

	EUROPEAN COMMISSION RESEARCH AND INNOVATION DG	Final Report
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Project Acronym: RetroKit

Project Full Name: RetroKit - Toolboxes for systemic retrofitting

Final Report

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D'APPOLONIA SPA

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Final Report

PROJECT FINAL REPORT

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Final Report

Please note that the contents of the Final Report can be found in the attachment.

4.1 Final publishable summary report

Executive Summary

RetroKit develops and demonstrates at three building pilots (Spain, Germany and Sweden), multifunctional, modular, low cost and easy to install prefabricated modules in order to significantly increase the EU retrofitting rate and contribute to EU energy reduction commitments. These innovative systems target existing multi-family residential buildings which represent more than 50% of the EU building stock and between 65% and 80% of its energy consumption. RetroKit project brings the aspect of multifunctional façade and roof elements into the retrofit sector. Special integrated solutions have been developed which are dealing with the aspects of heating, ventilation, cooling, electricity and ICT in a flexible way. The key factors for RetroKit are the window element with a technical box taking in HVAC systems and interfaces for building services (ducting, piping) installed on the existing façade, and façade modules integrating ventilation systems, heat/cold supply systems, piping for heating and cooling, ICT and electricity, and photovoltaic, solar thermal and PV/T collectors into thermal insulation for façade and roofing solutions. To be attractive beyond affordability, multifunctional semi-prefabricated elements are developed which provides an opportunity to retrofit improving aesthetics, comfort, energy performance, and property value at the same time.

Partners investigate and identified negative factors that prevent positive retrofit decisions and the conditions, requirements, information, arguments and human factor aspects for the implementation of the retrofit toolbox. Monitoring and analysis of the results demonstrated the effects of the solutions on the inhabitants. Retrofitting components and technologies have been developed and characterized and tested in lab and real scale environment in parallel to the development of an optimised construction retrofitting processes that minimise intrusion, maximise work to the exterior and cavities of the building, reduce the time and cost of retrofitting, and increase safety. LCA and LCC analyses were also made. The findings are integrated in the RetroKit Toolbox, a real set of modular (semi)prefab solutions, supported by a software enabling decision for retrofitting options. Possible users, barriers, optimal market and marketing strategies have been coupled with an effective route for exploitation of the toolbox. Demonstration activities in Madrid, Frankfurt and Pitea allow for the verification and refinement of the entire RetroKit methodology, several selected developed technological solutions, and the appropriate construction processes.

RetroKit benefits can be seen at different levels:

- at macro-level, by inducing important savings in terms of energy consumption and emissions and by increasing turnover for the benefit of the almost 3 million construction SMEs operating in building renovation with a consequent impact on job creation;
- as buying drivers for the apartment/building owners, as they can have clear economic savings in the energy bills and more attractive higher value properties, while at the same time avoiding the discomforts and burden often associated to retrofitting intervention;
- for the actors involved in the retrofitting supply chain, as new skills and profiles will be required, and new business opportunities can be generated.

Summary description of project context and objectives

RetroKit develops and demonstrates at three building pilots (Spain, Germany, Sweden), multifunctional, modular, low cost and easy to install prefabricated modules in order to significantly increase the EU retrofitting rate and contribute to EU energy reduction commitments. These innovative systems target existing multi-family residential buildings which represent more than 50% of the EU building stock and between 65% and 80% of their energy consumption. RetroKit project brings the aspect of multifunctional façade and roof elements into the retrofit sector. Special integrated solutions have been developed which are dealing with the aspects of heating, ventilation, cooling, electricity and ICT in a flexible way. The key factor for RetroKit is the window element accompanied with a technical box taking in HVAC systems as well as interfaces for building services (ducting, piping) installed on the existing façade.

To develop high technology efficient systems, we have selected and integrated into multifunctional prefabricated modules the most promising retrofitting technologies to include windows, insulation materials, HVAC systems, renewable energy systems and energy supply systems, extensively investigated by our market leaders STO, our research intensive SMEs BGTEC, KOKO and AMS, and leading RTOs FHG, SP, SINTEF and TECNALIA. The modules integrate ventilation systems, heat/cold supply systems, piping for heating and cooling, ICT and electricity, and photovoltaic, solar thermal and PV/T collectors into thermal insulation aimed for façade and roofing solutions. To be low cost and systemic, we decided to streamline the value chain through prefabricated modular configurations supported decision support system and tool that enable customised production, industrial scale-up, and efficient construction processes adapted to component manufacturers, integrators, installers and contractors. As such, costs in the whole life cycle are decreased: due to easy installation to simple maintenance (pipes on façades are easily accessible from outside), arriving to affordable decommissioning and finally to convenient recycling. Embodied energy is considered. To be attractive beyond affordability, we aim at multifunctional semi-prefabrication which provides an opportunity to retrofit improving aesthetics, comfort, energy performance, and property value at the same time.

Efficient construction processes involve low impact on occupants and lower risk to investors. We are indeed combining the challenge of developing an innovative solution for systemic retrofitting while coping with the pragmatic aspects of construction (corners, connections, thermal bridges, etc.) In order to overcome current barriers for retrofitting, social, technological, industrial, and economic barriers are deliberately treated through the identification of bottlenecks, impediments, and human factors preventing positive retrofit decisions and then by providing the means to overcome them. The result is the RetroKit Toolbox composed of modular solutions and high quality decision support tools that provide information, performance estimates, financial transparency, and design support.

To achieve all of these objectives, our consortium is driven by DRA, the Top 1 European construction company as part of the ACS Group operating world-wide in more than 40 countries, BLATRADEN a highly innovative SME company with long standing experience in prefabrication, STO a technical leader for insulation systems as well as AMS, a research intensive construction SME which has pioneered innovative coatings and plasters to minimise thermal bridges and microbial growth on walls, partitions and air ducts. The project ideas are based on feasibility work performed by FHG, SP, SINTEF and TECNALIA within a joint research programme funded with own resources, which deeply investigated the concept of prefabricated façade systems within the AERTOS ERA-Net framework.

In WP1 (Societal beneficial systemic retrofit) the partners investigate and identified through means of web survey and questionnaires objections, bottlenecks, and impediments that prevent positive retrofit decisions and the conditions, requirements, information, arguments and human factor aspects for the retrofit toolbox in order to be perceived as an attractive solution from the point of view of residents and of decision makers of the construction process (including architects, engineers, builders, authorities, housing owners). Monitoring and analysis of the results demonstrates the effects of the solutions on the inhabitants.

WP2 (Multifunctional and modular retrofitting components and technologies) is a cornerstone of the project and it is dedicated to the development of multifunctional façade retrofitting solutions such as insulation components with integrated air ducts, and multifunctional energy producing façade elements and integrated energy use systems. These new components and systems (with others) have been characterised and tested in lab environment. The WP contains the scientific and technical development of materials and components that form the basis of the prefabricated modules.

WP4 (Effective retrofitting process) integrates the experiences and expertise (mainly) of the consortium retrofitters. The workpackage achieved a study of the construction retrofitting processes in a holistic way and how these processes can be optimised. Then, the optimised construction retrofitting processes that minimise intrusion, maximise work to the exterior and cavities of the building, reduce the time and cost of retrofitting, and increase safety was developed. WP3 (RetroKit Toolbox) is another cornerstone of the project. This workpackage is integrating information provided from WP2 (technologies) and WP4 (processes) to achieve a real toolbox of solutions, supported by a software enabling decision for retrofitting options. Definition of the toolbox has been achieved as well as integration and the decision support system and tools.

WP5 (Market replication) identified possible users, barriers and markets for the Retrokit toolbox. Optimal market and marketing strategies have been coupled with an effective route for exploitation of RetroKit Toolbox. LCA and LCC analyses are terminated, showing the potential benefits of the solutions adopted.

Demonstration activities are described in WP6 (Pilot cases and Demonstration). EMVS provided a large scale building (social housing) for retrofit in Madrid, Spain. ABGNova proposed a German demonstration building in Frankfurt, which renovation is ongoing. The third Demo building is located in Sweden, provided by Blattraden. These case-studies allow for the verification and refinement of the entire RetroKit methodology, several selected developed technological solutions, and the appropriate construction processes.

Testing facilities, which offer state of the art environment control and monitoring capabilities and the ability to integrate and test all RetroKit technical solutions, have been exploited: Fraunhofer facility tested roofs-PV integrated, TECNALIA facility is hosting the desiccant module under development, while SINTEF facility tested a new type of windows integrating PV on glazing.

WP7 (Exploitation, dissemination and stakeholders engagement) was very active as it is demonstrated by the large number of dissemination events sustained by the project. Architectural competition among student has been defined with positive results. Exploitation activities led to the definition of 8 Key exploitable results, for which a future path has been drafted.

Lastly, WP8 (Project management) ensured the professional conduct and execution of all project activities. Technical progress and active management of workpackage interdependencies is not business as usual in RetroKit due to the complexity of the challenge at hand, holistic nature of the work to be conducted, and the diverse nature of the consortium.

Description of main S & T results/foregrounds

The multifunctional framing elements – KER #1 – are developed to optimize the integration between the air exchange system and new windows. The new window is equipped with a technical box to improve the air quality and energy saving within the interior environment. The purpose of such element is to exchange heat with the exterior air.

The system has been demonstrated and validated in a relevant and operating environment and its TRL is currently 6 – 7.

Knowledge is jointly owned by BGTEC, Fraunhofer, Kokotas.

The partners recognize the potential for applying for a patent on the topic. Still no actions or decision have been made in practical terms, however the innovation is hidden in the products installed so far, therefore the industrial secrecy is preserved.

BGTEC, together with Kokotas will be the producer of the parts. BGTEC will be as well the integrator and the installer of the solution.

Marketing activities will be dedicated to selected arrays of customers, requiring compact and effective solutions.

The business potentially generated is wide, as it can grow in accordance to BGTEC own plans of development.

Regarding the KER #2a, named Prefabricated Insulation panel – Fresh Air Wall (FAW), its development is completed (TRL 7) and the solution can be installed in 1-2 storey buildings. Targeted customers have been mainly identified with housing companies and building owners.

For the general technical approval, the compliance for the fire protection is still necessary, plus large fire tests should be done.

Fraunhofer is the responsible partner for such result, supported by external partners.

Also for the KER #2b – Multifunctional Insulation board - the development has been completed (TRL 7) and the manufacturing is based on usage of mineral wool and steel ducts. There are no problems with fire protection but the solution will be more expensive than the previous one. The general technical approval is still necessary for the production in EPS and plastic ducts. Also for KER #2b customers addressed will be housing companies and building owners.

The responsible partner is STO, supported by Fraunhofer

The KER #2c – ETICS and paintings – is instead already available in the market (TRL 9)

Concerning solutions #2a and #2b, significant business opportunities exist in the market and potential customers are widespread (1% average rate of building retrofitting per year in Europe). However, the real market penetration is related to the compliance with fire regulation.

Agreement between STO and Fraunhofer should be developed concerning solution #2b.

Market potential is high, and the role of STO can grant an easy access to wide networks.

The KER #4 consists on an integrated façade element including a solar thermal collector and a desiccant module, aimed to provide dry air as an initial step for evaporative cooling systems. The system can be integrated with central air handling units and other HVAC modules, plus its

installation is suitable in sun-exposed façades (unobstructed south facing façades).

Currently, development of the KER #4 has achieved a TRL 4: the planned level of 5 has not been reached yet due to the need of re-designing the solution.

The responsible partner of such result is Tecnalia and the initial exploitation strategy foresees the following points:

- (in)Direct involvement in initial experiences
- Need for business development/interaction at building design level (engineering/architecture firms)
- Licensing to third parties: façade manufacturers, lightweight façades, curtain wall systems, etc. (e.g. ASTRAWALL, SCHUCO).

The exploitation of KER #4 aims to address several markets and sectors which can be divided as follows:

- HVAC
 - o Pre-existing buildings with centralised HVAC systems
 - o HVAC system installed in roof area
- Climate
 - o South Europe (or buildings with high cooling loads)
 - o Need for sun exposed south wall
- Building
 - o Integration with curtain wall sections
 - o Overcladding/ façade insulation

The KER #5 provides the following innovative aspects:

- New formulations of nanoparticle's families
- New “industrialized” (on spot) methods to evaluate their:
 - o Optical properties
 - o Physical properties
 - o Special properties
- Development of a pilot plant producing at semi-industrial scale high performance coatings with advanced fully automated “pre – industrial” methods

The new formulations developed have shown improved properties, such as:

1. IR reflectance – IR absorbance
2. Improve substrate's porosity
3. Water penetration resistance
4. Hydrophobicity or hydrophilicity
5. Low thermal conductivity
6. Algae growth resistance
7. Anti-bacterial behavior
8. Self – cleaning behavior
9. Acoustic insulation

Initial exploitation strategy for such result foresees the following points:

- AMS's research results have been exploited for other EU financed project (e.g. CommONEnergy) and used as precursors for further research and development of new innovative multifunctional coatings.
- The results have been presented to clients and partners from the construction industry. The incoming experience resulted from the research was especially useful in order to suggest them innovative retrofitting solutions.
- AMS participated at the fair DesignLab, which took place in Athens last May. Main objective of AMS's participation was focused on “Innovative Materials in the building sector”. During the fair, results of RetroKit project about new innovative materials have been presented: the audience was enthusiastic with the results based on nanotechnology and interested in the benefits from the use of the innovative materials compared with their cost.
- Several scientific presentations took place from AMS's scientific staff, giving the opportunity for the exchange of views with academic and research partners and collaborators (National Technical University of Athens, National Center for Scientific Research “Demokritos”).

The potential markets and customers addressed by KER #5 are:

- Professionals of the construction industry (wholesale)
 - o Technical-Construction Companies for energy efficiency of buildings
 - o Architects & Designers
 - o Civil Engineers

Free distribution for testing and fairs is envisaged.

- Consumers (retail sale)

- o Paint shops

- o E-shops

Targeted advertising strategy will be developed above all for the retail sale.

The KER #6 provides the following innovative aspects:

- ICT instrument, and correlated manual (the Tool) that comprises the decision support tool, the methodology and the results of the experience, oriented to ease the best available solutions in response to the actual building refurbishment needs
- To be made available in the form of a web-based ICT tool, to provide data, transparency on payback, guidelines, and design support, according to the experience and the results gathered within the project.

The tool will need 1-2 years after project conclusion to enter the market. DAPP is the responsible partner but the whole RetroKit Consortium is involved.

Different end customers are foreseen in accordance to the finalities and tools quality:

- Building refurbishment companies
- Architects/designers and planners
- Construction Companies
- Building owners willing to get inside to renovation process

The wide span of customers in Europe, associated to the needs felt for retrofitting, make this tool (and the availability online) an interesting asset.

An initial exploitation strategy foreseen the following pathways (in accordance to the customer type) to exploit the tool:

1. Free use of the SW to promote the RetroKit results through an advertising-based model where revenues come from the fees advertisers pay for the access. Money received from advertisers' fees could help covering costs for hosting and maintaining the website on a commercial server.
2. Freemium proposition for service access to the tool where software is provided free of charge to a large group of users (base version) and revenues come from additional and upgraded features sold to a smaller fraction of the user base (comprehensive version).
3. Pay professional access (annual license fee) through a subscription-based model where users pay a periodic fee (likely annual) for the right to use the software, according to the terms of the agreement signed. Maintenance and support are bundled in the periodic fee and customers get access to the latest versions without having to pay additional upgrade costs.
4. Prefab manufacturers can pay a periodic fee (likely annual) for the right to be listed in the software, according to the terms of the agreement signed.
5. Re-selling of the licenses: the prefab manufacturers pay a big license cost in order to provide customers/partners with the SW free/at lower price.
6. Distribution system: partners can use the normal license to show potential customers how it works and they will receive a fee for every customer acquired.

Finally, the strategy agreed among the partners is drafted in accordance to the following:

- DAPP is the SW owner and is in charge to complete, maintain and upgrade the SW (proprietary code) from the programming and hosting sides
- Project partners (PP) are in charge to update the solutions database and to test the tool
- DAPP and PP can use the SW for free for internal projects
- PP will pay a fee to DAPP when using the SW for commercial purposes under a contract (e.g. customer support)
- Customers that want/need an account will pay the license costs to DAPP
- PP will receive a fee if they provide customer willing to pay license

Three levels of access are planned:

- DAPP: administrator
- PP: power user
- Customer: user

Money coming from the fees will be used to maintain and keep active the SW. About this, partners agreed on the fact that the system is based on trust, hence if nobody pays the fee, the system cannot be maintained.

The RetroKit Methodology (KER #7) will be exploited as a commercial product addressing companies involved in retrofitting apartment buildings.

At project completion such result will reach TRL 9.

In particular, two companies are already interested in exploiting the RetroKit Methodology and they are:

- DWecoCo: a sustainable design company with architects
- Dragados: a large construction company

DWecoCo has identified the following market opportunities in Ireland:

- 140,000 apartments in Ireland, about 10% of total dwellings
- Assuming 1% retrofitting rate then 1,400 apts retrofitted pa
- Assume €10,000 deep retrofit cost per apt = €14 M pa
- Consultancy service @ 2% = €280,000 pa income

Dragados found market opportunities in Spain as follows:

- 17 M apartment in Spain
- Assuming 1% retrofitting rate then 170,000 apts retrofitted pa
- Assume €10,000 deep retrofit cost per apt = €1.7 B pa
- 5% of market share for Dragados = € 85 M

DRAGADOS is the exploitable responsible partner for such result, while SP and BLATRADEN are the main contributors. Anyhow, the whole consortium is involved.

Concerning KER#8, partners SEGEL and D'APPOLONIA have both contributed in the work with business modelling as part of the RetroKit project. Both companies may freely exploit the results in any country. The Business Models will be built according to specifics of customers and sectors targeted.

Potential impact and main dissemination activities and exploitation results

RetroKit provides an holistic and systemic approach for the retrofitting of residential multi-storey buildings allowing them to achieve the energy efficiency levels of new buildings.

Holistic because it addresses the whole value chains and components, from decision making to construction processes, from windows to integration of renewable energy systems, from assessment metrics to business models.

Systemic because the approach aligns the stakeholders through the retrofit phases of building assessment, solution design, industrial scale up of developed technologies (manufacturing), and on-site construction processes.

RetroKit aim to meet the call targets of 50 kWh/m²/year, the reduction of peak loads, and a reduction of 30% energy consumption with respect to new building standards by developing new retrofitting systems based on prefabricated elements has been almost achieved. Last post project refinements consist in an industrialization of some of the technologies developed and the mass production will reduce the current prototype production costs.

A payback close to 7 years was made possible through the project approach to develop prefabricated multifunctional retrofitting solutions. Business models accounts for benefits not only directly related to energy saving but also on the avoided impact of the traditional retrofitting systems and tool, not used in RetroKit due to the technologies prefabrication.

Benefits can be seen at different levels:

- at macro-level, by inducing important savings in terms of energy consumption and emissions and by increasing turnover for the benefit of the almost 3 million construction SMEs operating in building renovation with a consequent impact on job creation;
- as buying drivers for the apartment/building owners, as they can have clear economic savings in the energy bills and more attractive higher value properties, while at the same time avoiding the discomforts and burden often associated to retrofitting intervention;
- for the actors involved in the retrofitting supply chain, as new skills and profiles will be required, and new business opportunities can be generated.

RetroKit target is the 10 million multi-family residential buildings built from 1945 to 1980, which are supposed to require a general maintenance and refurbishment and where energy-efficiency measures could provide added value at a reasonable extra cost.

Starting from the difference in thermal transmittance before and after retrofitting intervention and the heating degrees hours for the building location, assumed in central Europe, the total energy saving that can be obtained with intervention on the envelope only is about 4,2 billions kWh per year if the new retrofitting solution is applied in 5% of the target buildings, leading to almost 1 Mton of CO₂ saved.

Considering an average energy cost of 0,12 €/kWh²⁷ between 2010 and 2030, this energy savings corresponds to an overall saving of about 500 M€, considering the expected market penetration of 5%.

RetroKit followed approach will result also in an increase of turnover for the whole European construction sector, through new investments which couple structural retrofitting to energy efficient solutions. Assuming that a standard intervention with the RetroKit approach over the whole building combines the solution for the outer envelope, the total investment costs (including installation) can be estimated as 120 €/m² in total. With these numbers and assuming again a penetration rate of 5% within 5 years after the end of the project, this will result in an increase of turnover and additional investments for the construction sector of almost 4 billion €.

This market share will have a positive impact also on job creation as it includes effects on the volume of construction works, effects on the volume of jobs related to the components manufacturing and to the façade assessment and many others. The additional investments can be compared to the turnover and employment of the construction industry, where 14,9 million operatives generate a total turnover of 1173 billion €²⁸, corresponding to a turnover of 78 k€/y per employee. It can be assumed that the share of material costs for the proposed retrofitting process is a factor of 2 higher than conventional construction activities.

Thus, an additional 150 k€/y invested into energy-savings packages would generate one new position. Therefore additional investments of 4 Billion € would roughly correspond to 27000 additional new jobs in the construction and installation industries across Europe.

To get continuous feed-back from the market and other stakeholders, it is of great importance to disseminate public results from the project. The project partners in RetroKit have disseminated actively on a national, as well as international, level.

A number of 101 separate dissemination activities have been carried out within the project since the project started in September 2012.

The RetroKit partners has mostly made oral presentations of the project at both scientific events as well as to wider publics. The project has also mainly been included in newsletters and at the project partner's websites. In addition to that RetroKit Newsletters has been issued and sent to almost 1000 contacts and afterward published on the project website.

The RetroKit project partners have arranged and participated at seminars on national as well as international level.

Among many others, the partners have disseminated RetroKit at:

- BAU 2013 and 2015 in Munich, Germany;
- The 35th AIVC Conference in Poznań, Poland;
- Clima 2013 in Prague, Czech Republic;
- The project has also been presented in a PhD Course at Luleå University of Technology in Sweden;
- ABGNova has a permanent exhibition about RetroKit at Sophienhof, in Frankfurt.

At a national level the project partners have arranged and participated at 8 seminars with national stakeholders.

Finally a design contest for architect students was set up. The main objective was to involve and engage young architects in the innovative and energy efficient RetroKit concept, hence a design contest for architect students was run autumn semester 2015 and spring semester 2016. The contest was developed by DWecoCo and EMVS, with support from SP.

The competition was made as a student task in a course at the universities in Alcalá de Henares and Dublin, and was in that way not an open competition.

All students' projects can be viewed in a book at the website:

http://www.retrokitproject.eu/wp-content/uploads/2016/06/RetroKit-Design-Project__Compressed.pdf

DWecoCo introduced the design project to the students in the Masters in Sustainable Design programme with the RetroKit project as a source of information. Through a combination of seminars on retrofitting and the sustainable design of buildings and design workshops focused on design concepts and solutions for a selected apartment building in Dublin.

The building in Dublin; Glovers Court, is of a similar type to the focus of the RetroKit project. Plans of the building were made available to the students in a CAD format so that they could focus their efforts on the design of suitable retrofit solutions using the RetroKit Toolbox.

Ten students completed the project with various innovative ideas for the building in Dublin, with focus on energy efficiency and attractive design for the residents.

EMVS introduced the RetroKit project as a source of information, to university students at the 4th Year course on Innovation & Sustainability, at the School of Architecture at Alcalá de Henares

University. The students developed their projects while going through a combination of seminars on retrofitting and the sustainable design of buildings and design workshops focused on sustainable and bioclimatic design concepts and solutions.

18 students from different countries, grouped in eight different teams completed the project with various innovative ideas for the buildings in Spain & Greece, with focus on energy efficiency and sustainability.

In a first phase, each group chose an existing building, analyzed climate and performance and proposed a retrofitting solution, based on RetroKit developments. The second part consisted of designing a new build small industrialized extension with RetroKit products as well.

The definitive updated list of Key Exploitable Results (KERs) and their characterization were agreed among partners during the exploitation strategy seminars and following updates occurring along the course of the entire project.

Eight Key Exploitable Results has been identified, 6 related to products, 2 related to services:

- 1 Multifunctional framing elements (BGTEC);
- 2 Integrated façade elements (FHG) – This KER is split in three sub-KER;
- 3 Envelope integrated solar thermal and PV (STO);
- 4 Renewable prefabricated cooling systems (TECNALIA);
- 5 Novel high reflectance and/or insulating coatings (AMS);
- 6 Decision Support System (DAPP);
- 7 RetroKit retrofitting methodology (DRA);
- 8 RetroKit business model (SEGEL).

For each of the KERs the following analyses have been performed. First of all a characterization of the result is provided with all the necessary information to describe and contextualize the KER, then a PESTLE Assessment has been performed which collect the impact on and influences of the external factors. Then a simple Business Model has been drafted to evaluate the impact of the internal factors influencing the exploitation strategy and the potential commercial path.

An Evaluation of the possible risks is performed as well, together with an analysis of the patents and publications landscape, in order to allow partners to understand the potential room for patenting and to identify the competitors and similar solutions.

Finally an Exploitation route is provided, encompassing the role of the partners into the exploitation of the result, their exploitation claims and future activities to be done to completely achieve the necessary conditions to enter the market.

Address of project public website and relevant contact details

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4.2 Use and dissemination of foreground

Section A (public)

Publications

LIST OF SCIENTIFIC PUBLICATIONS, STARTING WITH THE MOST IMPORTANT ONES										
No.	Title / DOI	Main author	Title of the periodical or the series	Number, date or frequency	Publisher	Place of publication	Date of publication	Relevant pages	Is open access provided to this publication ?	Type
1	Energy performance of façade integrated decentralised ventilation systems 10.1016/j.enbuid.2015.08.015	Fabien Coydon , Sebastian Herkel , Tejas Kuber , Jens Pfafferott , Sascha Himmelsbach	Energy and Buildings	Vol. 107	Elsevier BV	Netherlands	01/11/2015	172-180	No	Peer reviewed
2	Monitoring results and optimization of a façade integrated ventilation concept for building retrofit	Coydon, FabienDuran, MaximeDinkel, ArnulfHerkel, Sebastian	International Journal of Ventilation	14/4	Veetech Ltd.		30/03/2016	http://www.tandfonline.com	No	Peer reviewed
	Monitoring results and optimization of a façade integrated ventilation concept for building retrofit	Coydon, FabienDuran, MaximeDinkel, ArnulfHerkel, Sebastian	35th AIVC Conference		AIVC, Air infiltration and Ventilation Centre	Poznan (Poland)	24/09/2014	http://aivc2014conference.org/	Yes	Conference
	Air renewal effectiveness of decentralized ventilation devices with heat recovery	Coydon, FabienPfafferott, Jens	35th AIVC Conference		AIVC, Air infiltration and Ventilation Centre	Poznan (Poland)	24/09/2014	http://aivc2014conference.org/	Yes	Conference
	Assessment of a photovoltaic thermal (PV T) prefabricated façade	Angelina Katsifaraki, Bru	24th Symposium Thermische Solarenergie		Fraunhofer	Bad Staffelstein	07/05/2014		Yes	Conference

		no Bueno, Tilmann E. Kuhn, Christoph Maurer								
	Retrofitting with prefabricated modules. Stakeholders' views and needs.	Kleiven, Tommy; Woods, Ruth; Risholt, Birgit Dagrun.	World Sustainable Building Conference 2014, Barcelona		ICONDA@CIBLibrary	Rotterdam	28/10/2014		Yes	Conference
	Evaluating the consequences of retrofitting residential multi-family buildings on indoor environmental quality, comfort, health and user satisfaction	Y. de Kluizenaar P. de Jong, E. Cornelissen, M van Vliet	Healthy Buildings 2015, Eindhoven, The Netherlands		Healthy Buildings 2015		16/01/2015			Conference
	Retrofitting multifamily buildings with prefabricated modules – RETROKIT : Stakeholder needs and views.	Kleiven, Tommy; Woods, Ruth; Risholt, Birgit Dagrun.	SINTEF Fag Rapport 21	21	SINTEF Academic Press	Oslo	30/10/2014		Yes	Monogram

LIST OF DISSEMINATION ACTIVITIES								
No.	Type of activities	Main Leader	Title	Date	Place	Type of audience	Size of audience	Countries addressed
1	Press releases	EMPRESA MUNICIPAL DE LA VIVIENDA Y SUELO DE MADRID SA	Expertos europeos participan en la Rehabilitación de Ciudad de los Ángeles	10/01/2012	http://www.emvs.es/Comunicacion/Notas/2012/ExpertosEUCAngelés1001/Paginas/inicio.aspx	Civil society - Medias		Spain
2	Articles published in the popular press	EMPRESA MUNICIPAL DE LA VIVIENDA Y SUELO DE MADRID SA	Madrid colabora en proyecto europeo de rehabilitación sostenible de edificios	01/10/2012	ABC	Civil society - Medias		Spain
3	Web sites/Applications	INSTITUTUL DE CERCETARI ELECTROTEHNICE	Newsletter start RetroKit project	01/10/2012	http://www.icpe.ro/files/0/Icpe_parterner_retrokit.pdf	Scientific community (higher education, Research) - Industry - Civil society - Medias	300	Romania
4	Web sites/Applications	SP SVERIGES TEKNISKA FORSKNINGENS INSTITUT AB	RetroKit Newsletter no 1	20/12/2012	http://www.bwz.se/sp/b.aspx?l=246C0AC2-30FF-4796-BC29-FAD9A2FCDB51&r=112943&rcrc=3C13CD30	Scientific community (higher education, Research) - Industry - Policy makers - Medias	1600	All countries in the consortium
5	Web sites/Applications	STIFTELSEN SINTEF	Utvikler løsninger for energieffektiv rehabilitering	14/01/2013	http://www.sintef.no/Byggforsk/Nyheter/Utvikler-losninger-for-energieffektiv-rehabilitering/	Scientific community (higher education, Research)		Norway
6	Articles published in the popular press	STIFTELSEN SINTEF	Høyt energifokus på lavblokker	15/01/2013	http://www.vvsaktuelt.no/xp/pub/hovedmeny/varme_og_energi/619671	Industry		Norway
7	Exhibitions	FRAUNHOFER-GESELLSCHAFT ZUR FÖRDERUNG DER AN	Minimalinvasiver Sanierungsprozess durch vore fertige Fassaden module	14/01/2013	BAU 2013, Munich	Scientific community (higher education, Research) - Industry - Policy	10000	Worldwide

		GEWANDTEN FORSCHUNG E.V				makers		
8	Web sites/Applications	INSTITUTUL DE CERCETARI ELECTROTEHNICE	Information about Retrokit project(background)	01/02/2013	Yahoo groups - (specialists)	Scientific community (higher education, Research) - Industry - Policy makers	600	Romania
9	Organisation of Workshops	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Building Renovation - New Methods using Prefabricated Elements	19/02/2013	Armersfoort, Netherlands	Industry - Policy makers	60	The Netherlands
10	Web sites/Applications	SP SVERIGES TEKNISKA FORSKNINGENS INSTITUT AB	RetroKit Newsletter no2	21/02/2013	http://www.bwz.se/sp/b.aspx?l=ba7e01ca-7179-4315-afb-9c104d99fd7e&r=112943&rcrc=3C13CD30	Scientific community (higher education, Research) - Industry - Policy makers - Medias		All countries in the consortium
11	Web sites/Applications	INSTITUTUL DE CERCETARI ELECTROTEHNICE	Newsletter 6 Month Meeting „Retrokit - Toolboxes for systemic retrofitting”	03/03/2013	http://www.icpe.ro/ro/p/retrokit_toolboxes_ro	Scientific community (higher education, Research) - Industry - Policy makers - Medias		Romania
12	Oral presentation to a wider public	EMPRESA MUNICIPAL DE LA VIVIENDA Y SUELO DE MADRID SA	? Ejemplos de promociones e intervenciones con criterios de Sostenibilidad de la EMVS	13/03/2013	? Buenas Prácticas (Ayuntamiento de Madrid)	Policy makers	100	Spain
13	Oral presentation to a wider public	EMPRESA MUNICIPAL DE LA VIVIENDA Y SUELO DE MADRID SA	La I+D en edificación/Experiencias de la EMVS	22/03/2013	CONCLIMAT (Pamplona)	Industry	150	Spain
14	Web sites/Applications	STIFTELSEN SINTEF	Questionnaire survey on retrofitting, RETROKIT	01/03/2013	Home pages of industry and interest organisations	Industry		All countries in the consortium
15	Web sites/Applications	STIFTELSEN SINTEF	Direct e-mail: RetroKit survey	01/04/2013	? Direct e-mail approach with information of the RetroKit project (link to project websi	Industry	5500	All countries in the consortium + Switzerland

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16	Articles published in the popular press	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Annual building physics book	01/04/2013	Minimalinvasive Sanierung mit vorgefertigten, multifunktionalen Fassadenmodulen	Scientific community (higher education, Research) - Industry		Germany
17	Flyers	INSTITUTUL DE CERCETARI ELECTROTEHNICE	Flyer: RetroKit background	04/04/2013	Bucarest (Conference : Thermal Rehabilitation)	Scientific community (higher education, Research) - Industry - Policy makers - Medias	50	Romania
18	Organisation of Workshops	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Energetische Sanierung von Wohngebäuden mit vorgefertigten multifunktionalen Systemen	11/04/2013	Holzkirchen, Germany	Scientific community (higher education, Research) - Industry	50	Germany
19	Oral presentation to a scientific event	EMPRESA MUNICIPAL DE LA VIVIENDA Y SUELO DE MADRID SA	Experiencias en Sostenibilidad de la EMVS	24/04/2013	UAH	Scientific community (higher education, Research)	80	Spain
20	Oral presentation to a scientific event	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Innovative façade refurbishment with integrated air ducting for the existing building stock	24/04/2013	Building Physics Conference, Munich	Scientific community (higher education, Research) - Industry	100	Europe
21	Oral presentation to a scientific event	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Building Retrofit with Multifunctional and Prefabricated Window Elements	26/04/2013	Building Physics Conference, Munich	Scientific community (higher education, Research) - Industry	100	Europe
22	Oral presentation to a scientific event	EMPRESA MUNICIPAL DE LA VIVIENDA Y SUELO DE MADRID SA	Experiencias en Sostenibilidad de la EMVS	01/05/2013	EUATM-UPM	Scientific community (higher education, Research)	100	Spain
23	Web sites/Applications	INSTITUTUL DE CERCETARI ELECTROTEHNICE	Website for Retrokit project- ICPE	01/06/2013	http://www.icpe.ro/retrokit/	Scientific community (higher education, Research)		Romania

		LECTROTEHNICE				ion, Research) - Industry - Policy makers - Medias		
24	Oral presentation to a scientific event	FRAUNHOFER -GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Rapid Retrofit Solutions Integrating HVAC into Prefabricated EWIS Systems	17/06/2013	Prague – Climate 2013	Scientific community (higher education, Research) - Industry	60	Worldwide
25	Oral presentation to a wider public	EMPRESA MUNICIPAL DE LA VIVIENDA Y SUELO DE MADRID SA	xperiencias en Ahorro energético en Proyectos de la EMVS	26/06/2013	Instituto de Formación y Estudios del Gobierno Local (Ayto. De Madrid)	Civil society - Policy makers	80	Spain
26	Oral presentation to a scientific event	FRAUNHOFER -GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Innovative façade refurbishment with integrated air ducting for the existing building stock	28/06/2013	CESB13 Conference Prague	Scientific community (higher education, Research) - Industry	100	Europe
27	Flyers	INSTITUTUL DE CERCETARE LECTROTEHNICE	Flyers, networking	03/10/2013	Bucarest : Conference Restaurare, Renovare, Reabilitare	Scientific community (higher education, Research) - Industry - Policy makers		Romania
28	Oral presentation to a scientific event	FRAUNHOFER -GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Building Retrofit with Multifunctional and Prefabricated Window Elements	06/11/2013	Advanced Building Skins conference, Bressone	Scientific community (higher education, Research) - Industry	100	Europe
29	Organisation of Conference	FRAUNHOFER -GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Fachtagung der Fraunhofer Allianz Bau „LUFT als Qualitätsfaktor für Gebäude“ Fassadenintegrierte Lüftung für die Gebäudesanierung	20/11/2013	Munich	Industry	80	Germany
30	Web sites/Applications	EMPRESA MUNICIPAL DE LA VIVIENDA Y SUELO DE MADRID SA	International research project (Link to Retrokit at EMVS website `new innovation section´	01/12/2013	Website of EMVS: http://www.emvs.es/Innovacion/Paginas/RETROKIT.aspx	Scientific community (higher education, Research) - Industry - Civil society - Policy makers -		Spain

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31	Articles published in the popular press	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Minimalinvasives Sanierungssystem mit vorgefertigtem, multifunktionalem WDVS-Fassade nmodul	01/12/2013	Journal	Industry - Civil society		Germany
32	Organisation of Workshops	PROIGMENES EREVNITIKES & DIAHIRISTIKES E FARMOGES	Retrofitting and Saving	15/02/2014	Horeca, Thessaloniki Greece	Industry	25	International
33	Organisation of Workshops	PROIGMENES EREVNITIKES & DIAHIRISTIKES E FARMOGES	Enhancing Energy Efficiency – Reducing losses	08/03/2014	Climatherm exhibition 2014, Athens, Greece	Industry	50	International
34	Organisation of Workshops	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Innovative Fassadendämmung mit integrierter Lüftung	25/09/2014	inHaus, Duisburg	Scientific community (higher education, Research) - Industry - Civil society	25	Germany
35	Articles published in the popular press	KOKOTAS KLIMATISMOS EPE	## ##μμ##### #λ λη##### ## η #ημ####γ## #####μ#### ## μ###η# ## #η# ##	06/11/2012	http://www.tovima.gr/finance/article/?aid=482592&wordsinarticle=RETROKIT	Civil society - Medias		Greece
36	Web sites/Applications	KOKOTAS KLIMATISMOS EPE	#λλη#### ##μμ##### ## ##### ## γ##μμ# "RETROKIT"	15/11/2012	http://www.buildnet.gr/default.asp?pid=235&la=1&catid=203&artid=6505	Scientific community (higher education, Research)		Greece
37	Web sites/Applications	KOKOTAS KLIMATISMOS EPE	#λλη#### ##μμ## ### ## #####η##### ###γ##μμ#	07/11/2012	http://www.capital.gr/Articles.asp?id=1659875	Civil society		Greece
38	Articles published in the popular press	KOKOTAS KLIMATISMOS EPE	#λλη#### ##μμ## ### ## #####η##### ###γ##μμ#	15/11/2012	http://www.ili-ktirio.gr/735FCDBA.e1.aspx	Scientific community (higher education, Research)		Greece
39	Web sites/Applications	KOKOTAS KLIMATISMOS EPE	Information on KOKOTAS website	10/10/2012	http://eshop.kokotas.gr/News/d	Industry - Civil society		Greece

					eltio-tipou-retrokit -project.html			
40	Oral presentation to a wider public	STIFTELSEN SINTEF	Bruk av "smarte" tre elementer til rehabilitering av fasader (Use of smart wood elements for facade renovation)	27/11/2013	Oslo	Industry	100	Norway
41	Oral presentation to a wider public	STIFTELSEN SINTEF	Solfanger integrert i NorDan vindu (Solar collector integrated in a Nordan window)	04/09/2014	Oslo	Scientific community (higher education, Research) - Industry	180	Norway
42	Oral presentation to a scientific event	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Assessment of a photovoltaic thermal (PVT) prefabricated façade	07/05/2014	Bad Staffelstein	Scientific community (higher education, Research) - Industry	30	Germany, Austria, Switzerland
43	Oral presentation to a wider public	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Technische Möglichkeiten minimalinvasiver Sanierungstechniken – multifunktionale Konzeptansätze durch vorgefertigte Bauteile	08/05/2014	Gesellschaft für rationale Energieverwendung e.V., Kassel	Scientific community (higher education, Research) - Industry - Civil society	100	Germany
44	Oral presentation to a scientific event	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Innovative façade refurbishment with integrated air ducting for the existing building stock	17/06/2014	Conference Nordic Symposium on Building Physics NSB 2014, University of Lund; Sweden	Scientific community (higher education, Research)	400	Sweden, international
45	Oral presentation to a wider public	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Innovative Fassadendämmung mit integrierter Lüftung	25/09/2014	Fraunhofer inHaus, Duisburg	Scientific community (higher education, Research) - Industry - Civil society	25	Germany
46	Posters	ABGNOVA GMBH	RetroKit: Energetische Gebäudesanierung	27/03/2014	ABGnova. Continuously shown 2 times/month.	Industry	60	Germany
47	Web sites/Applications	SP SVERIGES TEK	RetroKit Newsletter	06/10/2014	http://www.bwz .	Scientific community	1630	All countries in the

	cations	NISKA FORSKNINGSINSTITUT AB	no 4		se/sp/b.aspx?l=bfd9cfac-5864-442a-a1c0-35f571d623f6&r=164879&rsrc=32981345	unity (higher education, Research) - Industry - Civil society - Policy makers - Medias		consortium
48	Web sites/Applications	SP SVERIGES TEK NISKA FORSKNINGSINSTITUT AB	RetroKit Newsletter no 3	16/12/2013	http://www.bwz.se/sp/b.aspx?l=7ecb0a1f-3985-43d8-ac1f-c76cec57ed09&r=115358&rsrc=F4A59072	Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias	1600	all countries in the consortium
49	Exhibitions	D'APPOLONIA SPA	Smart Energy Expo	10/10/2014	Verona	Industry	9000	Europe
50	Oral presentation to a wider public	D'APPOLONIA SPA	RetroKit - toolboxes for systemic retrofitting	07/11/2014	Milan	Industry		Italy
51	Flyers	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Multifunktionale Fassaden-elemente für Sanierungen	16/01/2015	Germany	Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias		German speaking countries
52	Exhibitions	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Messe Bau (Fraunhofer Stand with Retrokit prototype at international exhibition of the whole building sector)	19/01/2015	Munich, Germany	Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias		All countries represented at BAU
53	Web sites/Applications	INSTITUTUL DE CERCETARI ELECTROTEHNICE	Up date webpage ICPE for Retrokit project	30/11/2014	www.icpe.ro/retrokit	Scientific community (higher education, Research) - Industry - Policy makers		Romania
54	Oral presentation to a wider public	INSTITUTUL DE CERCETARI ELECTROTEHNICE	ICPE- partner in Retrokit project	15/10/2014	Bucharest International Technical Fair - TIB 2014, Romania	Scientific community (higher education, Research) - Industry - Policy makers	50	Romania
55	Oral presentation to a scientific event	INSTITUTUL DE CERCETARI ELECTROTEHNICE	ICPE activities regarding monitoring and control systems in Retrokit project	28/10/2014	Workshop : "New consortium for R&D projects", Bucarest, show	Scientific community (higher education, Research)	50	Romania

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56	Oral presentation to a wider public	ABGNOVA GMBH	European Researchproject "RetroKit" Gebäudesanierung mit vorgefertigten Bauteilen	02/12/2014	Frankfurt am Main	Industry	50	Germany
57	Oral presentation to a scientific event	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETEN SCHAPPELIJK ONDERZOEK - TNO	RetroKit	18/05/2015	Healthy Buildings 2015, Eindhoven, The Netherlands	Scientific community (higher education, Research) - Industry		The Netherlands, Europe
58	Exhibitions	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Fraunhofer Stand with Retrokit prototype	16/03/2015	ISH, The Bathroom Experience, Frankfurt	Industry		Germany, Europe
59	Oral presentation to a wider public	BLATRADEN AB	Information Retrokit	08/05/2015	Piteå	Civil society	50	Sweden
60	Articles published in the popular press	BLATRADEN AB	En förutsägbar process är målet för RetroKit	13/05/2015	Svensk Byggtjänst (Journal of Swedish Building Service)	Scientific community (higher education, Research) - Industry		Sweden
61	Oral presentation to a wider public	BLATRADEN AB	BLATRADEN in Europe	22/06/2014	Piteå näringsföretag (Local politicians and local business owners)	Industry - Policy makers	50	Sweden
62	Oral presentation to a scientific event	BLATRADEN AB	New materials and their potential	26/09/2014	PhD Course Lulea university of technology	Scientific community (higher education, Research)	40	Europe
63	Web sites/Applications	SP SVERIGES TEKNISKA FORSKNINGSPERSONALINSTITUT AB	RetroKit newsletter no 5	01/04/2015	http://www.bwz.se/sp/b.aspx?l=a55c83c3-a795-4e5d-8ee5-e3834a04fac6&r=164879&rcrc=32981345	Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias	1630	All countries in the consortium
64	Oral presentation to a wider public	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Fassadenintegrierte Lüftung für die Gebäudesanierung	19/01/2015	Munich, Germany - Messe Bau	Scientific community (higher education, Research) - Industry	100	All

		UNG DER AN GEWANDTEN FORSCHUNG E.V				ustry - Civil society - Policy makers - Medias		
65	Oral presentation to a wider public	FRAUNHOFER -GESELLSCHAFT ZUR FOERDER UNG DER AN GEWANDTEN FORSCHUNG E.V	Fassadenintegrierte Lüftung für die Gebäudesanierung	18/02/2015	Thementag Lüftung - Energieagentur - Freiburg	Industry	100	Germany
66	Oral presentation to a scientific event	FRAUNHOFER -GESELLSCHAFT ZUR FOERDER UNG DER AN GEWANDTEN FORSCHUNG E.V	Air renewal effectiv eness of decentraliz ed ventilation devic es with heat recover y	24/09/2014	Pozna# (Poland) - 35th AIVC Confere nce	Scientific comm unity (higher educat ion, Research) - Ind ustry	50	Worldwide
67	Oral presentation to a scientific event	FRAUNHOFER -GESELLSCHAFT ZUR FOERDER UNG DER AN GEWANDTEN FORSCHUNG E.V	Air renewal effectiv eness of decentraliz ed ventilation devic es with heat recover y	24/09/2014	Pozna# (Poland) - 35th AIVC Confere nce	Scientific comm unity (higher educat ion, Research) - Ind ustry	50	Worldwide
68	Web sites/Appli cations	DRAGADOS SA	Kick-off of the RETROKIT Project	03/12/2012	Research, Devel opment and Inno vation in Constructi on. ACS Group C onstruction Com panies Newsletter. N	Industry	74000	Spain, Germany, UK, Poland, , EEUU, Canada, A ustralia, Chile, Arg entina, Colombia, Perú, Venezuela
69	Web sites/Appli cations	DRAGADOS SA	RETROKIT Project: Windows and techn ical box installation in the demonstration building in Madrid	11/08/2014	Research, Devel opment and Inno vation in Constructi on. ACS Group C onstruction Com panies Newsletter. N	Industry	74000	Spain, Germany, UK, Poland, , EEUU, Canada, A ustralia, Chile, Arg entina, Colombia, Perú, Venezuela
70	Web sites/Appli cations	DRAGADOS SA	Building monitoring in Madrid demo building	15/06/2015	Research, Devel opment and Inno vation in Constructi on. ACS Group C onstruction Com panies Newsletter. N	Industry	74000	Spain, Germany, UK, Poland, , EEUU, Canada, A ustralia, Chile, Arg entina, Colombia, Perú, Venezuela
71	Articles published in	STIFTELSEN SINT	Retrofitting multifa	29/10/2014	SINTEF Academic	Industry	5000	Norway

	the popular press	EF	mily buildings with prefabricated modules ? RETROKIT		Press www.sintefbok.no			
72	Oral presentation to a scientific event	STIFTELSEN SINTEF	Retrofitting with prefabricated modules. Stakeholders views and needs.	29/10/2014	World Sustainable Building Conference, Barcelona	Scientific community (higher education, Research)	200	Global
73	Web sites/Applications	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Minimalinvasive Sanierung mit System	20/11/2015	BINE Informationsdienst (newsletter)	Industry - Civil society - Policy makers - Medias	15000	Germany
74	Articles published in the popular press	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Multifunktionale Fensterelemente	08/11/2015	Energiesparen	Industry - Civil society	15000	Germany
75	Oral presentation to a wider public	SEGEL AS	Frå overordna føringar til lokalt potensial	12/11/2015	Miljøbyggkonferansen 2015	Industry - Policy makers	100	Norway
76	Articles published in the popular press	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	ABG testet Lüftungskanäle in der Wärmedämmung	19/01/2016	http://www.enbausa.de/daemmung-fassade/aktuelles/artikel/abg-testet-lueftungskanaele-in-der-waermeda	Industry - Civil society - Policy makers - Medias		Germany
77	Flyers	INSTITUTUL DE CERCETARI ELECTROTEHNICE	ICPE- partner in Retrokit project	17/10/2015	TIB 2015 International Fair, Romexpo, Bucurest, Romania	Scientific community (higher education, Research) - Industry - Policy makers	100	Romania
78	Oral presentation to a wider public	INSTITUTUL DE CERCETARI ELECTROTEHNICE	ICPE activities regarding monitoring and control systems in Retrokit project	02/10/2015	SWIC & EV2015 conference, Bucurest, showroom ICPE	Scientific community (higher education, Research) - Industry	200	Romania
79	Exhibitions	EMPRESA MUNICIPAL DE LA VIVIENDA Y SUELO DE MADRID SA	Circuito AURhEA	08/05/2014	International Fair "SICRE 2014"	Scientific community (higher education, Research) - Industry - Policy makers	1500	Spain

80	Exhibitions	EMPRESA MUNICIPAL DE LA VIVIENDA Y SUELO DE MADRID SA	Servicio de Ahorro Energético y Rehabilitación (SAER)	29/05/2014	International Fair "SIMA 2014"	Scientific community (higher education, Research) - Industry - Policy makers	1000	Spain
81	Exhibitions	EMPRESA MUNICIPAL DE LA VIVIENDA Y SUELO DE MADRID SA	Comprometidos con la Rehabilitación Sostenible	25/11/2014	International Fair "CONAMA 2014"	Scientific community (higher education, Research) - Industry - Policy makers	7000	Spain
82	Organisation of Workshops	EMPRESA MUNICIPAL DE LA VIVIENDA Y SUELO DE MADRID SA	Ille Eficient, Concursó Multidisciplinari	24/02/2015	Colegio de Arquitectos de Cataluña.	Scientific community (higher education, Research)	200	Spain
83	Exhibitions	EMPRESA MUNICIPAL DE LA VIVIENDA Y SUELO DE MADRID SA	Servicio de Ahorro Energético y Rehabilitación	08/10/2015	International Fair "SIMA 2015"	Scientific community (higher education, Research) - Industry - Policy makers	1300	Spain
84	Exhibitions	EMPRESA MUNICIPAL DE LA VIVIENDA Y SUELO DE MADRID SA	Servicio de Ahorro Energético y Rehabilitación	05/11/2015	International Forum "FORAE 2015"	Scientific community (higher education, Research) - Industry - Policy makers	650	Spain
85	Exhibitions	EMPRESA MUNICIPAL DE LA VIVIENDA Y SUELO DE MADRID SA	Renovate Italy	09/11/2015	International Forum "RIDAY 2015"	Scientific community (higher education, Research) - Industry - Policy makers	650	Spain
86	Oral presentation to a wider public	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Development and Assessment of Novel Semifabricated Facades integrating HVAC Technologies for Building Energy Retrofit	15/04/2016	TGA Kongress, TU Berlin	Industry	100	Germany
87	Oral presentation to a scientific event	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Fraunhofer approach and ideas for building renovation (including RetroKit).	28/09/2015	Hochschule Wismar - University of Applied Sciences: Technology, Business and Design	Scientific community (higher education, Research)	30	Germany

88	Oral presentation to a wider public	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Energie Tour; focus on RetroKit insulation systems	27/10/2015	Freiburg	Scientific community (higher education, Research) - Industry - Civil society	50	Germany
89	Oral presentation to a wider public	SP SVERIGES TEKNISKA FORSKNINGENSINSTITUT AB	Forskningsprojekt på SP	03/03/2016	SP-dag i ett resiliellt samhälle, Lund	Industry	30	Sweden
90	Web sites/Applications	SP SVERIGES TEKNISKA FORSKNINGENSINSTITUT AB	RetroKit newsletter no 7	08/06/2016	http://www.bwz.se/sp/b.aspx?l=c0d19454-75c2-45d2-ad56-4a9d768e15a4&r=164879&rsrc=32981345	Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias	1630	All countries in the consortium
91	Oral presentation to a wider public	FUNDACION TECNALIA RESEARCH & INNOVATION	Demanda energética en edificios y comunidades. Actividades de IEA EBC.	05/05/2016	Jornada sobre Sistemas Solares de Calor y Frío Aplicados a la Edificación. La participación Española	Scientific community (higher education, Research) - Industry - Policy makers	400	Spain
92	Organisation of Workshops	FUNDACION TECNALIA RESEARCH & INNOVATION	Outdoor full-scale test facilities for envelope components: how to get the best from them?	07/06/2016	CEA-INES, Le Bourget Du Lac, France	Scientific community (higher education, Research)	10	France
93	Organisation of Workshops	FUNDACION TECNALIA RESEARCH & INNOVATION	Results Seminar on Innovative Energy Generation Steel Skin	29/06/2016	Madrid, Spain	Industry	70	Spain
94	Articles published in the popular press	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.	Halvfabrikat ska ge FTX	22/08/2013	Energi & Miljö	Industry - Civil society - Policy makers - Medias		Sweden
95	Web sites/Applications	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.	Sanierung wird mit Multifunktionselement einfacher	23/01/2016	EnBauSa Newsletter	Industry - Civil society - Policy makers - Medias	15000	Germany

96	Articles published in the popular press	FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E. V.	Minimale Eingriffe für maximale Effizienz	15/04/2016	Deutsches Ingenieurblatt	Industry - Civil society	15000	Germany
97	Oral presentation to a wider public	FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E. V.	Oral presentation to architecture students of the Technical University of Munich	14/06/2016	Freiburg (Germany)	Scientific community (higher education, Research)	40	Germany
98	Oral presentation to a scientific event	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK TNO	RetroKit - retrofitting residential multi-family buildings. Evaluation of effects on indoor environmental quality.	03/07/2016	Indoor air 2016, Ghent, Belgium	Scientific community (higher education, Research)		Europe
99	Oral presentation to a wider public	FUNDACION TECNALIA RESEARCH & INNOVATION	Tecnalia, Construction Products & Systems Business Area, Solar-Thermal Systems	21/03/2016	IEA, SHC Task 56 Kick Off Meeting	Scientific community (higher education, Research) - Industry - Policy makers	50	Worldwide
100	Oral presentation to a wider public	SEGEL AS	Webinar om RetroKit	31/08/2016	Webinar on www.segel.no	Scientific community (higher education, Research) - Industry - Civil society - Policy makers	14	Norway
101	Organisation of Workshops	FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E. V.	Energetische Sanierung von Wohngebäuden mit vorgefertigten multifunktionalen Fassadensystemen	07/04/2016	University of Kassel	Industry	40	Germany

Section B (Confidential or public: confidential information marked clearly)

LIST OF APPLICATIONS FOR PATENTS, TRADEMARKS, REGISTERED DESIGNS, UTILITY MODELS, ETC.					
Type of IP Rights	Confidential	Foreseen embargo date dd/mm/yyyy	Application reference(s) (e.g. EP123456)	Subject or title of application	Applicant(s) (as on the application)

OVERVIEW TABLE WITH EXPLOITABLE FOREGROUND

Type of Exploitable Foreground	Description of Exploitable Foreground	Confidential	Foreseen embargo date dd/mm/yyyy	Exploitable product(s) or measure(s)	Sector(s) of application	Timetable for commercial use or any other use	Patents or other IPR exploitation (licences)	Owner and Other Beneficiary(s) involved
Commercial exploitation of R&D results	Multifunctional aluminium windows solution that combine, into an aluminium insulated box, shutter with a ventilation unit with heat recovery and night cooling ventilation mode with 120 m3/h volume flow rate.??	Yes	31/08/2017	multifunctional aluminium windows solution that combine, into an aluminium insulated box, shutter with a ventilation unit with heat recovery and night cooling ventilation mode with 120 m3/h volume flow rate	Building sector	During year 2017	Potential for patent application	BGTEC, Fraunhofer, Kokotas
Commercial exploitation of R&D results	Outer insulation and integrated air channels for introduce ventilation in existing buildings	No		Combination between outer insulation and integrated air channels through installing a central ventilation system on the outer facade	Building Sector	If the general technical approval is done (the manufacturer will manage this) the system can be directly brought to the market (due to the fire aspect, this may last up to two years)	The foreground knowledge with the project is owned by Fraunhofer IBP.	Fraunhofer IBP, potentially STO
Commercial exploitation of R&D results	Equipment and method to install the house networks (air ducts, heating pipes, electrical cables &) on the facade and to combine these networks with the installation of external insulation.	No		Easy way to install networks (air ducts, heating pipes, electrical cables&) on the facade and to combine these networks with the installation of external insulation and product associated	The product is positioned within the energetical retrofitting market for outer insulation materials	After reaching the technical approval, the system could be used on the market. Maybe it lasts another two years.	The patented rights are located at Fraunhofer ISE. License agreements to be done	Fraunhofer ISE, manufacturers interested in commercial licenses are Korff, Beck + Heun
Commercial exploitation of R&D results	Usual ETICS with improved coatings and paintings.	No		ETICS with improved coatings and paintings.	The product is positioned within the energetical retrofitting market and outer insulation material	The product is available on the market	All rights reserved from STO	STO
Commercial exploitation	PVT modules int	No		Combination of	The product is positioned	Time to market for	All rights reserved	STO, Fraunhofer ISE,

Commercial exploitation of R&D results	Integrating photovoltaic elements with solar-thermal aspects providing also insulation to the facade on which they are applied (3 in 1 system)			photovoltaic elements, solar-thermal elements and insulation material	integrated within the energetical retrofitting market	new functionalities can be estimated with 5 years	owned by STO	Kokotas, ICPE, Commercial partners already identified (Solarion)
General advancement of knowledge	An integrated facade element consisting of a solar thermal collector, a double skin facade forming an air channel for bringing in fresh air into the building and an air channel coated with desiccant material to dehumidify for the cooling process, is the development proposed within RetroKit project.	Yes		Integrated facade element consisting of a solar thermal collector, a double skin facade and an air channel coated with desiccant material	BIST (Building Integration of Solar Thermal). Solar cooling technologies.	At the end of the project the product is expected to have a Technology Readiness Level TRL5. There will be necessary 2 years of research and 2 years for certification.	Tecnalia is the owner, no patent applied	TECNALIA, AMS and Kokotas.??The development should be transferred at some point to an industrial consortium for its final stages of technical development (technology integration, manufacturing,...), market development, installation, etc.
Commercial exploitation of R&D results	The smart coating technology	No		Tailor made coatings	Retrofitting market for outer or inner insulation materials	It is estimated that the e-shop for the product could be launched during the first quarter of 2017	No need for any patent. A secrecy agreement is signed with employees.	STO
General advancement of knowledge	Decision support tool and decision support system (SW)	No		ICT decision support tool	Design, construction, refurbishment and renovation of buildings	Commercial use is foreseen during 2017	No patent on SW. Programming code is secret.	DAPP and all the project partners.
General advancement of knowledge	Methodology for the installation of combination of new prefabricated technologies for retrofitting	No		Methodology for building retrofitting using prefabricated systems developed in RetroKit	Retrofitting of residential buildings	2 years for refinement and optimization	n.a.	Dragados, Dapp, Sp, Blatraden and, with minor involvement the other partners of the consortium
General advancement of knowledge	New business models for building management	No		The service to be offered is consultancy in redefining companies' business models to address the market for up	Upgrading of existing residential buildings	Available	No IPR issues and no patent required	SEGEL, D'Appolonia

grading of existing residential buildings.

ADDITIONAL TEMPLATE B2: OVERVIEW TABLE WITH EXPLOITABLE FOREGROUND

Description of Exploitable Foreground	Explain of the Exploitable Foreground
<p>Multifunctional aluminium windows solution that combine, into an aluminium insulated box, shutter with a ventilation unit with heat recovery and night cooling ventilation mode with 120 m³/h volume flow rate.??</p>	<p>The product developed within RetroKit Project applied to Madrid demo building is a multifunctional aluminium windows solution that combine, into an aluminium insulated box, shutter with a ventilation unit with heat recovery and night cooling ventilation mode with 120 m³/h volume flow rate. The multifunctional framing elements implemented in the first demo of RetroKit project were studied to aim and optimize the integration between air exchange system and new windows. The new window, made in aluminium, is equipped with wood and aluminium technical box where an air exchange system for improve the air quality and energy saving within the flat can be inserted. A kitchen would be a good place for a window unit because it would expel cooking and smoke odours while bringing in fresh air to compensate. Designated smoking rooms would benefit in the same way. Models that are designed as energy recovery ventilators both heat the air and maintain the proper humidity level, at the same time, so that there is very little variance in the fresh air that's exchanged with the outgoing interior air. Multi-functional framing elements are standards compliant</p>
<p>Outer insulation and integrated air channels for introduce ventilation in existing buildings</p>	<p>Combination between outer insulation and integrated air channels through installing a central ventilation system on the outer facade. The product still needs a general technical approval. The most important requirement is the fire protection. The market offers a high potential because of the quantity of the existing multifamily houses, which have to be renovated next time. At the same time the product is really price attractive because there will be no additional costs against a usual ETICS but the advantage to provide air ducts at the same time</p>
<p>Equipment and method to install the house networks (air ducts, heating pipes, electrical cables&) on the façade and to combine these networks with the installation of external insulation.</p>	<p>Equipment and an easy way to install the house networks (air ducts, heating pipes, electrical cables...) on the façade and to combine these networks with the installation of external insulation. There are no comparable product yet. The market offers a high potential because of the quantity of the existing buildings, which have to be renovated next time. An important part of these buildings do not have enough place inside the rooms to install networks. Façade integration is a relevant solution for reducing the retrofitting costs for these buildings. The product still needs a general technical approval. The most important requirement is the fire protection. Two options are currently investigated: polystyrene or mineral wool. The approval will probably be easier to obtain for mineral wool as for polystyrene.</p>
<p>Usual ETICS with improved coatings and paintings.</p>	<p>Usual ETICS with improved coatings and paintings. The product ETICS already exists, but there should be an improvement for the coatings regarding functionality. The market offers a high potential of ETICS. ETICS are the most common methods of improving the thermal protection of external wall structures in Europe. It is the most popular thermal insulation system in countries such as Germany, Poland, Italy, Netherlands and Portugal.</p>
<p>PVT modules integrating photovoltaic elements with solar-thermal aspects providing also insulation to the facade on which they are applied (3 in 1 system)</p>	<p>PVT modules are a combination of photovoltaic elements with solar-thermal aspects providing also insulation to the facade on which they are applied (3 in 1 system). The combination of both technologies shows two main advantages: reduction of efficiency loss due to overheating of the PV element ("cooling"), and therefore production of hot water.</p>
<p>An integrated façade element consisting of a solar thermal collector, a double skin façade forming an air channel for bringing in fresh air into the building and an air channel coated with desiccant material to dehumidify for the cooling process</p>	<p>An integrated façade element consisting of a solar thermal collector, a double skin façade forming an air channel for bringing in fresh air into the building and an air channel coated with desiccant material to dehumidify for the cooling process, is the development proposed within RetroKit project. Fresh air flowing through the façade module will be dehumidified by contact with the desiccant material and afterwards cooled by passing through a Heat Exchanger (HE) and a Humidifier. Desiccant material will be regenerate by the circulation of heated air collected in the façade solar thermal collector. This system is suitable for its installation in sun-exposed façades (Unobstructed South facing façades). The DEC-AHU (Desiccant Air Handling Units) can be integrated into a façade system. This system can be integrated into both centralized and decentralized building ventilation installation. The possibility to be integrated into a decentralized ventilation installation represents accessibility to all building refurbishment projects.</p>

process, is the development proposed within RetroKit project.	
The smart coating technology	The smart coating technology is getting more and more popular during the last years, as it can provide special characteristics or improve energy performance of buildings or equipment without the need for large investment or major changes on building's envelope. From the other side, this technology, as is available in the market today, provides only the availability of one property (e.g. reflective, insulating) and not the ability to have more than one property at the same time. On the contrary, with this technology the final customer would have the ability to choose which property, from the available, he prefers and makes a "tailor made" coating that meets all the customer needs. The available options are IR-Reflective, Insulating and the antibacterial property that can improve the energy performance and of course the indoor air quality when used in ducts.
Decision support tool and decision support system (SW)	The result includes the decision support tool, the methodology and the results of the experience matured into the real scale implementation of the results. A ICT tool is created to provide data, transparency on payback, guidelines, and design support, according to the experience and the results gathered within the project
Methodology for the installation of combination of new prefabricated technologies for retrofitting	Methodology for building retrofitting using prefabricated systems developed in RetroKit. Using a combination of new technologies for retrofitting: multifunctional prefabricated modules for façades, prefabricated window elements including insulation, technical box including ventilation systems and heat exchangers easily accessible for maintenance. Centralization of the energy use systems contained or linked to the technical box.
New business models for building management	Within the RetroKit project we have used as main tool the Osterwalder's Business Modelling Canvas (the methodology is used for single businesses). This has been presented in plenary to the partners as a first introduction to the methodology. The key question is: how should key actors in the value chain, such as architects, prefabricated manufacturers and building contractors modify their business models if they plan to direct their business into retrofitting of existing buildings by using prefabricated solutions?

4.3 Report on societal implications

B. Ethics

1. Did your project undergo an Ethics Review (and/or Screening)?	No
If Yes: have you described the progress of compliance with the relevant Ethics Review/Screening Requirements in the frame of the periodic/final reports?	
2. Please indicate whether your project involved any of the following issues :	
RESEARCH ON HUMANS	
Did the project involve children?	No
Did the project involve patients?	No
Did the project involve persons not able to consent?	No
Did the project involve adult healthy volunteers?	No
Did the project involve Human genetic material?	No
Did the project involve Human biological samples?	No
Did the project involve Human data collection?	No
RESEARCH ON HUMAN EMBRYO/FOETUS	
Did the project involve Human Embryos?	No
Did the project involve Human Foetal Tissue / Cells?	No
Did the project involve Human Embryonic Stem Cells (hESCs)?	No
Did the project on human Embryonic Stem Cells involve cells in culture?	No
Did the project on human Embryonic Stem Cells involve the derivation of cells from Embryos?	No
PRIVACY	
Did the project involve processing of genetic information or personal data (eg. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)?	No
Did the project involve tracking the location or observation of people?	No
RESEARCH ON ANIMALS	

Did the project involve research on animals?	No
Were those animals transgenic small laboratory animals?	No
Were those animals transgenic farm animals?	No
Were those animals cloned farm animals?	No
Were those animals non-human primates?	No
RESEARCH INVOLVING DEVELOPING COUNTRIES	
Did the project involve the use of local resources (genetic, animal, plant etc)?	No
Was the project of benefit to local community (capacity building, access to healthcare, education etc)?	No
DUAL USE	
Research having direct military use	No
Research having potential for terrorist abuse	No

C. Workforce Statistics

3. Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).

Type of Position	Number of Women	Number of Men
Scientific Coordinator	8	11
Work package leaders	23	47
Experienced researchers (i.e. PhD holders)	17	35
PhD student	1	3
Other	45	66

4. How many additional researchers (in companies and universities) were recruited specifically for this project?	10
Of which, indicate the number of men:	7

D. Gender Aspects

5. Did you carry out specific Gender Equality Actions under the project ?	No
6. Which of the following actions did you carry out and how effective were they?	
Design and implement an equal opportunity policy	Not Applicable
Set targets to achieve a gender balance in the workforce	Not Applicable
Organise conferences and workshops on gender	Not Applicable
Actions to improve work-life balance	Not Applicable
Other:	
7. Was there a gender dimension associated with the research content - i.e. wherever people were the focus of the research as, for example, consumers, users, patients or in trials, was the issue of gender considered and addressed?	No
If yes, please specify:	

E. Synergies with Science Education

8. Did your project involve working with students and/or school pupils (e.g. open days, participation in science festivals and events, prizes/competitions or joint projects)?	Yes
If yes, please specify:	architectural competition among students
9. Did the project generate any science education material (e.g. kits, websites, explanatory booklets, DVDs)?	Yes
If yes, please specify:	website, booklet

F. Interdisciplinarity

10. Which disciplines (see list below) are involved in your project?	
Main discipline:	2.1 Civil engineering (architecture engineering, building science and engineering, construction engineering, municipal and structural engineering and other allied subjects)
Associated discipline:	2.2 Electrical engineering, electronics [electrical engineering, electronics, communication engineering and systems, computer engineering (hardware only) and other allied subjects]
Associated discipline:	2.3 Other engineering sciences (such as chemical,

	aeronautical and space, mechanical, metallurgical and materials engineering, and their specialised subdivisions; forest products; applied sciences such as geodesy, industrial chemistry, etc.; the science and technology of food production; specialised technologies of interdisciplinary fields, e.g. systems analysis, metallurgy, mining, textile technology and other applied subjects)
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G. Engaging with Civil society and policy makers

11a. Did your project engage with societal actors beyond the research community? (if 'No', go to Question 14)	Yes
11b. If yes, did you engage with citizens (citizens' panels / juries) or organised civil society (NGOs, patients' groups etc.)?	Yes, in communicating /disseminating / using the results of the project
11c. In doing so, did your project involve actors whose role is mainly to organise the dialogue with citizens and organised civil society (e.g. professional mediator; communication company, science museums)?	No
12. Did you engage with government / public bodies or policy makers (including international organisations)	No
13a. Will the project generate outputs (expertise or scientific advice) which could be used by policy makers?	Yes - as a secondary objective (please indicate areas below - multiple answer possible)
13b. If Yes, in which fields?	
Agriculture	No
Audiovisual and Media	No
Budget	No
Competition	No
Consumers	No
Culture	No
Customs	No
Development Economic and Monetary Affairs	No
Education, Training, Youth	No
Employment and Social Affairs	No
Energy	Yes
Enlargement	No
Enterprise	No
Environment	No
External Relations	No

External Trade	No
Fisheries and Maritime Affairs	No
Food Safety	No
Foreign and Security Policy	No
Fraud	No
Humanitarian aid	No
Human rightsd	No
Information Society	No
Institutional affairs	No
Internal Market	No
Justice, freedom and security	No
Public Health	No
Regional Policy	No
Research and Innovation	No
Space	No
Taxation	No
Transport	No
13c. If Yes, at which level?	European level

H. Use and dissemination

14. How many Articles were published/accepted for publication in peer-reviewed journals?	8
To how many of these is open access provided?	5
How many of these are published in open access journals?	1
How many of these are published in open repositories?	3
To how many of these is open access not provided?	2
Please check all applicable reasons for not providing open access:	
publisher's licensing agreement would not permit publishing in a repository	No
no suitable repository available	No
no suitable open access journal available	No
no funds available to publish in an open access journal	No
lack of time and resources	No
lack of information on open access	No

If other - please specify	
15. How many new patent applications ('priority filings') have been made? ('Technologically unique': multiple applications for the same invention in different jurisdictions should be counted as just one application of grant).	0
16. Indicate how many of the following Intellectual Property Rights were applied for (give number in each box).	
Trademark	0
Registered design	0
Other	0
17. How many spin-off companies were created / are planned as a direct result of the project?	2
Indicate the approximate number of additional jobs in these companies:	5
18. Please indicate whether your project has a potential impact on employment, in comparison with the situation before your project:	Increase in employment, In small and medium-sized enterprises
19. For your project partnership please estimate the employment effect resulting directly from your participation in Full Time Equivalent (FTE = one person working fulltime for a year) jobs:	0Difficult to estimate / not possible to quantify

I. Media and Communication to the general public

20. As part of the project, were any of the beneficiaries professionals in communication or media relations?	No
21. As part of the project, have any beneficiaries received professional media / communication training / advice to improve communication with the general public?	No
22. Which of the following have been used to communicate information about your project to the general public, or have resulted from your project?	
Press Release	No
Media briefing	Yes
TV coverage / report	No
Radio coverage / report	No
Brochures /posters / flyers	Yes
DVD /Film /Multimedia	Yes

Coverage in specialist press	Yes
Coverage in general (non-specialist) press	Yes
Coverage in national press	No
Coverage in international press	No
Website for the general public / internet	Yes
Event targeting general public (festival, conference, exhibition, science café)	Yes

23. In which languages are the information products for the general public produced?

Language of the coordinator	Yes
Other language(s)	Yes
English	Yes

Attachments	Final_picture_contacts.pdf
Grant Agreement number:	314229
Project acronym:	RetroKit
Project title:	RetroKit - Toolboxes for systemic retrofitting
Funding Scheme:	FP7-CP-IP
Project starting date:	01/09/2012
Project end date:	31/08/2016
Name of the scientific representative of the project's coordinator and organisation:	Mr. Andrea Ferrari D'APPOLONIA SPA
Name	
Date	21/10/2016

This declaration was visaed electronically by Nicolo OLIVIERI (ECAS user name nolivnic) on 21/10/2016