the exploitable results and all the exploitation parameters would be set in stone, and this will be the final exploitation plan of the SUREFIT project.

Introduction

The SUREFIT project aims to demonstrate fast-track renovation of existing domestic buildings by integrating innovative, cost-effective, and environmentally conscious prefabricated technologies. This will be achieved through a systematic approach involving key stakeholders (building owners/users, manufacturers, product/services developers) in space heating, cooling, domestic hot water, lighting and power generation. There are, therefore, various results arising from the work performed in the project and proper exploitation of these results should be ensured.

In the paragraph 2.2.2 *Exploitation of the project result* of the Grant Agreement of SUREFIT project it is mentioned that the dissemination and exploitation activities will include data management, publication identification, IP related issues, license agreement, business ventures, technology implementation plan. The data management plan and the publication identification is reported in the *D9.2 – Dissemination Plan and Data Management Plan*, therefore in the present deliverable will be reported issues related to the exploitable results of the SUREFIT and the definition of the appropriate actions that are needed in order to achieve a successful exploitation that will cover both market and academic purposes.

The exploitation plan that is reported in the present deliverable is structured as follows:

- i) firstly, the exploitable results and the main owners of these results are identified
- ii) the possible exploitation routes for each one of the exploitable results are presented
- iii) a preliminary characterization of the results is performed
- iv) the exploitation expectations and claims of the partners are identified
- v) a BFMULO analysis is made
- vi) the IPR management is presented
- vii) the Technology Readiness Level (TRL) is identified
- viii) an initial risk assessment is performed.

According to the Grant Agreement of the SUREFIT project, the Exploitation Plan has to be delivered at the end of the first year of the project (M12) and there is not any additional Exploitation Plan to be performed throughout the rest three years of the project. However, since M12 is considered as an early stage of the project implementation and at this stage, no implementation has started regarding the proposed technologies; it is considered as necessary to perform another Exploitation Plan at a more mature stage of the project regarding the technological evolution. Therefore, the present Exploitation Plan is considered as an initial exploitation plan and an updated Exploitation Plan report will be performed in M40.

3 European framework for the exploitable results

The Article 28 of the Annotated Model Grant Agreement (AGA) sets the framework for the exploitable results of an EU funded project as well as the obligation of the beneficiary towards the exploitation. Based on the Article 28, the beneficiaries must take measures aiming to ensure exploitation of their results — either by themselves (e.g. for further research or for commercial or industrial exploitation in its own activities) or by others (other beneficiaries or third parties, e.g. through licensing or by transferring the ownership of results). This is a best effort obligation: the beneficiaries must be proactive and take specific measures to ensure that their results are used (to the extent possible and justified).

Furthermore, the Article 28 specifically mentions the obligation of each beneficiary to exploit its result, the contribution of the results to standardization and the consequences of non-compliance with the Article 28. These terms are presented in the following paragraphs.

3.1 Article 28 Paragraph 1 of the AGA: Obligation to exploit the results

Each beneficiary must — up to four years after the end of the project — take measures aiming to ensure ‘exploitation’ of its results (either directly or indirectly), in particular through transfer or licensing; by:

- (a) using them in further research activities (outside the action);
- (b) developing, creating or marketing a product or process;
- (c) creating and providing a service, or
- (d) using them in standardisation activities.

3.2 Article 28 Paragraph 2 of the AGA: Results that could contribute to European or international standards

If results are incorporated in a standard, the beneficiary concerned must — unless the Commission/Agency requests or agrees otherwise or unless it is impossible — ask the standardisation body to include the following statement in the standard: "Results incorporated in this standard received funding from the European Union’s Horizon 2020 research and innovation programme”.

3.3 Article 28 Paragraph 3 of the AGA: Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (in accordance with Article 43). The obligation applies only to beneficiaries receiving EU funding. Where possible, the measures should be consistent with the impact expected from the action and the plan for the exploitation and dissemination of the results. If the GA provides for additional exploitation obligations, these must also be fulfilled. If the GA includes the option for information on standardisation, the beneficiaries must moreover inform the Commission/Agency on any results that could contribute to European or international standards.

4 Exploitable Results of SUREFIT

SUREFIT involves a variety of key stakeholders such as building owners/users, manufacturers, product/services developers in space heating, cooling, domestic hot water, lighting and power generation. The key stakeholders of the SUREFIT Project are:

- Instituto de Soldadura e Qualidade (ISQ) – Institute
- Advanced Management Solutions Ltd (AMS) – SME
- University of Nottingham (UNOTT) – University
- SOLIMPEKS Solar Energy Corp. (SOLIMPEKS) – SME
- Winco Technologies (WINCO) – SME
- PCM Products Limited (PCM) – SME
- KÖSTER Lichtplanung Ltd (KOST) – SME
- Fundación Santa María la Real (FMS) – Foundation
- Aalto University (AALTO) – University
- Cândido José Rodrigues, SA (CJR) – SME
- Oncontrol Technologies, LDA (ONCONTROL) – SME

SUREFIT also involves a variety of technologies that include bio-aerogel panels integrated with phase change materials, photovoltaic (PV) vacuum glazing windows, roof and window heat recovery devices, solar assisted heat pumps/ground source heat pumps, evaporative coolers, integrated solar thermal/PV systems and lighting devices. These will be prefabricated for rapid retrofit with minimal disruption to occupants, ensuring high levels of occupant comfort/indoor environmental quality as well as low risk of moisture-related problems/summer overheating. The work programme will involve optimal sizing and prefabrication of technologies tailored to building design/ requirements; retrofitting/monitoring buildings in different climates with support of advanced building energy management systems; analysing indoor environment quality, energy use, user behaviour/acceptance of the solutions; developing methodology, guidelines/effective operational tools for rapid retrofitting and decision-making; and developing business model involving all relevant actors including, public authorities/investors/users and holistic integration of disciplines across the value chain.

4.1 Initial identification of the possible KER

In order to develop an appropriate and comprehensive Exploitation Plan, the Key Exploitable Results (KER) of the SUREFIT project must be identified. All partners of the SUREFIT project were asked to update, add or erase the KER that have been identified at the proposal state and mentioned in the Grant Agreement, and the outcome of this task is presented in Table 1.

No	Key Exploitable result	Description	Main owner	Contributing partners	Other Interested partner
1	Optimum design, operation and control of renovation technologies	Use of commercial software to achieve optimum design, operation and control of technologies	UNOTT	AALTO : will study the optimal sizing of the technologies, energy consumption and indoor conditions	-
2	Renovation concepts	Parametric optimization to find the most cost effective energy renovation measures.	AALTO	ISQ : development of models for the technologies, cost analysis for the optimization. UNOTT : energy performance of the technologies, UK retrofit standards, indoor thermal & lighting comfort evaluation.	-
3	Next generation bio-aerogel panel	Alternative aerogel insulation panels, including bio-aerogel, silica-aerogel and other	UNOTT	WINCO : measurements of conductivity of bio aerogel panels combined or laminated with breathable membranes, reflective and breathable membranes and aluminum foils.	-
4	PCM panels	The PCM will be encapsulated in a watertight container, utilizes waste heat/cooling in order to store thermal energy for later use which can be used passively or actively.	PCM	UNOTT : will simulate the indoor comfort and provide suggestions on the selection of the PCM melting points.	-
5	PV vacuum glazing windows (PV-VG)	A unique solution to conventional glazing. It is a power generator and a thermal insulator and can convert up to 10% of the solar irradiation into electricity and reduce air conditioning energy consumption by up to 75%. Meanwhile, it can provide a much lower U-value for windows (1 W/m ² K or lower).	UNOTT	SOLIMPEKS : contribution in manufacturing, if needed AALTO : study the energy and CO2 emission savings potential.	-
6	Solar thermal and PV systems	Integrated solar thermal and photovoltaic system	SOLIMPEKS	AALTO : study the energy saving potential of Solar thermal & PV vacuum glazing windows. UNOTT : assist in the integration of PV/T system with other space heating and DHW system.	-
7	Window heat recovery devices	Small heat recovery and air filtering units can be installed on window frame. The system uses heat normally lost from the room to bring in and preheat fresh air and save energy.	UNOTT	ISQ : development of models and simulations to design and size the technology.	-

8	Evaporative coolers	This novel dew point core takes the same structure of the evaporative cooling pad structure. It has both advantages of the evaporative cooling pad, and dew point cooling, but without the drawbacks described above. Two core techniques are included in the novel cores, namely special corrugated plates for dew point cooling, and special sealing technology for the sealing. The core could be easily to be enlarged to treat large airflow without increase in pressure drop.	UNOTT	ISQ: development of models and simulations to design and size the technology.	-
9	Membrane wrapping	-100% non-combustible roofing and rain screen reflective membranes with swelling clay as raw materials -Black Rainscreen membrane with A1 classification for facades. -Hygro-variable vapor barrier non-combustible membranes for Indoor application	WINCO	-	-
10	Innovative multi-purpose heat pumps	A solar-assisted heat pump combines solar air collector with heat pump technology. Such a heat pump including direct expansion type and will be used for retrofit in domestic buildings to provide heating and/or cooling and hot water for buildings. Also, it can be driven into the ground using a hand held piler and act as a heat source/sink for a heat pump. In comparison to conventional ground coil heat exchangers. The TP provides significant advantages, notably low cost, and easy installation, especially in locations inaccessible to drilling machines. The TP can either be a solid rod or a "hybrid" tube containing a liquid such as propylene glycol/water. Heat transfer from the TP to the heat pump is achieved via a glycol circuit that includes a heat exchanger on the top of the TP.	UNOTT	ISQ: development of models and simulations to design and size the technology. PCM: experience in the HVAC industry and also in secondary refrigerants	-

11	User friendly computer program for planning and retrofitting of residential buildings	User-friendly computer program for supporting the selection of optimal retrofitting and technologies for different scenarios, with the aim of enabling optimization of the renovation process and decision-making.	ISQ	-	-
12	Methodology and guidelines for retrofitting	A method of generating a planning of building retrofit for a portfolio of buildings.	ISQ	AALTO: define by simulations optimal renovation packages. UNOTT: suggest the retrofit installation methods and to avoid the overheating issues, grid stability and operational guidance.	WINCO
13	Integration of daylight and electric lighting	Daylight systems with internal/external louvers.	KOESTER	-	-

Table 1 Initial identification of the possible KER

4.2 Exploitation routes for results

The results generated by the project can be used in developing, creating and marketing a product or process, or in creating and providing a service or in further research activities that can be other than those covered by the project.

The exploitation route options can be divided into several categories, such as:

- Use for further research activities
- Developing and selling own products/services
- Spin-Off activities
- Cooperation agreement/Joint Ventures
- Selling IP rights
- Licensing IP rights (out-licensing)
- Standardization activities (new standards/ongoing procedures)

The following Table (Table 2) summarizes the possible exploitation routes for the initial key exploitable results of the SUREFIT.

No.	Key Exploitable result	Main owner	Possible exploitation routes
KER 1	Optimum design, operation and control of renovation technologies	UNOTT	Use for further research activities, Spin-Off activities, Licensing IP rights, Selling IP rights
KER 2	Renovation concepts	AALTO	Use for further research activities

KER 3	Next generation bio-aerogel panel	UNOTT	Cooperation agreement/Joint Ventures, Use for further research activities, Spin-Off activities, Licensing IP rights, Selling IP rights
KER 4	PCM panels	PCM	Cooperation agreement/Joint Ventures, Selling own products/services
KER 5	PV vacuum glazing windows (PV-VG)	UNOTT	Cooperation agreement/Joint Ventures, Use for further research activities, Spin-Off activities, Licensing IP rights, Selling IP rights
KER 6	Solar thermal and PV systems	SOLIMPEKS	Cooperation agreement/Joint Ventures, Selling own products/services
KER 7	Window heat recovery devices	UNOTT	Cooperation agreement/Joint Ventures, Use for further research activities, Spin-Off activities, Licensing IP rights, Selling IP rights
KER 8	Evaporative coolers	UNOTT	Cooperation agreement/Joint Ventures, Use for further research activities, Spin-Off activities, Licensing IP rights, Selling IP rights
KER 9	Membrane wrapping	WINCO	Selling own products/services
KER 10	Innovative multi-purpose heat pumps	UNOTT	Cooperation agreement/Joint Ventures, Use for further research activities, Spin-Off activities, Licensing IP rights, Selling IP rights
KER 11	User friendly computer program for planning and retrofitting of residential buildings	ISQ	Cooperation agreement/Joint Ventures, Use for further research activities, Licensing IP rights, Selling IP rights
KER 12	Methodology and guidelines for retrofitting	ISQ	Use for further research activities, Licensing IP rights, Selling IP rights
KER 13	Integration of daylight and electric lighting	KOESTER	Selling own products/services

Table 2 Exploitation routes for the Exploitable results of the SUREFIT

4.3 Preliminary characterization of exploitable results

In order for a preliminary characterization of an exploitable result to take place, a number of parameters need to be identified for this result. These parameters are the following:

- The innovation of the result
- The time that this result is expected to be achieved
- The potential customers
- The benefits for the potential customers
- The costs to be incurred (after the end of the project)
- The expected time to market
- The price of the product/service etc.

- The competitors
- Any means of protection of the result
- Possible barriers for the implementation of the exploitation

These parameters have been considered from the partners involved in each of the exploitable results of the SUREFIT and are presented in Table 3 to Table 17.

4.3.1 Exploitable Result #1

Exploitable Result #1	Optimum design, operation and control of renovation technologies
Innovative concept of result	Ambient and indoor comfort-controlled space heating and hot water supply.
Expected date of achievement in the project	31 th August, 2021
Customers	Dwelling occupants
Benefits for the customer	Occupants can save energy bills, and improve the indoor air quality.
Costs to be incurred after the project	Not known yet
Expected time to market	Not known yet
Price range	1000-2000€
Competitors	No
Will you protect this result? How? When?	Copyright, at the end of 2024
Possible barriers for implementation	Possible mismatch with occupancy schedule due to sensor sensitivity and response delay.

Table 3 Preliminary characterization of the exploitable result #1

4.3.2 Exploitable Result #2

Exploitable Results #2	Renovation concepts
Innovative concept of result	Cost effective renovation concepts to reach 60% energy and CO ₂ emission reductions.
Expected date of achievement in the project	At the end of WP2
Customers	All the stakeholders

Benefits for the customer	Energy and CO ₂ emission saving potential by renovation concepts.
Costs to be incurred after the project	No
Expected time to market	At the end of WP2
Price range	Renovation concepts will be publicly available for free.
Competitors	Concepts are not sold by Aalto or any other partners.
Will you protect this result? How? When?	No. The concepts will be published in open access publications.
Possible barriers for implementation	No, results will be publicly available.

Table 4 Preliminary characterization of the exploitable result #2

4.3.3 Exploitable Result #3

Exploitable Results #3	Next generation bio-aerogel panel
Innovative concept of result	Next generation alternative and environmentally friendly bio-aerogel based thermal insulation panel with lower U-value.
Expected date of achievement in the project	June 31 th 2021
Customers	Individuals, constructors, engineers
Benefits for the customer	Do not change the building outlook, energy bills saving and improvement of indoor comfort.
Costs to be incurred after the project	130-150 €/m ²
Expected time to market	January 2022
Price range	150-230 €/m ²
Competitors	Aerogel composite blanket, Silicon-aerogel insulation panels, Vacuum insulation panels, PIR insulation panels
Will you protect this result? How? When?	Licensing, at the end of 2024
Possible barriers for implementation	High unit cost, condensation issues of the material surface

Table 5 Preliminary characterization of the exploitable result #3

4.3.4 Exploitable Result #4

Exploitable Results #4	PCM panels
Innovative concept of result	PCM panel for building integration
Expected date of achievement in the project	Month 15
Customers	Aimed at residential sector for new build and retrofit passive cooling and heating.
Benefits for the customer	Reduced energy bills by utilising PCM to shift the load from peak times and provide passive cooling/heating.
Costs to be incurred after the project	TBC
Expected time to market	2-3 Months post project completion
Price range	45-60 €/m ²
Competitors	Armstrong (USA), Datum Ceiling (UK), BASF (Germany), Knauf (Germany), Winco (France), BioPCM (USA)
Will you protect this result? How? When?	Trademark, Patent.
Possible barriers for implementation	N/A

Table 6 Preliminary characterization of the exploitable result #4

4.3.5 Exploitable Result #5

Exploitable Results #5	PV vacuum glazing windows (PV-VG)
Innovative concept of result	PV vacuum glazing windows with U-value lower than 0.65 W/m ² , and electricity generation efficiency of 3.5%
Expected date of achievement in the project	May 2021
Customers	Individuals, constructors, engineers
Benefits for the customer	Energy bills saving and improvement of indoor thermal comfort
Costs to be incurred after the project	700-850 €/m ²
Expected time to market	After 2022
Price range	1000-1200 €/m ²

Competitors	N/A
Will you protect this result? How? When?	Patent & Licensing, at the end of 2024
Possible barriers for implementation	High cost investment, Daylighting reduce

Table 7 Preliminary characterization of the exploitable result #5

4.3.6 Exploitable Result #6

Exploitable Results #6	Solar thermal and PV systems
Innovative concept of result	SOLIMPEKS will also produce novel solar thermal and PV systems for integration into buildings. Advanced evacuated tube solar collectors will be investigated where the absorber is treated with a selective Tinox coating to maximise the solar energy absorbed and minimise heat loss through radiation. Novel (poly exchanger for) solar collectors which could form a component of roofing and facade structure will also be produced by this partner together with UNOTT for heating hot water and as a heat source for heat recovery or solar powered cooling.
Expected date of achievement in the project	M18
Customers	Home owners, building contractors, hotels
Benefits for the customer	Having highly efficient hybrid panels producing both electricity and thermal energy. This also allow users couple PV/Ts with heat pumps and evaporative coolers.
Costs to be incurred after the project	Product cost: €350/pvt, accessory cost: €300/pvt (inverter, cable, assembly tool set, piping, boiler, circulation pump etc.), installation fees: €70/hour (including installation time and labour cost, excluding travel expense), maintenance cost: €70/hour (excluding travel expense)
Expected time to market	5 years
Price range	€350/PVT
Competitors	DUALSUN
Will you protect this result? How? When?	Patent protection, when the product's performance is proven.
Possible barriers for implementation	Technical barriers, conflict, diverging interests

Table 8 Preliminary characterization of the exploitable result #6

4.3.7 Exploitable Result #7

Exploitable Results #7	Window heat recovery devices
Innovative concept of result	Heat pipe-based window heat recovery
Expected date of achievement in the project	1 st August 2021
Customers	Dwelling occupants
Benefits for the customer	Energy bills saving and improvement of indoor thermal comfort and air quality
Costs to be incurred after the project	250-350 €/m ²
Expected time to market	After the technology is developed
Price range	300-500 €/m ²
Competitors	Central controlled mechanical ventilation with heat recovery
Will you protect this result? How? When?	Patent & Licensing at the end of 2024
Possible barriers for implementation	Heat pipe energy efficiency may be reduced in extreme low ambient temperature

Table 9 Preliminary characterization of the exploitable result #7

4.3.8 Exploitable Result #8

Exploitable Results #8	Evaporative coolers
Innovative concept of result	Desiccant cooler and evaporative cooler with efficient temperature and humidity control.
Expected date of achievement in the project	End of August 2021
Customers	Dwelling occupants
Benefits for the customer	Cooling and dehumidification in summer.
Costs to be incurred after the project	500-600 €/m ²
Expected time to market	December of 2023
Price range	700-900 €/m ²
Competitors	Air conditioner

Will you protect this result? How? When?	Patent & Licensing at the end of 2024.
Possible barriers for implementation	It is installed in one room not the whole house, central control

Table 10 Preliminary characterization of the exploitable result #8

4.3.9 Exploitable Result #9

Exploitable Results #9	Membrane wrapping
Innovative concept of result	Non combustible thin waterproof breathable membrane does not exist in the market.
Expected date of achievement in the project	August 2023 (M36)
Customers	Any contractor involved in façade and/or roof membranes installation-Any specifier for thermal renovation of building.
Benefits for the customer	Fire protection and better insulation in case of heatwave.
Costs to be incurred after the project	N/A
Expected time to market	12 months
Price range	About 3 to 5 euro/m ²
Competitors	Dorken but B euroclass instead of A (fire reaction)
Will you protect this result? How? When?	Patent
Possible barriers for implementation	Price

Table 11 Preliminary characterization of the exploitable result #9

4.3.10 Exploitable Result #10

Exploitable Results #10	Innovative multi-purpose heat pumps
Innovative concept of result	High efficient solar assisted heat pump
Expected date of achievement in the project	31 th August, 2021
Customers	Dwelling occupants

Benefits for the customer	Occupants can save energy bills
Costs to be incurred after the project	Not known yet
Expected time to market	September 2021
Price range	3260-6540€ depending on the heating capacity and hot water tank sizes, tax is not included
Competitors	Ground source heat pump, air source heat pump, water source heat pump
Will you protect this result? How? When?	Patent & Licensing at the end of 2024
Possible barriers for implementation	The solar assisted heat pump cannot provide space cooling

Table 12 Preliminary characterization of the exploitable result #10

4.3.11 Exploitable Result #11

Exploitable Results #11	User friendly computer program for planning and retrofitting of residential buildings
Innovative concept of result	User-friendly computer program to support the selection of optimal retrofitting strategies in a given building, easing the selection of different technologies for different scenarios
Expected date of achievement in the project	By the end of the project
Customers	Building/house owners, operators, buildings stakeholders (architects, constructors, etc.)
Benefits for the customer	The operational tool to be an open-source application that will help stakeholders to decide different possibilities for building retrofitting and renovation. Given the conditions of a building, the program will display available technologies for a specific function (e.g. façade), or a combination of them, and show how each technology could be installed quickly together with costs involved and potential energy saved.
Costs to be incurred after the project	N/A
Expected time to market	A year after the end of the project
Price range	N/A
Competitors	N/A

Will you protect this result? How? When?	Although this is a tool that has to be submitted as a public deliverable within the project, after the action the tool can be susceptible of improvements and adaptations to be sold as a service.
Possible barriers for implementation	Lack of interest of potential clients.

Table 13 Preliminary characterization of the exploitable result #11

4.3.12 Exploitable Result #12

Exploitable Results #12	Methodology and guidelines for retrofitting
Innovative concept of result	Brief handbook to give to every end user of the operational tool (home owner, contractor, etc.) the essential knowledge, the requirements, method and best practices for a guided implementation and decision making and needed for renovation and retrofitting.
Expected date of achievement in the project	M48
Customers	Building/house owners, contractors, operators, buildings stakeholders (architects, constructors, etc.)
Benefits for the customer	Innovative guidelines and best practice will be described for retrofitting of residential buildings
Costs to be incurred after the project	0
Expected time to market	-
Price range	-
Competitors	-
Will you protect this result? How? When?	ORDP: Open Research Data Pilot (not sure if possible to be protected)
Possible barriers for implementation	-

Table 14 Preliminary characterization of the exploitable result #12

4.3.13 Exploitable Result #13

Exploitable Results #13	Integration of daylight and electric lighting
Innovative concept of result	Integration of daylight and electric lighting by harmonizing the light color and integrating the luminous fluxes
Expected date of achievement in the project	End of the project
Customers	individuals
Benefits for the customer	Reduced energy cost for electric lighting
Costs to be incurred after the project	Less energy cost for the consumer
Expected time to market	anytime
Price range	N/A
Competitors	non
Will you protect this result? How? When?	N/A
Possible barriers for implementation	non

Table 15 Preliminary characterization of the exploitable result #13

5 Partners' exploitation expectations and claims

In this chapter is presented an initial analysis of the exploitation expectations and claims of the partners that are involved in each one of the exploitable results. For this analysis, the BFMULO matrix was implemented.

The following explains what each letter of the BFMULO matrix means:

B: Intellectual property rights on background information. The background information includes any data, know-how or information – whatever its form or nature (tangible or intangible), including any rights such as intellectual property rights – that: (a) is held by the beneficiaries before they acceded to the Agreement, and (b) is needed to implement the action or exploit the results.

F: Intellectual property rights on foreground information. The foreground information includes any (tangible or intangible) output of the action such as data, knowledge or information – whatever its form or nature, whether it can be protected or not – that will be generated in the action, as well as any rights attached to it, including intellectual property rights.

M: Making/producing the product(s)/result(s), manufacturing and selling or implementing it through own facilities and skills.

U: Using the result, implemented with own knowledge to develop new ranges of products or newer processing. Furthermore, the direct or indirect utilization of foreground in further research activities other than those covered by the project, or for developing, creating and marketing a product or process, or for creating and providing a service.

L: Licensing the result(s) to 3rd parties

O: Other, any other exploitation means e.g. provide consultancy or other services, etc.

The preliminary exploitation intention of the partners of SUREFIT are listed in Table 18 and Table 19.

	ER 1	ER 2	ER 3	ER 4	ER 5	ER 6	ER 7
ISQ		FUO					FUO
AMS							
UNOTT	BU		BFUL		BUL		FULO
SOLIMPEKS						BMUO	
WINCO			FMU				
PCM				BFMULO			
KOST							
FSM		FUO					
AALTO		BFU					
CJR							
ONCONTROL							

Table 16 The preliminary exploitation intentions (ER1 – ER7)



	ER 8	ER 9	ER 10	ER 11	ER 12	ER 13
ISQ	FUO		FUO	FMULO	BFO	
AMS						
UNOTT	BULO		BUL			
SOLIMPEKS						
WINCO		BMU				
PCM						
KOST						BMU
FSM					FUO	
AALTO						
CJR						
ONCONTROL						

Table 17 The preliminary exploitation intentions (ER8 – ER13)

As it can be seen from the above Table, i) there aren't any exploitation claims M or U or L or O that are not covered by the claims B or F, ii) the partners claiming B or F are also exploiting (M or U or L or O) the results and iii) every exploitable result has exploitation intention.

6 IPR management

In practice, any development (knowledge, know-how, material, product, method etc.) that took place prior or during an EU project and is relevant to it can be considered as intellectual property (IP) and actions should be taken in order the Intellectual Property Rights (IPR) to be clearly defined and protected. In the following paragraphs are analyzed the means of IPR protection, the initial intentions of IPR protection of SUREFIT results and the IPR management.

6.1 Means of IPR protection

The means of protection of the IPRs include:

- Patent
- Utility model
- Industrial design
- Trademark
- Trade secret
- Licensing
- Copyright
- Other

Patent: Patents are a key tool to encourage investment in innovation and encourage its dissemination. A patent is a legal title that can be granted for any invention having a technical character provided that it is new, involves an 'inventive step', and is susceptible to industrial application. A patent can cover how things work, what they do, what they are made of and how they are made. Anybody can apply for a patent. It gives the owner the right to prevent others from making, using or selling the invention without permission. Patents encourage companies to make the necessary investment for innovation, and provide the incentive for individuals and companies to devote resources to research and development. Patents also imply the disclosure of the protected invention. This fosters the dissemination of innovation. Currently, (technical) inventions can be protected in Europe either by **national patents**, granted by the competent national IP authorities in EU countries or by **European patents** granted centrally by the European Patent Office¹.

Utility Model: A utility model is a registered right that gives the holder exclusive use of a technical invention. The right is given in exchange for public disclosure of the workings of the invention and is granted for a limited period. Utility models provide fast and low-cost protection for technical inventions since they are usually granted without substantive examination. For this reason, they are more accessible to individual innovators or small and medium-sized enterprises (SMEs) than patents, to which they are similar in their principle. In some countries, utility models may be referred to as 'petty patents' or 'innovation patents'. In countries where utility model protection is available, it is generally intended for the protection of minor or incremental innovations, frequently for mechanical or electrical devices². An owner of a utility model obtains



the exclusive right for a limited period, usually between six to 15 years from the filing date, depending on the country.

Industrial design: The design of a product is often the main reason that consumers chose it over others. Industrial design rights protect the appearance of a product, which results from attributes such as its shape, colours or materials. The EU has harmonised industrial design protection across EU countries and introduced the Community design that offers unitary protection across the EU through a single procedure³.

Trademark: Trademark registration is one of the most effective ways to build and defend a brand. In Europe, trademarks can be registered at national level as a national trade mark or at EU-level as a European Union trade mark. A trade mark is a sign which distinguishes the goods and services of one company from those of another. As indicators of business origin, trade marks can be words, logos, devices or other distinctive features, or a combination of these. They can also be referred to as 'brands'. A trade mark can become one of a company's most important assets. It is the mark through which a business can attract and retain customer loyalty, and create value and growth⁴.

Trade secret: A trade secret is a valuable piece of information for an enterprise that is treated as confidential and that gives that enterprise a competitive advantage. Companies constantly develop information which can help them to perform better, faster or at lower cost. Such knowledge can include new manufacturing processes, improved recipes, or information on whom to buy from and whom to sell to. Information protected through a trade secret can be strategic for decades (for example, a recipe or a chemical compound), or ephemeral (for example, the results of a marketing study, the name, price and launch date of a new product, or the price offered in a bidding procedure). Information, knowledge, inventiveness and creativity are the raw materials of the new economy, and trade secrets are important for companies both large or small, in all economic sectors. However, while large companies have the resources to manage a large portfolio of intellectual property rights, such as patents, smaller companies often cannot afford to do this - therefore their reliance on trade secrets is greater⁵.

Licensing: A holder of an intellectual property (licensor) can negotiate a licensing agreement with another entity (licensee) that gives permission for it to use the intellectual property. There can be a single licensee ('exclusive license') or several licensees. If offering multiple licenses, these can be open or limited in scope to particular industries or geographical areas (such as franchising). In exchange, the licensor is paid for giving permission, typically in the form of "royalties" defined as a percentage of the sales⁶.

Copyright: Copyright is a type of intellectual property that gives its owner the exclusive right to make copies of a creative work, usually for a limited time. The creative work may be in a literary, artistic, educational, or musical form. Copyright is intended to protect the original expression of an idea in the form of a creative work, but not the idea itself⁷.

6.2 IPR protection procedures

As the project will be operated in a form of collaboration between the companies and the universities/research/public organisations, any intellectual property rights arising from the work will be a joint issue of these organisations. In this case, the consortium partners will organise a meeting at a proper time to negotiate an appropriate revenue sharing arrangement, which will be based on the contributions of each partner to the project. This most probably will form an agreement to be signed at an appropriate stage of the project between the consortium partners. It should be stressed that such agreements should only be signed after generating the results (e.g. patent cases) and identifying the contribution each partner made to the results.

When the project intends to use the existing intellectual properties within the consortium or outside, a legal request process will be conducted to ensure the logistic use of the materials and fees to be paid as need. In case of confliction, the legal departments of the partner organisations will be involved to help resolve the matter. If required, a Confidentiality Agreement will be signed and/or a more comprehensive Cooperation Agreement will be put in place in order to protect the background Intellectual Property of each Partner and define the mechanisms of sharing the foreground IP generated in the course of the project. It is envisaged that such an agreement will be discussed and signed by all partners during the kick-off meeting of the project.

6.3 Initial intention of IPR protection

Although this deliverable report is realized in an early stage of the project implementation, an attempt has been made by the partners in order to define the IPR protection of some results. The relevant information is summarized in Table 20.

No	Key Exploitable result	Main owner	Contributing partners	Other Interested partner	IPR protection
1	Optimum design, operation and control of renovation technologies	UNOTT	AALTO : will study the optimal sizing of the technologies, energy consumption and indoor conditions	-	Utility model
2	Renovation concepts	AALTO	ISQ : development of models for the technologies, cost analysis for the optimization. UNOTT : energy performance of the technologies, UK retrofit standards, indoor thermal & lighting comfort evaluation.	-	None
3	Next generation bio-aerogel panel	UNOTT	WINCO : measurements of conductivity of bio aerogel panels combined or laminated with breathable membranes, reflective and breathable membranes and aluminum foils.	WINCO	Patent
4	PCM panels	PCM	UNOTT : will simulate the indoor comfort and provide suggestions on the selection of the PCM melting points.	-	Patent. Trademark. Licensing.
5	PV vacuum glazing windows (PV-VG)	UNOTT	SOLIMPEKS : contribution in manufacturing, if needed AALTO : study the energy and CO2 emission savings potential.	-	Patent

6	Solar thermal and PV systems	SOLIMPEKS	AALTO : study the energy saving potential of Solar thermal & PV vacuum glazing windows. UNOTT : assist in the integration of PV/T system with other space heating and DHW system.	-	Patent. Utility model. Industrial design.
7	Window heat recovery devices	UNOTT	ISQ : development of models and simulations to design and size the technology.	-	Patent
8	Evaporative coolers	UNOTT	ISQ : development of models and simulations to design and size the technology.	-	Patent
9	Membrane wrapping	WINCO	-	-	Patent
10	Innovative multi-purpose heat pumps	UNOTT	ISQ : development of models and simulations to design and size the technology. PCM : experience in the HVAC industry and also in secondary refrigerants	-	Patent
11	User friendly computer program for planning and retrofitting of residential buildings	ISQ	-	-	Utility model. Copyright.
12	Methodology and guidelines for retrofitting	ISQ	AALTO : define by simulations optimal renovation packages. UNOTT : suggest the retrofit installation methods and to avoid the overheating issues, grid stability and operational guidance.	WINCO	None
13	Integration of daylight and electric lighting	KOESTER	-	-	Patent

Table 18 Initial intentions for IPR protection

6.4 IPR management

The IPR management should also include a first plan regarding the shares that each partner will claim for every result. At this stage of the project, some initial discussions have been performed among the interested parties and the agreed shares are presented in the following Table. As it can be seen, half of the results belong only to one partner and the rest belong to two partners. Based on that, the division of shares of each exploitable result is expected to be a rather straightforward process that will not create major conflicts. Only one result that is related to the renovation concepts is divided to 11 parts and this is due to the fact that the whole Consortium will contribute to this (Table 21).

No	Key Exploitable result	ISQ	AMS	UNOTT	SOLIMPEKS	WINCO	PCM	KOEST	FSM	AALTO	CJR	ONCONTROL
1	Optimum design, operation and control of renovation technologies			100								
2	Renovation concepts	14	5	20	8	8	8	8	8	5	8	8



3	Next generation bio-aerogel panel			100								
4	PCM panels			20			80					
5	PV vacuum glazing windows (PV-VG)			100								
6	Solar thermal and PV systems			20	80							
7	Window heat recovery devices	30		70								
8	Evaporative coolers	30		70								
9	Membrane wrapping					100						
10	Innovative multi-purpose heat pumps	30		70								
11	User friendly computer program for planning and retrofitting of residential buildings			100								
12	Methodology and guidelines for retrofitting	60		40								
13	Integration of daylight and electric lighting							100				

Table 19 Shares intention of the SUREFIT exploitable results

7 Technology Readiness Level - TRL

Technology Readiness Levels (TRL) are indicators of the maturity level of particular technologies. This measurement system provides a common understanding of technology status and addresses the entire innovation chain. There are nine technology readiness levels; TRL 1 being the lowest and TRL 9 the highest⁸ that are described in Table 22.

Technology Readiness Level (TRL)	
TRL 1	Basic principles observed
TRL 2	Technology concept formulated
TRL 3	Experimental proof of concept
TRL 4	Technology validated in lab
TRL 5	Technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
TRL 6	Technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
TRL 7	System prototype demonstration in operational environment
TRL 8	System complete and qualified
TRL 9	Actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

Table 20 Technology Readiness Level (TRL)

The proposed project will produce innovative technologies based on proven concepts and ideas, like aerogel and PCM panels, while simultaneously making use of some existing technologies such as insulating breather membrane wrapping. The technology readiness levels of the key technologies are indicated in Table 23 - the technologies start at TRL 6 or higher:

No.	Exploitable Result	From TRL	To TRL
KER 1	Optimum design, operation and control of renovation technologies	2	8-9
KER 2	Renovation concepts	6	8-9
KER 3	Next generation bio-aerogel panel	6	8-9
KER 4	PCM panels	7	8-9
KER 5	PV vacuum glazing windows (PV-VG)	6	8-9
KER 6	Solar thermal and PV systems	7	8-9
KER 7	Window heat recovery devices	6	8-9
KER 8	Evaporative coolers	6	8-9
KER 9	Membrane wrapping	7	8-9

KER 10	Innovative multi-purpose heat pumps	6	8-9
KER 11	User friendly computer program for planning and retrofitting of residential buildings	6	8
KER 12	Methodology and guidelines for retrofitting	6	8
KER 13	Integration of daylight and electric lighting	7	8-9

Table 21 Technology Readiness Level (TRL)

Extensive research and development work on bio-sources aerogel has been carried out under a major EU HERB project and Marie Curie Fellowship. The work has led to installation and testing of bio-source aerogel panels in different buildings in Europe. A small manufacturing plant has been developed for manufacturing this material^{9, 10}. Research on PV vacuum glazing has been carried out by the applicants over the past few years. The work is funded by Innovate UK. The research has led to the development and testing PV vacuum glazing windows in buildings in the UK and China^{11, 12}. Research and development work on the direct expansion solar assisted heat pump has been carried out by the proposed project partners (UNOTT and ISQ) over the past 6 years. These works include modelling work, laboratory testing and field trials^{13, 14, 15}. In addition, several pre-commercial solar assisted heat pump prototypes have been tested in UK houses in Wolverhampton, Cirencester, Oxford and Gloucester by the proposed project partners. Development work on Window Heat Recovery Systems (WHR) has been carried out by the proposed project partners, under Innovate UK in collaboration with UK/Chinese industries. Pre-commercial WHR prototypes have been developed and tested in demonstration eco-buildings, in the UK and China. Over the past 10 years, investigation on evaporative psychrometric energy core (PEC) cooling system has been carried out by UNOTT in collaboration with PCM, ZED Ltd, ISAW (China) and Monodraught Ltd. These works have been reported in several journals and international conferences proceedings, and with patents granted^{16, 17}. In addition, several evaporative psychrometric energy core (PEC) cooling prototype systems have been evaluated under real climatic conditions in domestic/commercial and industrial buildings (e.g., food/agriculture). The investigation on thermal energy storage using PCM has been carried out by the proposed project consortium, under EC Marie Curie and industry funded projects, with several prototype demonstrations in buildings carried out, and a commercial product (CoolPhase system) developed. These works have been reported in several publications and a patent application¹⁸. Apart from membrane wrapping, surface coating, PCM and lighting devices which are commercially available, the technologies have already been at TRL 6 but they have not been put together as integrated solutions to retrofitting of domestic buildings. The TRL 6 technologies will be brought to TRL 7 during the fabrication and testing (WP 4) and the individual prototypes will then bring the technologies to TRL 7 (system prototype demonstration in operational environments). Business models will be developed for the technologies (WP 7) to take them to the next stage as TRL 8 – System complete and qualified to TRL 9 – Actual system proven.

8 Risk assessment

Based on the Grant Agreement, the Dissemination & Exploitation Group (DEG) of the SUREFIT project will assess the potential risks remaining with the project progress. It is understood that risks can never be eliminated but can be reduced to an acceptable level. Risk Management is therefore required throughout the project timing. To do this, the Coordinator and Work Package leaders will work together to continuously monitor and identify the potential areas when risks may occur. During the project progress, the Work Package leaders and the Coordinator will be responsible for implementation of any mitigation plan has been set for any risk. Meanwhile, the work plan will be appropriately adjusted to reflect the possible minor technical or functional changes. If significant risks appear, a series of discussions among the general assembly members will be arranged to agree on the associated major changes on the project plan.

The risk assessment procedure includes the following steps: identification of the risks, assessment of the likelihood of the risks, estimation of the impact in case that the risks will materialize, risk mitigation actions and finally, assessment of the rate that the risk will influence the project in case that the mitigation action will be performed.

As it can be seen from the two screenshots below (Figure 1 and Figure 2), there are six main categories of risks related to the exploitable results:

1) Technological risks, which include:

- Worthless result: ill-time disclosure.
- Worthless result: earlier patent exists.
- Worthless result: better technology/methodology exists.
- Significant dependency on other technologies.
- The life cycle of the new technology is too short.
- Result aiming at replacing existing and well-entrenched technologies.

2) Partnership risks:

- Disagreement on further investments: some partners may leave.
- Industrialization at risk: no manufacturer for the result.
- Industrialization at risk: an industrial partner leaves the market.
- Industrialization at risk: a partner declares bankruptcy.
- Disagreement on ownership rules.
- Partners on the same market.

3) Market risks:

- Exploitation disagreement: partners on the same market.
- Exploitation disagreement: partners with divergent interests.
- Worthless result: performance lower than market needs.
- Nobody buys the product. Nobody needs it.
- Nobody buys the product. Too expensive.
- Nobody buys the product. Unsuitable sales force.
- Nobody buys the product. The project hits against a monopoly.

- Nobody buys the product. Problems at the time of first sales.

Nobody buys the product. Rejected by the end-users.

	A	B	C	D	E
	Risk identification for exploitable result Number... (partner...)	Likelihood (how possible is that this risk will materialize?)	Impact (what will be the impact if this risk will materialize?)	Mitigation (what are the actions from your side in order to mitigate this risk?)	Success rate (if the mitigation action is performed, what is the rate that the risk will influence the project (1 being the lowest and 10 highest possible rate))
1					
2	1. Technological risks				
3	1.1 Worthless result: ill-timed disclosure.				
4	1.2 Worthless result: earlier patent exists.	rare			
5	1.3 Worthless result: better technology/methodology exists.	unlikely			
6	1.4 Significant dependency on other technologies.	moderate			
7	1.5 The life cycle of the new technology is too short.	likely			
8	1.6 Result aiming at replacing existing and well entrenched technologies.	almost certain			
9	2. Partnership risks				
10	2.1 Disagreement on further investments: some partners may leave.				
11	2.2 Industrialization at risk: no manufacturer for the result.				
12	2.3 Industrialization at risk: an industrial partner leaves the market.				
13	2.4 Industrialization at risk: a partner declares bankruptcy.				
14	2.5 Disagreement on ownership rules.				
15	2.6 Partners on the same market.				
16	3. Market risks				
17	3.1 Exploitation disagreement: partners on the same market.				
18	3.2 Exploitation disagreement: partners with divergent interests.				
19	3.3 Worthless result: performance lower than market needs.				
20	3.4 Nobody buys the product. Nobody needs it.				
21	3.5 Nobody buys the product. Too expensive.				
22	3.6 Nobody buys the product. Unsuitable sales force.				
23	3.7 Nobody buys the product. The project hits against a monopoly.				
24	3.8 Nobody buys the product. Problems at the time of the first sales.				
25	3.9 Nobody buys the product. Rejected by end-users.				

Figure 1 Technological, partnership and market risks (screenshot of the excel file of the Risk Assessment).

4) Legal rights:

- Legal problems proceeding against Consortium.
- Legal problems: we are sued for patent infringement.
- Know-how risks: it is easy to counterfeit the patent.
- Know-how risks: a counterfeit cannot be proved.
- Know-how risks: the patent application is rejected.

5) Management and financial:

- Nobody buys: Our licensee is not exploiting his exclusive license.
- Know-how risk: there are leaks of confidential information.
- Multiple change to original objectives.
- Lack of awareness of risk management.
- Inadequate communication among partners.
- Inadequate reporting procedures.
- Off time supply of financial means.
- Weak exploitation. Inadequate business plan.

6) Environmental, regulation, safety and other risks:

- Nobody buys the product. Does not comply with the standards.
- Nobody buys: standards to make it compulsory don't yet exist.

- Research is socially or ethically unacceptable.
- Influence of laws and regulations.

The above risks should be considered for every Key Exploitable Result of the SUREFIT, the outcome of this consideration will be expressed by collecting the appropriate answer from dropdown lists in the excel file shown in the screenshots and finally, the results will be depicted as priority maps shown in the following Figures.

	A	B	C	D	E
	Risk identification for exploitable result Number... (partner...)	Likelihood (how possible is that this risk will materialize?)	Impact (what will be the impact if this risk will materialize?)	Mitigation (what are the actions from your side in order to mitigate this risk?)	Success rate (if the mitigation action is performed, what is the rate that the risk will influence the project (1 being the lowest and 10 highest possible rate))
1					
26	4. Legal rights				
27	4.1 Legal problems proceeding against Consortium.				
28	4.2 Legal problems: we are sued for patent infringement.		insignificant		
29	4.3 Know-how risks: it is easy to counterfeit the patent.		minor		
30	4.4 Know-how risks: a counterfeit cannot be proved.		moderate		
31	4.5 Know-how risks: the patent application is rejected.		major		
32	5. Management and Financial		catastrophic		
33	5.1 Nobody buys: Our licensee is not exploiting his exclusive license.				
34	5.2 Know-how risk: there are leaks of confidential information.				
35	5.3 Multiple change to original objectives.				
36	5.4 Lack of awareness of risk management.				
37	5.5 Inadequate communication among partners.				
38	5.6 Inadequate reporting procedures.				
39	5.7 Off time supply of financial means.				
40	5.8 Weak exploitation. Inadequate business plan.				
41	6. Environmental, regulation, safety and other risks				
42	6.1 Nobody buys the product. Does not comply with the standards.				
43	6.2 Nobody buys: standards to make it compulsory don't yet exist.				
44	6.3 Research is socially or ethically unacceptable.				
45	6.4 Influence of laws and regulations.				

Figure 2 Legal rights, management and financial, environmental, regulation, safety and other risks (screenshot of the excel file of the Risk Assessment).

8.1 Risk assessment of the Exploitable result #1

The title of the Exploitable result #1 is **Optimum design, operation and control of renovation technologies** and University of Nottingham (UNOTT) is the main owner of this result. UNOTT has considered all risks that were set in the relevant excel file and has proposed mitigation actions for every risk. The derived priority map is shown below. For all risks, the risk grade was low to moderate, but since the success rate of the mitigation actions is evaluated as high (1-3), the priority is kept in the area of Low Risk (green area).

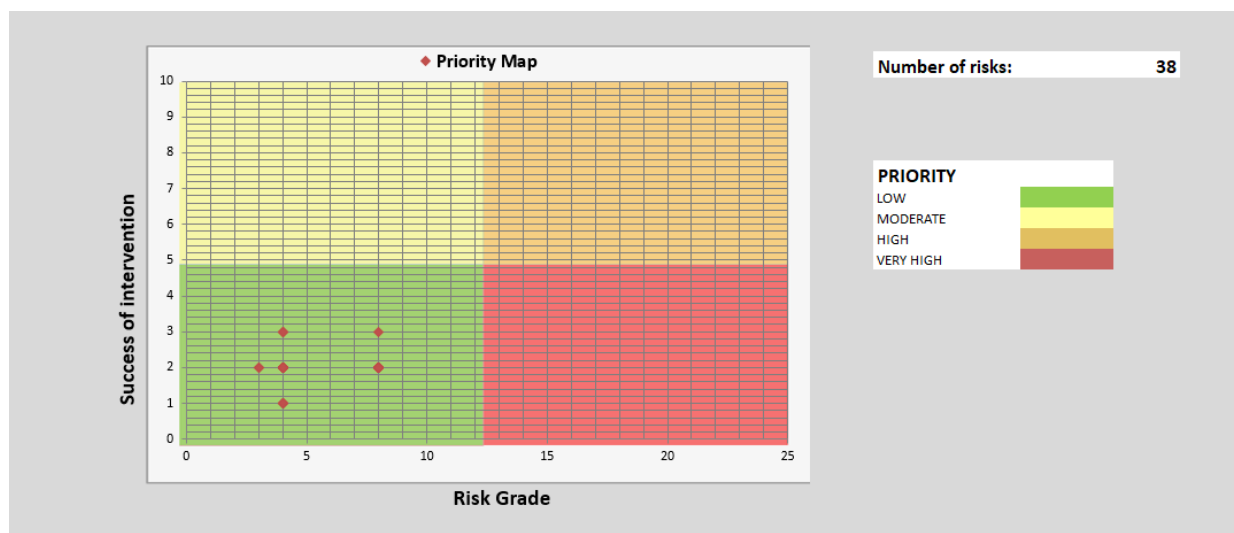


Figure 3 Priority map of the Exploitable result #1

8.2 Risk assessment of the Exploitable result #2

The Exploitable result #2 is **Renovation concepts** and the main owner is the University of AALTO. AALTO considered all the risks in the relevant excel file and proposed mitigation actions for every risks that this was meaningful. The Exploitable result #2 is intangible; therefore, not all risks were relevant to it. For all risks, the risk grade was low and only in few cases (technological risks) was moderate. In addition, the success rate of the mitigation actions is the highest (1); therefore, the priority is kept in the area of Low Risk (green area).

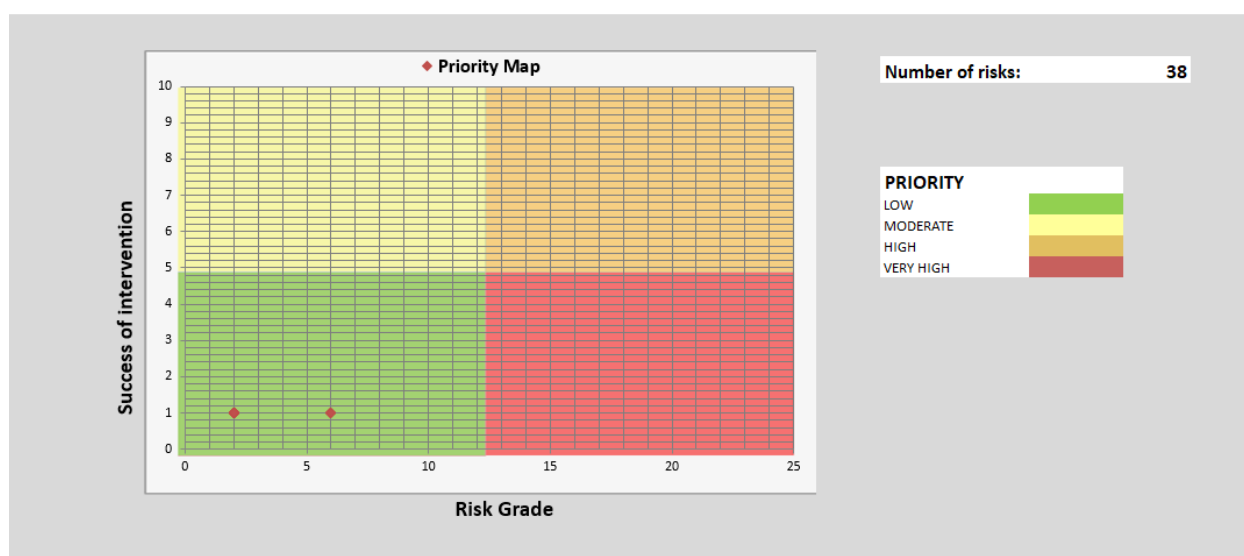


Figure 4 Priority map of the Exploitable result #2

8.3 Risk assessment of the Exploitable result #3

The Exploitable result #3 is **Next generation bio-aerogel panel** and the main owner is University of Nottingham (UNOTT). UNOTT considered all the risks mentioned in the relevant excel file and proposed mitigation action for every risk. The majority of the risks has a moderate grade, but since the success rate of the mitigation actions is evaluated as high (1-3), the priority is kept in the area of Low Risk (green area). The priority map of Exploitable result #3 is shown in the next Figure.

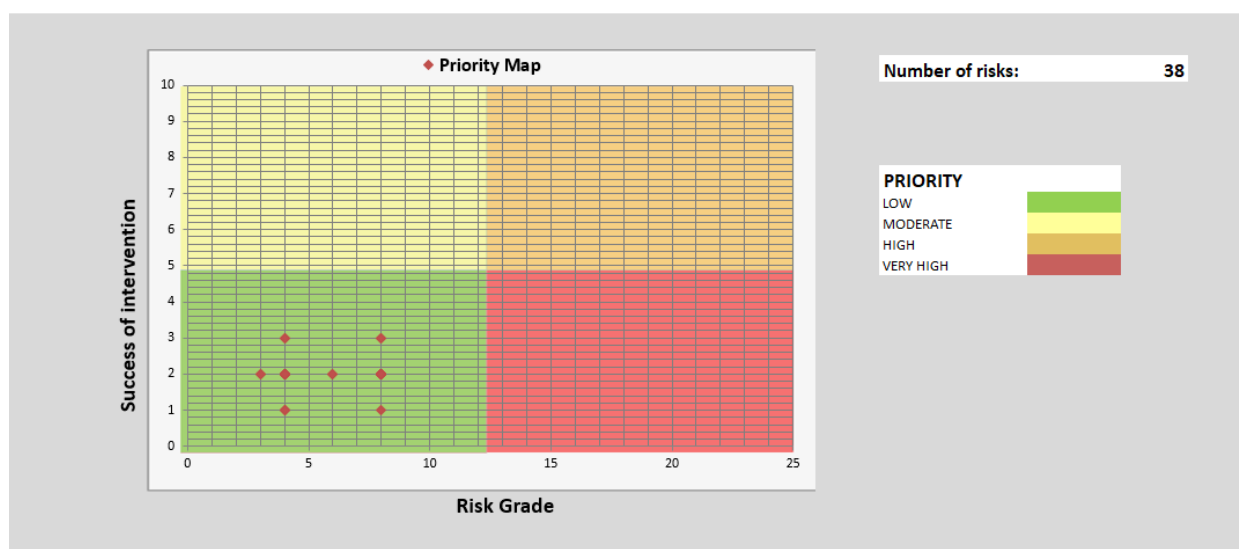


Figure 5 Priority map of the Exploitable result #3

8.4 Risk assessment of the Exploitable result #4

The Exploitable result #4 is the **PCM panels** and the main owner of this result is PCM Products Limited (PCM). PCM considered every risk of the relevant excel file and assessed the grade of the risks as low with the exception of two technological risks that were assessed of moderate grade. Also, PCM suggested mitigation actions for many of the risks. The success of the mitigation actions is the highest (1), so the priority is kept in the area of Low Risk (green area). The priority map of Exploitable result #4 is shown in the next Figure.

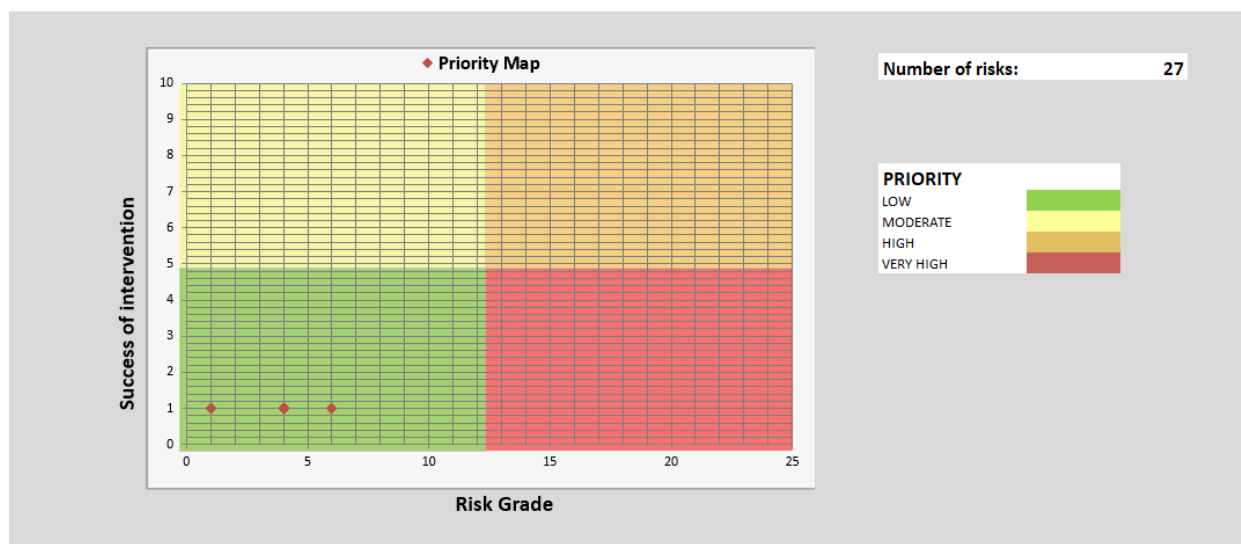


Figure 6 Priority map of the Exploitable result #4

8.5 Risk assessment of the Exploitable result #5

The Exploitable result #5 is **PV vacuum glazing windows (PV-VG)** and UNOTT is the main owner of the result. UNOTT considered all the risks mentioned in the relevant excel file and proposed mitigation action for every risk. Half of the risks are of low grade and half of moderate, mitigation actions have been considered for every risk and the success of the mitigation actions was assumed to be high (1-3). Therefore, the priority is kept in the area of Low Risk (green area). The priority map of Exploitable result #5 is shown in the next Figure.

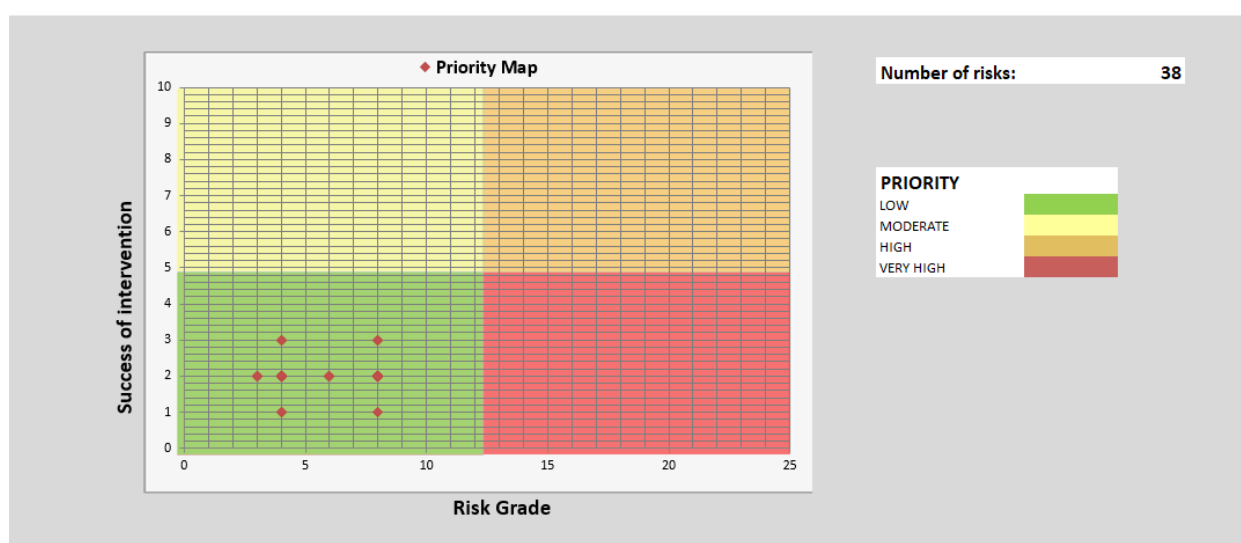


Figure 7 Priority map of the Exploitable result #5

8.6 Risk assessment of the Exploitable result #6

The Exploitable result #6 is **Solar thermal and PV systems** and Solar Energy Corp. (SOLIMPEKS) is the main owner of the result. SOLIMPEKS considered and assessed all risks of the relevant excel file and also, proposed mitigation actions for all risks. The majority of risks have moderate grade, while seven risks are assessed to be of high grade and one of very high, which belong in the category of partnership risks. The success of the mitigation actions are considered are high to medium (1-4), therefore the priority is kept in the area of Low Risk (green area), except one which is in the area of Very High Risk (red area). The priority map of Exploitable result #6 is shown in the next Figure.

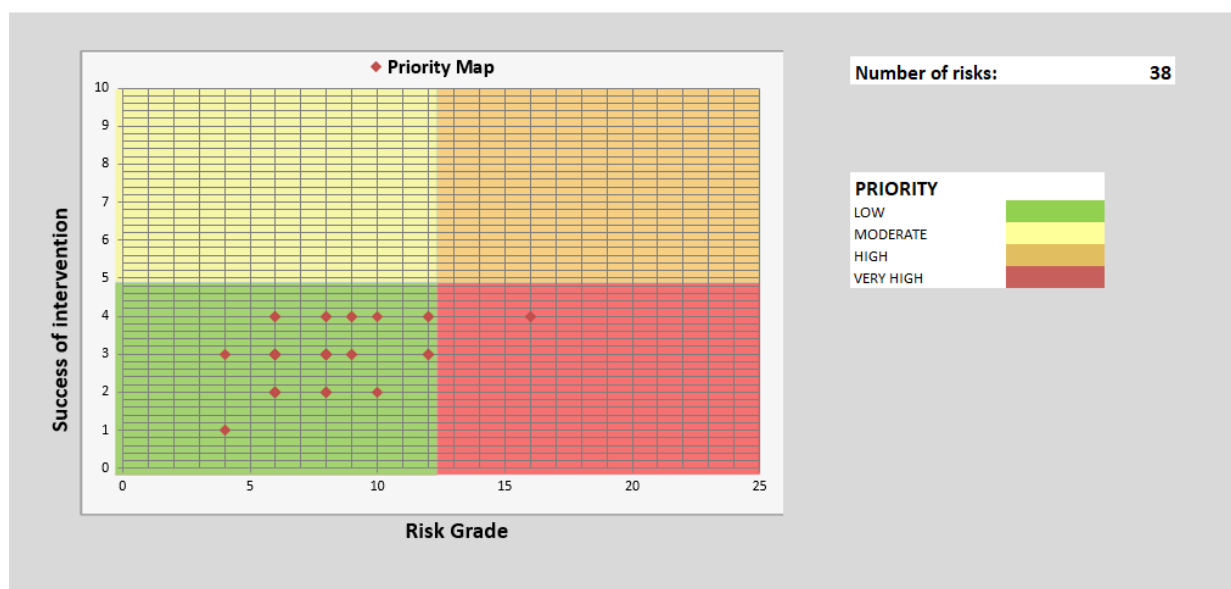


Figure 8 Priority map of the Exploitable result #6

8.7 Risk assessment of the Exploitable result #7

The Exploitable result #7 is **Window heat recovery devices** and UNOTT is the main owner of the result. UNOTT considered every risk of the relevant excel and proposed mitigation actions for every risk. Most of the risks are of low grade and the rest are of moderate grade. The success of the mitigation actions assumed to be high (1-3), therefore, the priority for every risk is kept in the area of Low Risk (green area), as it can be shown in the next Figure.

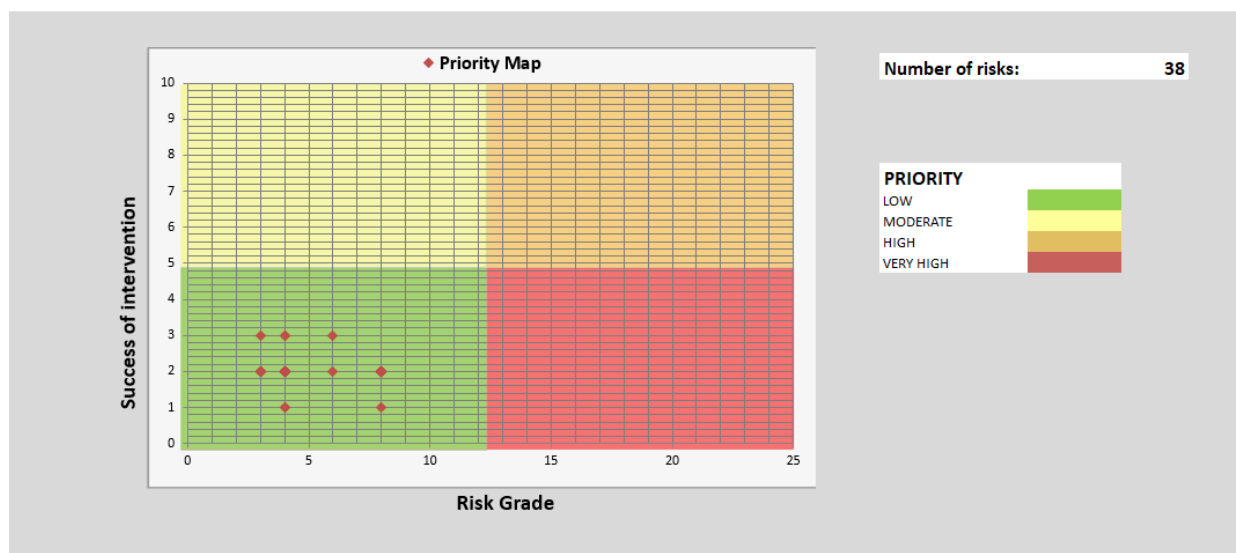


Figure 9 Priority map of the Exploitable result #7

8.8 Risk assessment of the Exploitable result #8

The title of the Exploitable result #8 is **Evaporative coolers** and the main owner is UNOTT. UNOTT considered all possible risks as they were defined in the relevant excel file and provided mitigation actions for every risk. The majority of the risks appeared to be of low grade and the rest of moderate. The success of the mitigations actions are considered as high (1-3) and the priority for every risk is kept in the area of Low Risk (green area), as it can be shown in the next Figure.

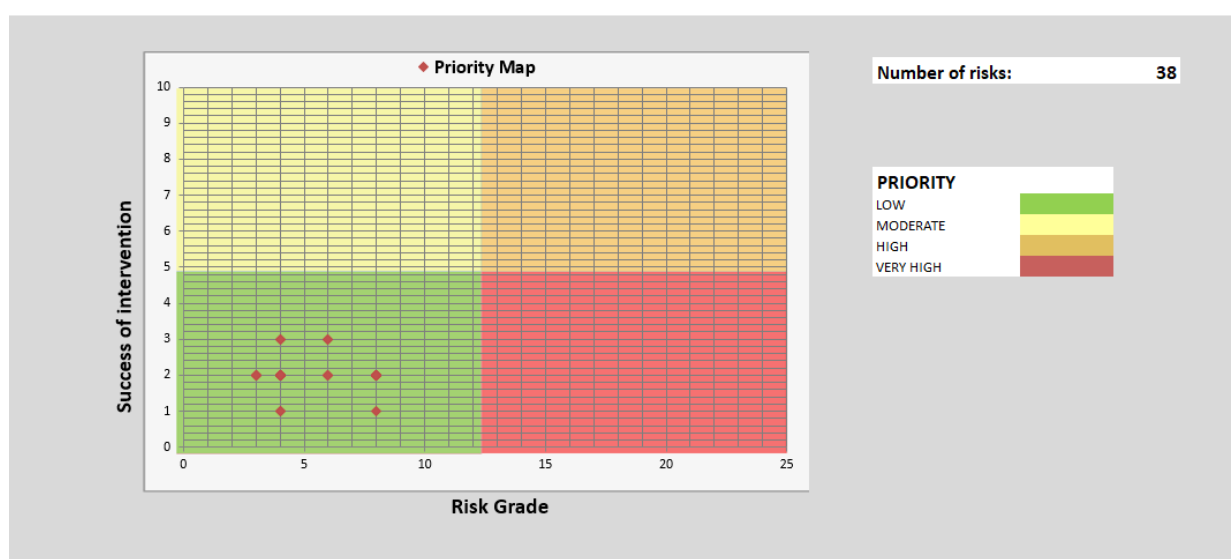


Figure 10 Priority map of the Exploitable result #8

8.9 Risk assessment of the Exploitable result #9

The Exploitable result #9 is **Membrane wrapping** and Winco Technologies (WINCO) is the only owner of this result. WINCO considered almost all risks of the relevant excel file and proposed mitigation actions only for four risks: worthless results – earlier patent exists, industrialization at risk - no manufacturer for the result, worthless result - performance lower than market needs and nobody buys the product - too expensive. As it can be seen in the priority map in the Figure below, three risks are in the Low Risk (green area) and one (Nobody buys the product-too expensive) is in the limit between the Low and Moderate Risk (yellow area).

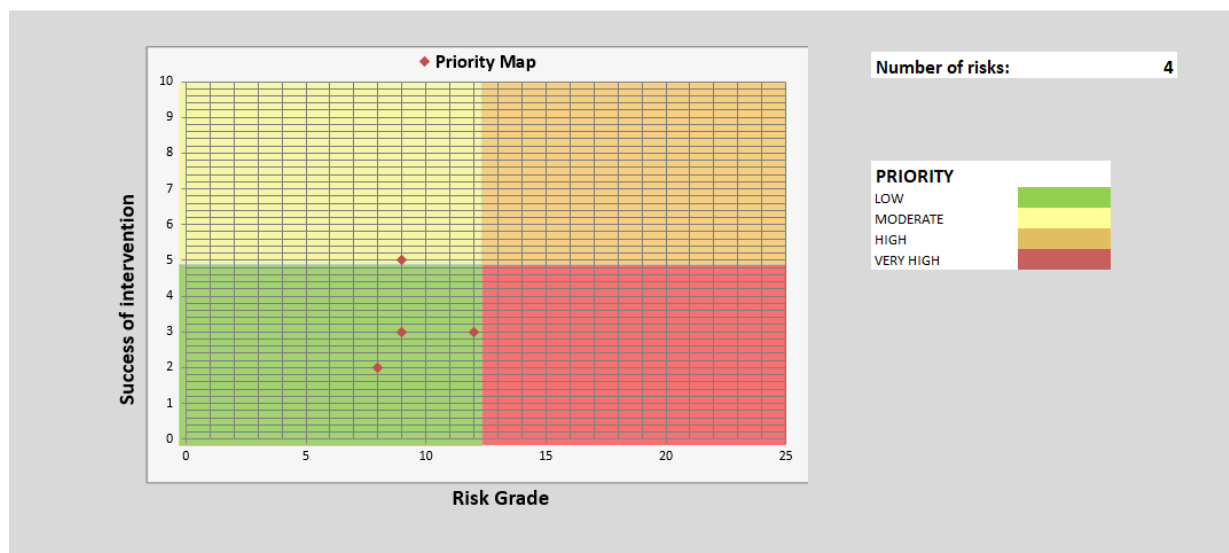


Figure 11 Priority map of the Exploitable result #9

8.10 Risk assessment of the Exploitable result #10

The Exploitable result #10 is **Innovative multi-purpose heat pumps** and University of Nottingham (UNOTT) is the main owner of this result. UNOTT considered all risks of the relevant excel file and proposed mitigation actions for all risks. The risk for the majority of cases is characterized as moderate and the rest as low, while the success of the mitigation actions is high (1-3), therefore all risks are in the area of Low Risk (green area) in the priority map below.

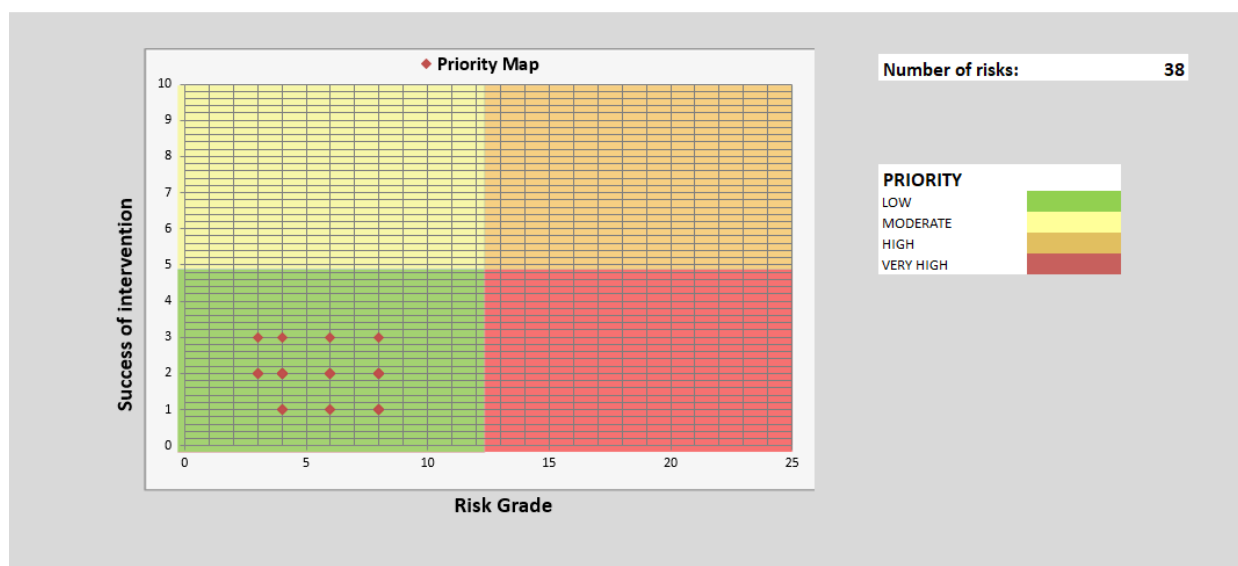


Figure 12 Priority map of the Exploitable result #10

8.11 Risk assessment of the Exploitable result #11

The Exploitable result #11 is **User friendly computer program for planning and retrofitting of residential buildings** and Instituto de Soldadura e Qualidade (ISQ) is the owner of this result. ISQ considered all risks of the relevant excel file and proposed mitigation actions for all risks. The risks vary from low up to high, while the success of the mitigation actions also varies from 1 up to 7. As it can be seen in the priority map below, most of the risks lie in the area of Low Risk (green area), two in the area of moderate risk (yellow area) (*Partners on the same market* and *Nobody buys the product-rejected by the end users*) and one in the area of high risk (red area) (*Worthless result: performance lower than market needs*).

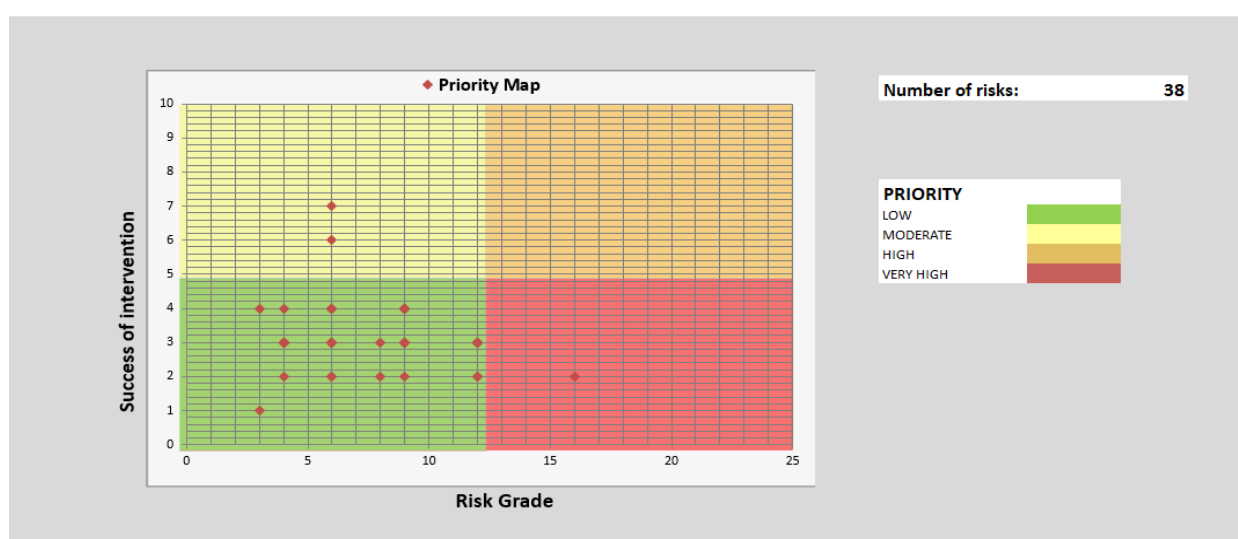


Figure 13 Priority map of the Exploitable result #11



8.12 Risk assessment of the exploitable result #12

The result #12 is ***Methodology and guidelines for retrofitting*** and the main owner is Instituto de Soldadura e Qualidade, (ISQ). After thorough consideration, ISQ came to the conclusion that there is no need for a risk analysis for this particular result due to the fact that this will be an Open Research Data Pilot (ORDP).

8.13 Risk assessment of the exploitable result #13

The result #13 is ***Integration of daylight and electric lighting*** and KÖSTER Lichtplanung Ltd (KOST) is the only owner of this result. KOST has fully established, patented and available for the customers, lighting technologies as well as the relevant control systems. The interesting parameter for Koester could be how to integrate the daylight with the electric lighting in the demo buildings of the SUREFIT project and also, how its system will work as integrated solution with the rest of the Surefit technologies. Therefore, Koester considers that the result #13 shouldn't be subject of risk assessment.

9 First individual exploitation plans

1. Instituto de Soldadura e Qualidade, (ISQ)

Description: ISQ is a private non-profit making technological association with Public Utility status. ISQ's mission is to contribute to the constant improvement of industry and services, resulting in an expanded international presence, by collaborating with the state, regional councils and businesses with regard to the sharing and development of technology, new products and processes, structured management practices and quality control, hygiene and safety, energy conservation and environmental protection, and systematic maximization of human resources. The strategy of ISQ growth goes through an increasingly important and sustained presence in the world having offices, branches and affiliates in 20 countries. ISQ, through its Research, Development and Innovation (R&D+i) Direction provides technical expertise to support companies on research and innovation activities, promote sustainability and contribute to their constant improvement. The mission is to research and develop innovative and integrated solutions aimed at enhancing skills, increase differentiation, and maximise sustainability added values. Its implementation involves the development of technology, new products and processes, the application of structured management practices and quality control, hygiene and safety, energy efficiency and environmental protection, and a systematic maximisation of human resources. ISQ R&D+i competences are focused on one single goal: to promote the exchange of knowledge between the scientific institutions and business sectors, contributing to the implementation of sustainable development in European companies.

Background bringing to the project & main role(s) in the project: ISQ R&D+i team has large experience in areas which are very relevant to the proposed SUREFIT project, namely, energy and resource efficiency, energy measurement, verification and auditing, decision support tools, process optimization, eco-efficiency assessments and methodologies, innovative business models and training. ISQ is responsible for the overall management and coordination of the project. ISQ has high level of expertise on project management, as a coordinator of many EU projects. In addition, use its expertise in energy monitoring, in evaporative cooling and heat recovery modelling to determine the optimal sizes of evaporative coolers and window heat recovery devices for building retrofitting as well as business models development.

IPR attached to the background: No background of ISQ shall be shared with another partner in the SUREFIT Consortium for implementation of the Project or Exploitation of that other partner's results, therefore no IPR issue exists.

Expectations: ISQ R&D+i has a long-term relationship with Industry (and other sectors), due to more than 20 years of work supporting their sustainable development. This synergetic collaboration allows ISQ R&D+i to understand the industrial demands and concerns regarding energy, resources, environment, economic and social aspects that are key for sustainability. More specifically, ISQ will have new lines of products i.e. evaporative coolers and window heat recovery devices for energy efficient cooling and thermal recovery.

Potential Customers: Companies related to energy, resources, environment etc.

2. Advanced Management Solutions Ltd, (AMS)

Description: AMS is a SME, founded in 1999 and established its current legal form in 2004 with the goal to provide state-of-the-art consultancy & technical services inextricably linked with the Research, Development & Production of novel energy efficient procedures & materials contributing to the constantly increasing demand of “eco-friendly”, energy efficient and “value for money” novel products to a rapidly forward moving world. AMS activities are focused on three main areas: 1) “Turnkey eco-solutions” improving the energy efficiency of the buildings, including basic (architectural, structural) and/or advanced (E/M) design; building maintenance; energy consumption monitoring; BMS applications & integration; building elements monitoring and simulation modelling in materials and building’s energy behaviour; data analysis and their interpretation either by modeling or by real time systems to BMS systems, 2) Research, development, production, integration and application of various environmentally friendly materials with advanced properties to improve energy efficiency, including novel insulating materials, PVC, resins, PCM’s, mortars, plasters, coatings, geopolymers, composite building systems, etc. and 3) the 3D printing technology and its application in various fields, like designing and constructing customised 3D printers and CNC machines, providing 3D printing services and being the retailer of 3D printers. The last 11 years AMS has been active in 13 European Funded Projects and has participated in various Collaborative Projects with both industrial partners and Institutes from all Europe, mainly focused in energy efficiency either through the development of new materials or new processes with very promising results. Also, at National level AMS collaboration with the most technologically advanced Institutes and Universities in various fields e.g. novel raw materials, nanotechnology, industrial wastes’ exploitation, etc., is providing the company the ideal environment to continue RD&I activities in parallel with the ongoing R&D executed in H2020 Framework.

Background bringing to the project & main role(s) in the project: AMS has vast experience in EU funded projects in the field of the Energy Efficient Buildings, therefore will make use of its experience on innovation & technology exploitation to assess the economic, social and environmental benefits of the technologies and to lead the dissemination and exploitation of the results from the project. It will also conduct risk assessment for the proposed systems. Besides, AMS will develop a business model for the technologies. In addition, it will develop and maintain a website for the project. Finally, AMS will use its experience in buildings’ construction works in order to install the technologies of SUREFIT in a building in Athens.

IPR attached to the background: No background of AMS shall be shared with another partner in the SUREFIT Consortium for implementation of the Project or Exploitation of that other partner’s results, therefore no IPR issue exists.

Expectations: AMS expects to increase its experience and enhance its expertise in the field of Energy Efficient Buildings regarding both, technological and exploitation and marketing aspects.

Potential Customers: Individuals as direct clients and every company in the building construction sector and renovation sector.

3. University of Nottingham, (UNOTT)

Description: University of Nottingham is a research-led University in the United Kingdom with annual research awards totaling €190 million. It has the largest number of top-rated (by Higher Education Funding Council) Departments in UK Universities for research following Cambridge, Oxford and London Universities. It is the home of many groundbreaking discoveries and inventions such as magnetic resonance imaging, and is the 4th ranked UK University for research grant income from private industry. The University of Nottingham's successful track record in transferring technologies to the marketplace has been recognised with the UK's most prestigious corporate accolade, The Queen's Award for Enterprise in the category of Innovation in 2007. The University of Nottingham also won the award for 'Outstanding Contribution to Sustainable Development' at the Times Higher Education Awards 2012, The University's Carbon Management Plan saw more than £1.5m invested in 71 carbon reduction projects in its first year. The University of Nottingham was also declared the winner for 'International Strategy' at the Guardian University Awards competition in 2013, which encompasses the creation of research partnerships, an extensive network of global commercial partners and its campuses in Malaysia and China. The University has strategic partners in 25 countries and 37% of research income is obtained internationally. The University of Nottingham has participated extensively in over 300 EU FP7 funded research projects and the Department of Architecture and Built Environment (DABE), Faculty of Engineering has conducted over 35 EU FP7 research projects. In the Faculty of Engineering, UNOTT more than 98% of research is of international quality, with 85% graded as 'world-leading' or 'internationally excellent'. DABE has been working on green retrofits projects funded by the UK government and industry. The sustainable energy technologies developed at the DABE, UNOTT by Professor Riffat and the industry have been recognised among the finest examples of new innovations aimed at reducing global warming and tackling climate change. The DABE, UNOTT won two prizes at the Rushlight Awards 2013, for innovations on low carbon buildings and sustainable technologies.

Background bringing to the project & main role(s) in the project: UNOTT will lead the development of computer design tools and optimisation algorithms, and will use its extensive experience on modelling, design and management of building materials. It will use its knowledge on computer modelling of fluid flows and heat transfer to lead the simulation team that will inform the design and production of the prototype technologies. It will use its knowledge and skills in design and manufacturing of energy efficient technologies to carry out optimal sizing of bio- aerogel panels and evaporative coolers, produce the technologies for integration, test the technologies under controlled conditions and install the technologies in buildings. UNOTT will use its knowledge on sustainable architecture and sustainable development to design the novel envelope technologies, so that both an aesthetic and cost-effective solution is obtained. UNOTT will also be responsible for prototype assembling and pre-testing, installation and performance monitoring in a building in the UK where mainly heating would be required. In addition, UNOTT will use their knowledge and experience in HVAC and heat pump systems, to design and develop the multipurpose heat pumps for retrofitting residential buildings.

IPR attached to the background: No data, know-how or information of UNOTT shall be needed by another party for implementation of the project or exploitation of that other party's results.

Expectations: UNOTT will develop two new types of heat pump (DX-SAHP and TP-GSHP) for hot water, heat recovery and thermal storage. Also, UNOTT will have new lines of products i.e. evaporative coolers and window heat recovery devices for energy efficient cooling and thermal recovery.

Potential Customers: Industrial sector relevant to the abovementioned field i.e. heat pumps, evaporative coolers and window heat recovery devices.

4. SOLIMPEKS Solar Energy Corp. (SOLIMPEKS)

Description: SOLIMPEKS is a market leading provider of cutting edge technology in the solar energy field, established in Konya (Turkey) in 2009. It is part of a global network expanding over 70 countries, with over 40 years of experience in developing, manufacturing and distributing high end products for commercial and residential use. SOLIMPEKS manufactures the highly acclaimed aesthetically appealing Hybrid PV-Thermal (PV/T) solar collectors to achieve both hot water and power generation from the sun as a clean and free energy source. A combination of solar PV and solar thermal in a single unit, it is capable of delivering twice as much renewable energy in the same rooftop footprint as standard solar, therefore also delivering twice as much carbon displacement. Nowadays SOLIMPEKS has offices in Germany, Spain, Australia, Mauritania and Algeria and another production facility in Kenya, SOLIMPEKS Africa, for the African market. Due to its excellent performance in the PV/T sector, it began to attract supports from both regional and national institutions notably Local Turkish Investment Office (MEVKA) and The Scientific and Technological Research Council of Turkey (TUBITAK). The actual model of energy consumption, using combustible fossil fuels, is completely unsustainable. Among the solutions to the global energy issues, the utilisation of solar energy is, without a doubt, one of the most encouraging ecological avenues. To achieve this goal, the strategy adopted by SOLIMPEKS is to offer a variety of educational opportunities and resources for engineers, designers, contractors, technicians, installers and student through SOLIMPEKS Academy.

Background bringing to the project & main role(s) in the project: SOLIMPEKS will use its knowledge and manufacturing facility to carry out optimal sizing of PV vacuum glazing, PV and solar thermal, produce the technologies for integration and test the technologies under controlled conditions. SOLIMPEKS will also actively disseminate/exploit the SUREFIT systems in Eastern Europe and will be marketing the SUREFIT systems in Turkey using their existing routes to market.

IPR attached to the background: No data, know-how or information of SOLIMPEKS shall be needed by another party for implementation of the project or exploitation of that other party's results.

Expectations: Marketing the SUREFIT systems in Turkey.

Potential Customers: Building Construction Sector, Engineers

5. Winco Technologies (WINCO)

Description: Founded in 1988, WINCO Technologies is a French company specialized in thermal and acoustic insulation. Acting in different countries all over Europe, Asia and America, WINCO Technologies has historical partnerships in automotive, iron and steel, petrochemical and military industries. In 2003, WINCO Technologies decided to share its know-how to the world of construction by providing innovative thermal insulation solutions. Based upon permanent innovation, responsibility and entrepreneurship, WINCO Technologies vision is to improve energy efficiency, comfort and safety. More recently, WINCO Technologies developed a wide range of Phase Change Materials (INERTEK) available in powder and emulsion forms. Designed to store and release thermal energy, INERTEK microcapsules can provide customized solutions for various applications in construction, electric, automotive, industry, security, textiles and many more. INERTEK melting point can be set from 0°C to 80°C according to application and specification, providing opportunities in the preservation of energy for a desired range of temperatures. WINCO Technologies is the first French company to have developed a ready-mix plaster, Thermo Confort, including 50% of PCM for indoor application on walls and ceilings. This product is based on a micro encapsulation technology of hydrophobic vegetal oil. INERTEK microcapsules are designed to absorb heat above a preset temperature and release energy below it. A medical center in Brittany has been recently instrumented to measure the benefits on comfort and energy savings. This interior plaster is also listed on Design Builder, the dynamic thermal simulation software. WINCO Technologies R&D department is also specialized in the design of specific micro encapsulation solutions.

Background bringing to the project & main role(s) in the project: WINCO (an SME) together with CJR will use its expertise in insulation technology to produce bio-aerogel panels for insulation of walls and floors of the existing buildings. It will also use its knowledge and manufacturing facility to optimise, design and the breathable membranes.

IPR attached to the background: No data, know-how or information of WINCO shall be needed by another party for implementation of the project or exploitation of that other party's results.

Expectations: WINCO as an insulation developer and manufacturer will have a new possible product, i.e. the bio-aerogel panels, for insulating walls and floors of residential buildings.

Potential Customers: Building Construction & Renovation Sector, Engineers

6. PCM Products Limited (PCM)

Description: PCM Products Ltd. (PCM) specializes in phase change material (PCM) technologies/HVAC systems and their applications. The company has research and development facilities and manufacturing base in the UK and license outlets around the world which offer bespoke products to meet unique customer and application requirements. The company has expertise in chemicals and materials including desiccants, PCMs and adsorbents. PCM is committed to providing alternatives and improvements to current storage, heating/cooling technologies by offering more energy efficient and environmentally-acceptable solutions. For more than a decade, the company has been involved in the development of PCMs, energy storage, desiccant and HVAC systems. With unrivalled

experience in designing and advising on PCM storage installations and applications, it continues to push the boundaries in desiccant materials usage for the benefit of its ever-growing customer base. In addition, PCM Products Ltd has been providing full consultancy and product development services for more than two decades.

Background bringing to the project & main role(s) in the project: PCM will use its knowledge and manufacturing facility to optimise, design and produce the PCM for thermal storage and management, providing in-house developed PCM materials. PCM will also assist on all dissemination and technology transfer related activities within the consortium which have an influence on the exploitation of the results (patents, licenses, dissemination activities, etc.) and will also assist in coordinating negotiations concerning exploitation issues between the consortium and external parties.

IPR attached to the background: No data, know-how or information of PCM shall be needed by another party for implementation of the project or exploitation of that other party's results.

Expectations: Build on current PCM product portfolio by developing new applications of thermal energy storage.

Potential Customers: Individuals, building & renovation sectors & industrial

7. KÖSTER Lichtplanung Ltd (KOST)

Description: KÖSTER Lichtplanung Ltd.'s daylight technology is worldwide applied for more than 20 years with over 400,000 m² glass roofs and facades. Here are some of the recent construction projects with daylight systems from the office KOST Lighting design: Bank Santander in São Paulo/Brazil; BlueWin Tower in Zurich / Switzerland; Headquarters of the SCHOTT Glass AG, Mainz/Germany; Highrise of the Energie AG, Linz/Austria; Triple Towers, Sofia/Bulgaria; Kassenärztliche Vereinigung KVV, Dortmund/Germany; Standard Bank of South Africa, Johannesburg/South Africa; Central Bank of Kuwait; Laboratory building Hoffmann-La Roche, Basel/Switzerland; Building projects in Beijing/China; Office building BNP-Paribas, Paris/France.

Background bringing to the project & main role(s) in the project: KÖSTER Lichtplanung Ltd will use its expertise in daylighting and light technologies to design and develop daylighting aspects of the facade systems.

IPR attached to the background: Patent

Expectations: KOST will have the new energy efficient designs and products for lighting systems to provide adequate lighting for a room space while avoiding glare.

Potential Customers: Individuals

8. Fundación Santa María la Real, (FMS)

Description: Santa María la Real Foundation is a non-profit organization founded in 1977, whose fundamental mission is to promote sustainable development initiatives based on heritage and the natural and human environment of this heritage. It undertakes interdisciplinary works on the patrimony objects restoration, including architects, engineers, historians and restorers. Main activities are related to restoration or conservation of the old buildings, preserving their integration in a natural environment. Today, the institution has become a prime example that heritage can fuel economic development in an area. Moreover, the Santa María la Real Foundation has created a development model based on heritage that is being successfully exported to other places, regions and countries. In each and every one of Fundación Santa María la Real departments encourages the generation of ideas and projects based on the principles of quality, efficiency, and innovation so that heritage itself can become an element in generating socio-economic development.

Background bringing to the project & main role(s) in the project: Santa María la Real Foundation will use the knowledge in Monitoring Heritage System to collaborate in façade technology development and installation and monitoring the technology in a building in Spain.

IPR attached to the background: No data, know-how or information of FMS shall be needed by another party for implementation of the project or exploitation of that other party's results.

Expectations: FSM as a management organisation for residential buildings will be interested in using the proposed technologies such as new generation of bio-aerogel panels, the new types of heat pumps, the surface coatings etc. for retrofitting of residential buildings.

Potential Customers: N/A

9. Aalto University, (AALTO)

Description: The New Energy Technologies Group (NEW) at Aalto University (formerly Helsinki University of Technology) in Espoo- Otaniemi, Finland is actively involved with the science and research of advanced energy technologies and systems. The Group has some 20 members working on solar cells, fuel cells and urban energy systems, including materials and complex systems work. The Group has worked in the past with PV-facades, BIPV technologies, Intelligent Buildings, Building Energy Simulations, Solar Cities, Polygeneration, among others. The New Group has operated in the past a test site for multifunctional facades, in particular advanced PV designs, such as thin film PV, translucent PV, and PV façade elements. This included also a fully-controlled PV testroom. The Group has several in-house simulation codes for advanced building energy simulations, incorporating multifunctional façade elements to whole building simulation environment including a range of building related RES technologies. This includes also polygeneration systems. The Lab facilities include a wide range of analysis equipment for solar cells and material testing research. These comprise accurate spectrometric equipment, several environmental chambers, solar simulators, etc. The Group has access to other key facilities at Aalto University such as the Microscopy center, Energy Garage (a platform and building for larger technology-relevant testing).

Background bringing to the project & main role(s) in the project: AALTO (academia) is strong in promoting and coordinating basic and applied research relating to the processes of rational use of energy sources and will carry out life cycle energy analysis of all technologies and model energy demand of buildings. Its experience fits well with retrofitting a building in Finland and monitoring the retrofitted building.

IPR attached to the background: No data, know-how or information of AALTO shall be needed by another party for implementation of the project or exploitation of that other party's results.

Expectations: AALTO will enhance its expertise in modelling cost effective renovation scenarios.

Potential Customers: The cost effective renovation concepts is a result in which AALTO is involved that is not intended for commercial use.

10. Cândido José Rodrigues, SA (CJR)

Description: Founded in 1970, the CJR Group is a multinational business group, headquartered in Guimarães, Portugal, with projects in more than 20 countries. This group is segmented by two main companies, CJR, SA, being its core business the construction of roads and buildings and CJR Renewables, specialized on renewable energy sector. Over 50 years of operation, the company has been expanding its operational reach. The CJR, SA started its journey renting heavy machinery, an activity still in operation, alongside the construction of roads and infrastructures, becoming a full scope engineering and construction company, also acting on buildings, rehabilitation, urban projects and environmental projects. CJR Group is well known by its projects in engineering, construction and renewable energy.

Background bringing to the project & main role(s) in the project: As an engineering and construction company in the field of buildings, renewable energy and environment, CJR, S.A. will coordinate WP5 of installation of technologies in buildings, being the construction partner in Portugal. Moreover, CJR will focus on the production of prefabricated panels for building retrofitting, being also responsible for installation and performance monitoring in a building in Portugal. Its knowledge will contribute for the development of new solutions with purpose of energy saving.

IPR attached to the background: No data, know-how or information of CJR shall be needed by another party for implementation of the project or exploitation of that other party's results.

Expectations: CJR will have these new products to meet the requirements of building insulation and integration of the developed technologies into these panels for rapid retrofit.

Potential Customers: N/A

11. Oncontrol Technologies, LDA (ONCONTROL)

Description: Oncontrol Technologies is a SME dedicated to engineering, automation, control and information technology systems. The company has large expertise in designing and deploying control infrastructure to industry. The company offers services in all automation levels, from instrumentation to high level corporate information. The solutions include, energy

monitoring, advanced control, artificial intelligence and process monitoring & visualization. Oncontrol employs Artificial Intelligence, Machine Learning and Fuzzy logic, in its services to industry, in order to create value and gain insights from process and/or shop floor. The company has expertise in remote monitoring solutions, specializing in systems where a PLC-based control is needed. In these situations, our solutions provide data collecting and direct access to PLC for programming and system maintenance, which is different from other solutions in the market. The company has a complete portfolio of solutions to operational-technical-strategic levels. The company major success is an advanced control system, based on Fuzzy Logic, for mill optimization, to the cement and mining industry. Our control system has achieved improvements in the order of 4-10% and reduction of specific energy consumption (KW/ton) in the order of 5-20%.

Background bringing to the project & main role(s) in the project: In SUREFIT project Oncontrol Technologies is responsible for the development of control system (control design, development of algorithms and integration of control into prototypes), as well the development of hardware for data acquisition and control of active elements, and software interface for end-user and integrated system management. The role of ONCONTROL can be summarized in the following main objectives (1) Develop a control strategy for optimum operation of technologies integrated in buildings; (2) Design of control hardware for operation of technologies; (3) Develop control algorithms for operation of technologies; (4) Integrate control hardware and software in prototypes. In addition, participation in other tasks such as development, installation, demonstration, dissemination. For the control system, it is expected the use of our main technology on control systems, based on Fuzzy Logic in order to incorporate scientific and research knowledge, gathered from other partners, into the automatic control. If required, it is also planned to use Model-Predictive Control with the simulated model in order to confront the system parameters with the real data and check how to change the system in order achieve the desired status.

IPR attached to the background: No data, know-how or information of ONCONTROL shall be needed by another party for implementation of the project or exploitation of that other party's results.

Expectations: ONCONTROL as a designer and manufacturer of control solutions will have new products for HVAC, hot water and power generation.

Potential Customers: HVAC companies, architects.



10 Conclusions

The aim of this deliverable is to provide a first version of the exploitation plan for the SUREFIT project results. Towards this, the partners identified 13 key exploitable results. These results are mainly technologies i.e. PCM and aerogel panels, PV-VG, PV/T, breathable membrane, innovative multi-purpose heat pumps, but also related to retrofitting methodologies, i.e. computer program for planning and retrofitting of residential buildings, methodology and guidelines for retrofitting, etc. In addition, the partners performed a first characterization of these results by identifying their possible innovation, the possible customers if the result will be commercialized, the expected time that the results will reach the market, a price, any competitors etc. Furthermore, the relevant partners identified their expectations and claims for their results by using the BFMULO matrix and it is important to mention that every exploitable result has an exploitation intention. IPR issues and protection have also considered and also, a first attempt of the shares of each one of the results was made, that showed almost all results have 1 or 2 owners. The technology readiness level for almost all results is high 6-7 and is expected to reach 8-9 at the end of the project. Finally, a risk assessment performed for almost all results, which showed that the majority of results are of low risk concerning their exploitation potential

The exploitation plan will be updated during the implementation of the project in order to ensure a dynamic and successful exploitation of project results and another exploitation plan will be created in M40, where all project's aspects would be in the most mature face. Complementary to that, the commercialization plan will be part of the D8.4 that will be submitted at the end of the project.

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