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SEVENTH FRAMEWORK PROGRAMME

EeB.NMP.2012-6 - Methodologies for Knowledge transfer within the value chain and particularly to SMEs

Deliverable 6.3: Enhancing Cross-Sectorial Cooperation

Practical Procedures, Recommendations and Guidelines Report

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1. INTRODUCTION

The ee-WiSE Project has been approved in the 2012 FP7 call, within the Theme: Methodologies for Knowledge Transfer within the Value Chain and particularly on SMEs and consists of an international consortium of 13 partners including research institutes, companies (also SMEs), universities and public entities from 7 different countries in the Mediterranean area. The main purpose of the ee-WiSE project was to develop a Framework for Knowledge Management and Transfer within the EE building retrofitting value chain in the Mediterranean, and with special attention to SMEs. The project has been designed to achieve three main goals:

1) to reach the European Energy Efficiency (EE) targets,
2) to promote the building retrofitting sector, and
3) to foster knowledge transfer within agents of the value chain.

The present deliverable is expected to provide a framework of practical procedures, recommendations and guidelines underlining knowledge transfer within the value chain and particularly for SMEs. For this reason it presents the current situation regarding energy efficiency, describes the aims and goals of the ee-WiSE project in this context, and proposes a specific methodological approach for knowledge management and transfer within the EE building retrofitting value chain in the Mediterranean.

1.1. Field of application - Scope

Figure 1: Mediterranean basin

This document's key goal is to stimulate retrofit market activities that move beyond traditional public awareness campaigns, program maintenance, demonstration projects, and other "one-time" strategies and projects. Specifically, this deliverable seeks to fill the gap in knowledge transfer activities and investments that are prevalent in the retrofitting market in ways which can fundamentally and permanently transform energy markets in the Mediterranean region in a way that make retrofitting and energy efficiency the options of first choice, together with establishing a self-sustaining retrofit market. This document is designed to overcome one of the major barriers to adoption of potential retrofitting measures by providing access to information, and access to skilled workers. This is expected to enable retrofit companies and other complementary industries to increase their capacity to serve the Mediterranean markets better, while providing the necessary economies of scale and market competition that can drive down the cost of products/services and establish a more sustainable retrofit

market. So while the field of application is focused primarily towards Mediterranean organisations involved in the retrofitting market, the majority of issues raised and addressed also have relevance to the rest of the European market.

1.2. The ee-WiSE: A tool for knowledge transfer improvement across the value chain

The Energy Efficiency sector is expected to experience momentum through an increase in the retrofitting activity since rehabilitation of the existing building stock can provide more energy efficiency opportunities compared to that of new buildings[1]. The existing buildings' energy impact must be reduced in order to reduce the final CO2 emissions resulting from the buildings' energy consumption. Unfortunately the Energy Efficient Retrofitting knowledge generated over the years by the value chain agents involved has not been managed correctly and consequently knowledge transfer actions are practically inexistent. There are a small number of identified processes currently active throughout the Mediterranean countries that boost Knowledge Transfer in order to promote the EE sector[2]. In a real scenario, the knowledge generated in the EE sector should result in added benefits across the value chain[3]. This turns out to be the main problem of the EE sector: knowledge transfer is not effective between the different agents of the value chain. Therefore the questions that need to be answered are:

- Why do the knowledge and policies applicability not flow to all Value Chain Agents?
- Why do most companies operating in the field of building retrofitting ignore such policies, and even worse, do not respond to the demand from users in terms of improving energy efficiency in their homes?

It is vital to determine where the system failures or weakness in the KT are, that prevent existing knowledge, both from a technical and an economic-social point of view, to come to the companies so these can take the important role they deserve to encourage energy efficiency improvements in buildings.

The main objective of ee-WiSE is to develop a Framework for Knowledge Management and Knowledge Transfer within the energy efficient building retrofitting value chain with special attention to SMEs in the Mediterranean Area. ee-WiSE has identified, through a complex methodology, the critical points of this knowledge transfer (**KT**) flows, in order to act on its breakpoints. The combination of a phase of analytical work and another of Knowledge Transfer Framework design and validation will provide the industry with a valuable tool to help improve the EE market. The main output of the project is the creation of a Knowledge Transfer Tool that introduces a Knowledge Transfer methodology focused on building retrofitting within the value chain, to enhance the Energy Efficiency's Market in the Mediterranean area. The main advantages of the Knowledge Transfer Framework are:

- It improves the knowledge flow throughout the Value Chain, thus ensuring that the companies participate in sharing and usage of the current research knowledge, providing a solution to what the user requires through designers and prescribers.

[1] http://www.economistinsights.com/sites/default/files/downloads/EIU_GBPN_EnergyEfficiency_120921r3.pdf
[2] http://energies2050.org/wp-content/uploads/2014/03/2014-03-14-Final-Agenda_Round-Table_Johnson-Controls.pdf
[3] http://www.ener2i.eu/related_projects/r2i_cluster_mediterranean

- Moreover, it enhances the value of tested functional and cost-effective construction solutions/materials already offered by producers.
- It offers a tool for the different administrations that can be used to coordinate the development of regulations in their competence levels and control mechanisms of compliance with uniform and objective criteria.
- By including certification bodies, this project takes into consideration an agent that just validates building companies' accomplishment in terms of energy efficiency to the administration authorities, financial institutions and of course the end user.

1.3. The Approach

The methodology developed for carrying out the ee-WiSE project followed a logical progression in which each specific objective was tackled within a work package (WP) of works.

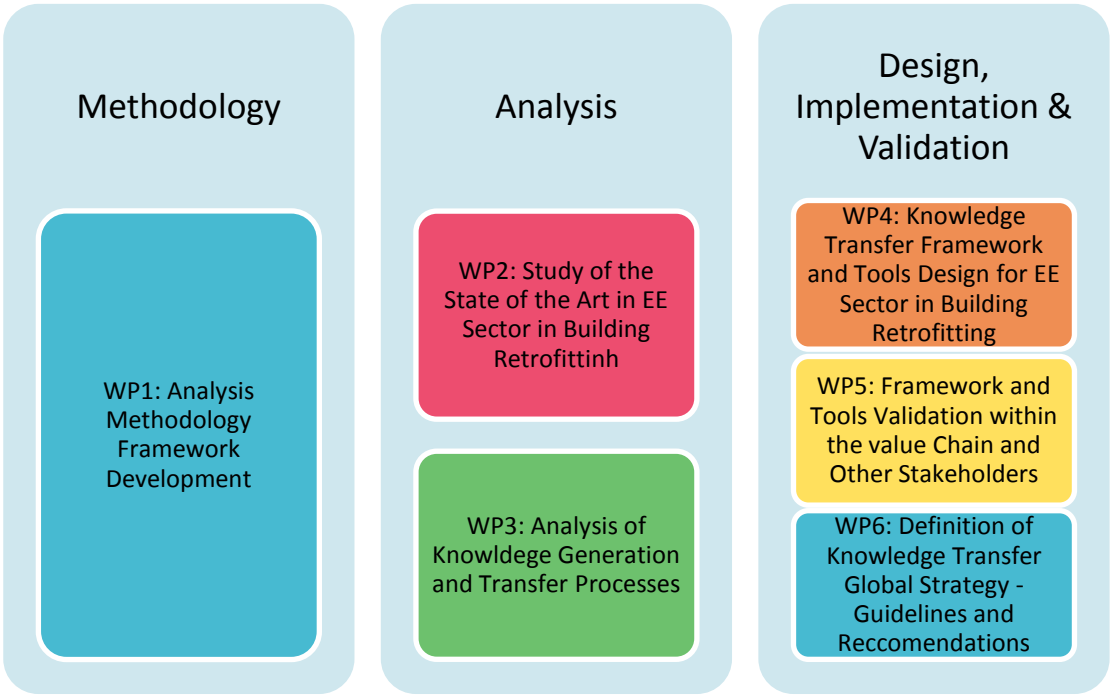

Figure 2: The ee-WiSE project stages

More in detail:

- **<u>Work package 1: Analysis Methodology Framework Development</u>**

The goals of this WP were to identify a solid methodology for determining the most effective procedures for conceptualizing the items that will be studied; a set of optimal tools for undertaking the analysis of each designed concept, and a methodological frame which constituted an integrated tool containing all the data captured during the analysis phase. The main deliverable of the specific Work Package was a Methodological framework with tools for data collection of relevant information, providing a systematic set of procedures for the scientific and technical coordination and management of the project. Additionally, it included the description of the value chain, as well as the related concepts with respect to the value chain and energy efficiency in a Mediterranean climate.

- **Work package 2: Study of the state of the art in the EE sector in building retrofitting**

The goals of this WP were: a) compilation and study of current situation in knowledge transfer processes and practices in the EE sector in building retrofitting with special attention to aspects concerning SMEs and b) an identification of current underlying knowledge transfer processes, between agents of the value chain, detecting existing gaps. WP2 yielded two deliverables: a State-of-the-Art Base Report and a Knowledge Transfer Flows Analysis Report. The State of the Art Base Report of the current situation provided evidence on the global status of Knowledge in the EE sector and the Knowledge Transfer Processes Analysis report showed through a Knowledge Transfer Flows Map its real state and its breakpoints, including a SWOT analysis.

- **Work package 3: Analysis of knowledge generation and transfer processes**

The main goal of this WP was to determine the framework conditions and specific support agents required in order to successfully activate the sector. In addition, the most important needs and barriers hindering or enabling knowledge transfer were identified for each individual value chain group, by means of a consultation process that involved the value chain agents themselves and that produced a ranked list of knowledge transfer needs. The main deliverable was a Knowledge Generation and Transfer Processes Report that identified the major stumbling blocks and required solutions to overcome the lack of knowledge transfer flow in the retrofitting value chain, and also included a detailed inventory of best practices.

- **Work Package 4: Knowledge Transfer Framework and Tools Design for EE Sector in Building Retrofitting**

The goals of this WP were a) to establish a solid methodology as a way to find the best procedures to conceptualize the items that will be studied, b) to design optimal tools to undertake the analysis of each designed concept, c) to develop a methodological frame which will be able to create an integrated tool that stores all the data captured during the analysis phase and finally, to ensure the active participation of all stakeholders providing the project co-creative capacity. The above goals have been fulfilled through two main deliverables, D4.1 ee-Wise KTF Design and D4.2 Virtual Knowledge Transfer Tool Description. Task 4.1 dealt with the design and implementation of the KT platform. The design took into consideration the material designed in Deliverable 4.2 together with a web platform for allowing users to upload content as providers and search and view content as receivers.

- **Work Package 5: Framework and Tools Validation within the value Chain and Other Stakeholders**

The main goal of WP5 was to get feedback from the representatives of the value chain through an iterative workshop process which validated the adequacy of the knowledge transfer framework and knowledge management tools developed in the previous WPs. A Framework and Knowledge Management Tools Validation Plan was developed (Deliverable 5.1) to set out the methodology, planning and monitoring of the validation activities. The Knowledge Transfer Framework, Knowledge Transfer Guidelines and ICT tools developed in WP4 were validated using a two-level approach, where the validation actions were implemented on a country level, as well as on a consortium level. During the primary validation phase, the developed KTF, guidelines and Tools were presented to the target audience – agents of the value chain – in workshops in each of the partner countries. The regional workshops were followed by the consortium-level workshop, aimed to validate the developed knowledge transfer framework. The results of the validation actions were used to develop the Validation report and conclusions, which was the second deliverable of Work Package 5. The Report included an Enhancement Plan with a number of recommendations for improvement of the Knowledge Transfer Tool (KTF). Most recommendations were implemented before the end of WP5 and a new improved version of the KTF was released.

- **WP6 "Definition of the Knowledge Transfer Global Strategy: Guidelines and Recommendations"**

WP6 was based on:

a) The theoretical know-how gained from WP2 and WP3,

b) The development of KT Framework and KT Tool developed WP4 and

c) The practical based evidences obtained through WP5 validation experiences.

The objectives of work package 6 were:

- Define a set of Knowledge Transfer Processes regarding the main milestones in Knowledge management, according to the sector's needs and the situation deriving from previous WPs, to enhance contact and communication between agents of the value chain and develop their intellectual capital for productive knowledge sharing and usage.
- Based on the study and analysis of best practices and evidence gathered through validation activities "Recommendations and Guidelines will be developed for the sector".
- Uptake of tacit knowledge implicit within the Sector's value chain.

1.3.1. The Deliverables

Work Package 6 deliverables are:

- D6.1: Business Models: Practical procedures, recommendations and Guidelines Report
- D6.2: Promoting Market up-taking measures: Practical procedures, recommendations and Guidelines Report
- D6.3: Enhancing Cross-Sectorial Cooperation: Practical procedures, recommendations and Guidelines Report
- D6.4: Standardization, Public Procurement and Certification: Practical procedures, recommendations and Guidelines Report

Each of those deliverables answers:

a) Knowledge Generation: How to generate new knowledge
b) Knowledge Sharing: How to effectively share this knowledge
c) Knowledge Dissemination: How to disseminate and use the knowledge with maximal effect

The four deliverables address these issues from the perspective of all agents with special attention to:

A. Policy recommendations concerning the promotion and support for sustainable business models
B. Successful development of multi-skilled SMEs' partnerships

Analysis of the Deliverables

- **D6.1: Business Models: Practical procedures, recommendations and Guidelines Report**

Definition: "A business model" describes the method or means by which the different value chain agents will transform the knowledge gathered into creating a profitable business. Business models are an essential part of strategy formation – they provide the fundamental link between product markets within the industry, and the markets for the factors of production. A business model may be based on many different aspects of the accumulated knowledge while concentrating on value creation.

- **D6.2: Promoting Market uptake measures: Practical procedures, recommendations and Guidelines Report**

Definition: "Market Up-Take" is the rate or extent to which EE Retrofit technologies are implemented in a country or region. A successful market up-take depends on how well the building owners and building managers respond to the retrofit technologies showcased to them. It involves a change in the society's behaviour and readiness to learn about and implement new technologies into their everyday life.

- **D6.3: Enhancing Cross-Sectorial Cooperation: Practical procedures, recommendations and Guidelines Report**

Definition: Cross-sectorial cooperation as applied to the EE retrofitting sector is the interaction between the professional agents of the value chain that are involved in technical and innovative developments. A good cooperation amongst agents will lead to an effective knowledge sharing, dissemination or generation, and thus a promotion of the competitiveness of the sector.

- **D6.4: Standardization, Public Procurement and Certification: Practical procedures, recommendations and Guidelines Report**

Definition: "standardization, public procurement and certification" are the processes that Public Bodies are directly involved in within the energy retrofitting sector. These agents range from Administration and Regulation Organisms, to Certifying Entities being responsible for the development of the legal framework and the creation of other type of requirements which can affect the market.

1.4. Difference between Deliverables 6.1 – 6.2 – 6.3 – 6.4

Practical Procedures, Guidelines and Recommendations for...			
Business Models (D.6.1) Identifies the opportunities and obstacles existing in the process of knowledge transfer within the retrofitting market and provides a step by step guide on how to create business models for the examined sector.	**Promoting Market Up-take (D.6.2)** Identifies the best ways to bring the EE Retrofit technologies and relevant knowledge to the market via strategic communication and methods to effectively increase knowledge transfer flows between the value chain agents.	**Enhancing Cross-Sectorial Cooperation (D.6.3)** Identifies the best cooperation strategies to overcome knowledge transfer gaps between the value chain agents and foster the sector's development and innovation, as a result of this interaction.	**Standardization, Public Procurement and Certification (D.6.4)** Deals with the processes that Public Bodies are directly involved within the EE retrofitting sector. These agents are from Administration and Regulation Organisms to Certifying Entities as the responsible of the development of the legal framework and the creation of other type of requirements which can affect the market. Knowledge and ideas generation, knowledge sharing and knowledge dissemination and use involves different agents of the Value Chain.

Table 1: Objective of WP6 deliverables

Deliverable 6.3 is the third of four deliverables in Work Package 6. It is the direct outcome of Task 6.3 from WP6 that relates to the provision of guidelines for the value chain agents to enhance interaction between them and conduct to the sector's impulse. The recommendations and guidelines are based on an analysis made based on extensive set of questions, which constitute a vital tool that will enable anyone interested to share knowledge for energy efficiency.

2. METHODOLOGICAL APPROACH

2.1. Agents Definition

In the first phase of ee-WiSE, a full analysis of the EE Retrofitting Sector Value Chain was undertaken in order to ensure a full and complete common understanding of the issues at hand. The value chain key players are classified in the chart below according to their roles in the retrofitting flow chart. From left to right, each actor plays their role in the EE retrofitting flow chart in one or some of the stages; analysis of current conditions, methodology, application and/or verification, respectively. All these players have also top to bottom or vice versa dependencies to each other while playing their role in the flow chart. Additionally, in this value chain graph, the key players role is described as being a value chain main actor, or as a service provider or as being in the enabling environment is also shown in different colours as well as they are located in different areas of the value chain.

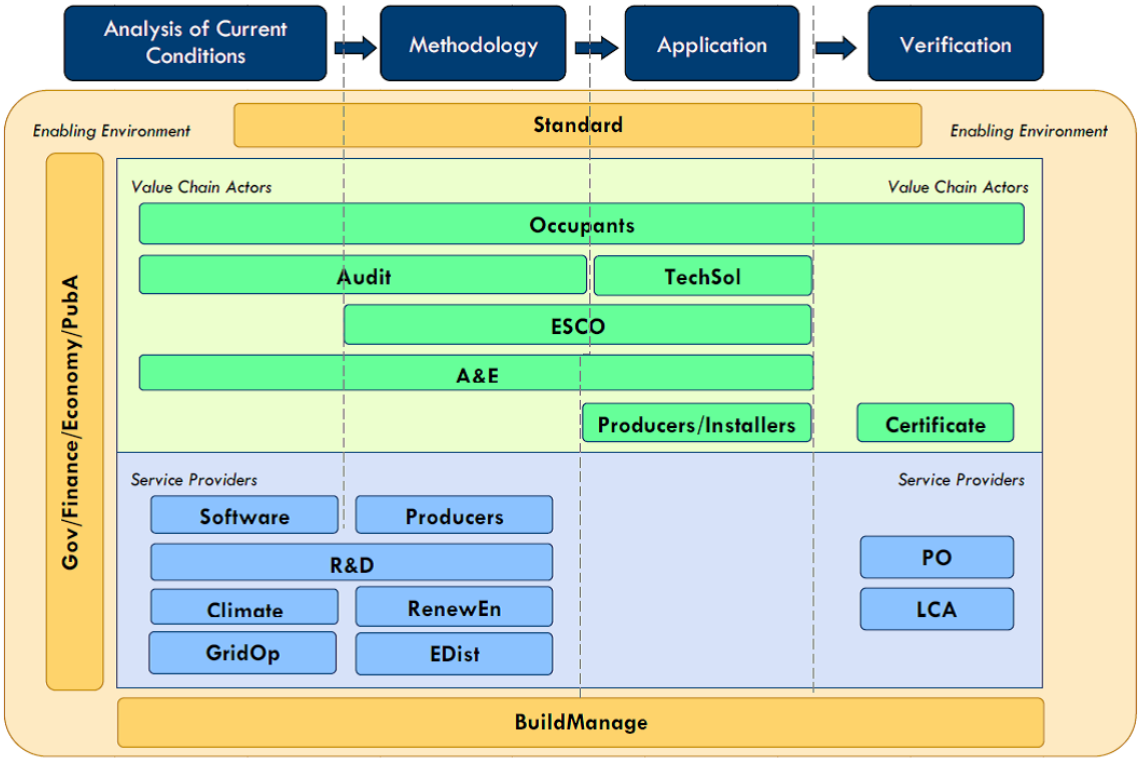

Figure 3 Energy Efficiency Retrofitting Sector's Value Chain

Abbreviations used in the Value Chain Graph

- **A&E:** Architecture and engineering companies (civil, mechanical, electrical, environmental),
- **Audit:** Energy auditing firms,
- **Build Manager:** Real Estate agents and householders and building managers,
- **Certificate:** Certification bodies,
- **Climate:** Meteorologists,
- **Economy:** Economists,
- **EDist:** Energy distributors,
- **ESCO:** Energy service companies,
- **Finance:** Banks, Financial Agents, Promoters, Subsidizers,

- **Government:** Government,
- **GridOp:** Electric Power Transmission Grid Operators (GridOp)
- **Installers:** Installers of building systems, building materials,
- **LCA:** Life cycle assessment bodies,
- **Occupants:** Homeowners and building users, occupants,
- **PO:** Intellectual property bodies and patent offices.
- **Manufacturers:** Manufacturers of building elements, building materials,
- **PubA:** Public administration and authorities (ministries, municipalities, etc.),
- **R&D:** R&D institutes, universities,
- **RenewEn:** Renewable energy companies,
- **Software:** Software developers,
- **Standard:** Standardization bodies,
- **TechSol:** Technical solutions developers companies.

Definitions:

1. **Financial Agents:** These are the Banks, Promoters, Subsidizers and other financial institutions financing green entrepreneurship as well as EE retrofitting projects.
2. **Public Administration and Government:** They act as policy makers, facilitate EE Building Retrofitting initiatives, and play a role in the development of green entrepreneurship on materials and services, etc.
3. **Standardization bodies:** They are the organizations whose primary activities are producing technical standards relevant to EE retrofitting.
4. **Software developers:** They design software for estimating the energy consumption of buildings, EE performance simulation and monitoring purposes.
5. **R&D Institutes and Universities:** These are consultants, researchers, and building scientists who produce the scientific knowledge and direct the policies.
6. **Installers:** They install the EE retrofitting measures to buildings; they need to have an idea about novel developments in the sector.
7. **Meteorologists:** The climate, and thus regulations, varies from one country to another. These actors evaluate and direct EE retrofitting actions according to different climate zones analysis.
8. **Manufacturers:** Their work is to produce building elements/materials and the fixtures for these elements which are mainly used for EE retrofitting.
9. **Technical solutions:** These actors develop and provide innovative services and design retrofitting measures for buildings. Basically the implementation of EE retrofitting ideas is done by these experts.
10. **Renewable energy:** Companies that produce energy from renewable sources, solar, wind, hydraulic, geothermal, biomass, etc.
11. **Energy distributors:** They are responsible for transporting energy to final customers or to distribution stations that sell energy to final customers.
12. **Grid Operators:** They build, maintain and provide the necessary energy network. It is possible to measure and evaluate the regional, national or International energy consumption trends to evaluate the EE retrofitting actions.
13. **Architecture and Engineering (A&E):** Generally address building energy issues within new construction, renovation and retrofitting projects. Their mission is to ensure that the buildings are constructed and/or renovated meeting the standards and building plan specifications.

14. **Energy Service Companies (ESCO):** They provide energy services and energy efficient improvement measures for building retrofitting.
15. **Energy Audit Firms:** They obtain adequate knowledge of the existing energy consumption profile of buildings, identify and quantify cost-effective energy saving opportunities and report the findings.
16. **Intellectual Property Bodies (Patent):** They are responsible for examining and issuing or rejecting patents, designs and trademarks. Protection of IPR is very important for EE retrofitting area, as there are various novel research findings.
17. **Life Cycle Assessment companies (LCA):** They evaluate the total energy consumed in all steps from acquisition of the raw material to end product step and assess the sustainability of the buildings.
18. **Certification bodies:** They provide energy performance certification. They rate the buildings on how efficient (or inefficient) they are in accordance with the certification definitions given in the standards.
19. **Building managers:** Literally, they are the financial owners of the buildings or managers of building groups. They are the ones who provide support from the government or from financial agents.
20. **Occupants:** They are the users of the building and they need to be living in energy efficient, healthy and comfortable environments.

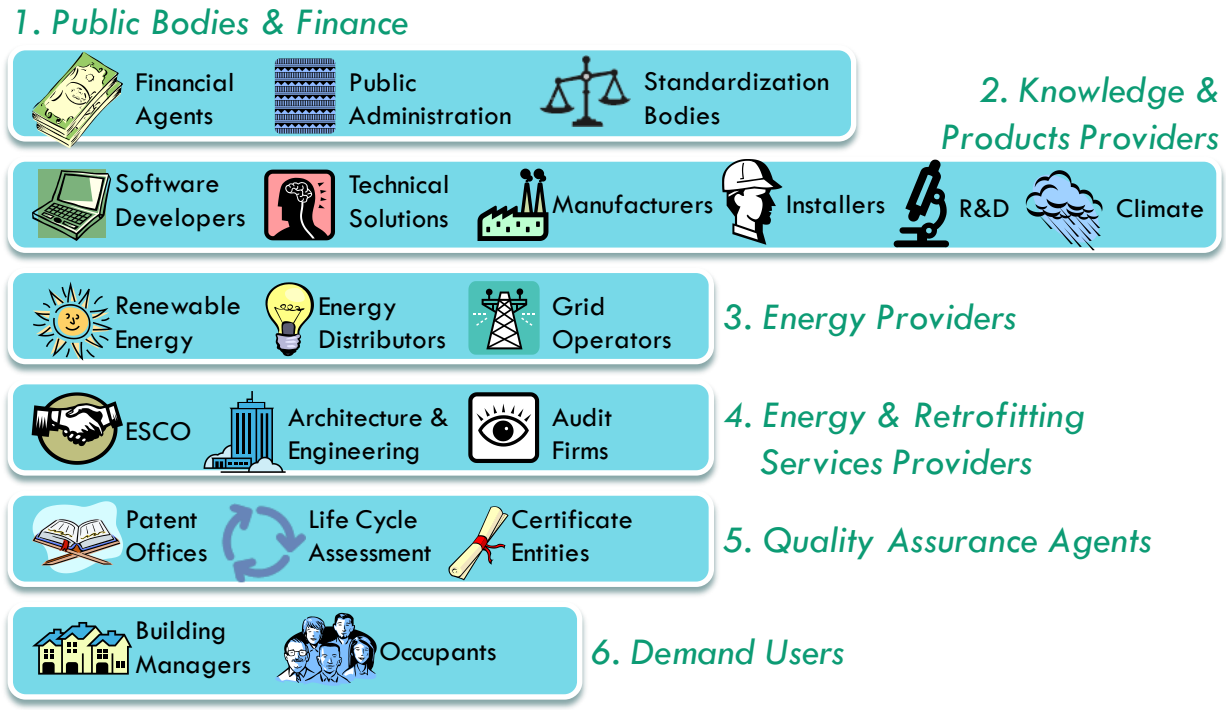

Figure 4 Value Chain Agents classified into Groups

2.2. Needs Category Definition

Based on the classification of WP1 & WP2, extensive research was carried out in WP3 with the objective to classify the needs for effective knowledge transfer through the retrofitting value chain into groups as is shown in 0. These needs, as identified through the desk research, were categorised into groups related to:

A. Skills & Awareness
B. Knowledge Management
C. Approach to R&D
D. Financial Conditions
E. Institutional & Administrative Conditions

Figure 5 Classification of the Value Chain Knowledge Transfer Needs

The complete list of KT needs as developed in Deliverable 3.1 is given in Table 1 below.

KT Need		***Description***
A1	Exposing Craftsmen to Innovation	*Traditional craftsmen need to have more exposure to retrofitting innovations.*
A2	End User Take-Up of Research Results	*The end users need to have a better capacity and motivation to take up the results of the research organisations and use these results in their buildings.*
A3	Business Society Access to Knowledge Stock	*The retrofitting business society needs to have a greater ability in knowing how to access the knowledge stock.*
A4	Managing Intellectual Property	*The business society needs to be aware of tools to manage intellectual property.*
A5	Training Architects & Engineers in Retrofitting Technology	*The construction industry professionals (including architects, civil engineers, building services engineers, project managers, building designers, etc) need increased training and exposure to retrofit technologies.*
B1	Building Consortia & Energy Efficiency Networks	*Need to have a network organisation that will organise contacts with companies, knowledge transfer from innovation groups and guidance of building teams in order to implement innovation into daily building practice.*
B2	Intra-Academy Interaction	*Research institutions have staffs that actively pursue links with industry, but need to increase interaction amongst them.*
B3	Clustering of Retrofit Market Solutions	*Need to cluster innovative solutions to address practical problems with integrated solutions*
B4	Connecting Commercial Advice to EPBD Activity	*Increased connection between technical commercial advice and the energy performance and requirements of the actual buildings.*
C1	Applicability to the End User	*Scientists need to have increased contact with the end-users in order to understand the applicability of their research.*
C2	Real-Life Evaluation of Research Results	*Scientists need to evaluate the results of their research through actual implementation of the technology in real-life situations and not only in the laboratory.*
C3	Working in Response to Market Trends	*The scientific society needs to be in increased contact with the end users in order to be able to divert their activity rapidly in response to changes in the market.*
D1	Public R&D Initiatives & Innovation Funding	*The need to increase business motivation through the availability of public R&D initiatives and innovation funding.*
D2	Support Industry in R&D Take-Up	*Need for financial support for the industry to take up results of scientific innovation.*
D3	Support Occupant in Retrofit Take-Up	*Need for financial support for the occupants to be in a better position to invest in retrofitting technology.*
E1	Guidelines for R&D to Address End-User Knowledge Needs	*The need for increased European Commission guidelines for the research organisations that address the needs of the end-users in terms of the knowledge that is required for uptake of the retrofitting technologies.*
E2	Criteria for R&D Project Evaluation	*The need for evaluating publicly funded research projects via it's applicability to the end-user.*

Table 2 Knowledge Transfer Needs

Furthermore, these identified needs were also inserted into the questionnaire that was distributed to the value chain members in order for them to classify the importance of each need and its relevance as per their individual experience on working within the retrofitting value chain. The table below displays the knowledge transfer need as classified from the most to the least important as identified by the value chain agents.

	KNOWLEDGE TRANSFER NEED	TOTAL ASSESSMENT
A5	Training of construction professionals (including architects, civil engineers, building services engineers, project managers, building designers, etc) in retrofit technologies.	9,43
D3	Occupants need financial support to invest in EE retrofitting technology.	9,29
A1	Training of traditional craftsmen on EE retrofitting innovations.	9,10
D1	Increase business motivation through public R&D initiatives and innovation funding.	9,04
D2	Industry needs financial support to take up results of scientific innovation.	8,93
C4	When communicating research results, more focus needs to be given to practical benefits of the retrofit technology.	8,81
C2	Real-life evaluation of research results.	8,22
E2	Evaluation of publicly funded research projects via it's applicability to the end-user.	8,09
C1	Scientists need to have increased contact with the end-users in order to understand the applicability of their research.	7,74
A3	Training the business society to access the knowledge stock.	7,71
B1	Establishing network organisations that will coordinate knowledge transfer from innovation groups and assist in implementing innovation into daily building practice.	7,57
C3	R&D to divert their activity rapidly in response to changes in the market.	7,52
E1	EC guidelines for knowledge dissemination from the research institutions.	7,35
B2	Increased interaction amongst research institutions.	7,26
A4	The business society needs to be aware of tools to manage intellectual property.	7,10
B3	Clustering within the retrofit market to provide integrated solutions.	6,22
A2	Exposing the end users to the technological results of the research organizations.	5,97
B4	Connecting technical commercial advice to EPBD - energy performance and requirements of the actual buildings.	5,57

Table 3 Classification of the Knowledge Transfer Needs

Identification of the Knowledge Management Tools that are best suited to convey knowledge through the value chain have been studied and defined in Work Package 4. WP4 identified knowledge management and training tools that are suggested as the best options for impacting positively on the rate of knowledge transfer through the value chain. The analysis carried out aims to become a valuable guide and good practice basis to any organization or agent that intends to develop training material that is engaging, interesting and attractive for a specific target group according to their needs and expectations, while at the same time valorising the new information and communication technologies (ICT) available on the world wide web to be used for education and informational activities.

In addition, consideration is made towards the key competencies – knowledge, skills and attitudes- that are necessary for personal fulfilment, development, social inclusion, active citizenship and employment, so as to assist the selection of the proper mechanisms and thus incorporating them into the final output of the project.

The matrix below summarises the 3 "most selected" ICT training tools for each value chain agent, and an additional one ranking distinguishing "most selected" ICT training tools from the information receivers' and information providers' point of view. The results shown in this matrix are also the basis of the functioning of the Knowledge Transfer Framework itself, such as the favourite tools per agent, per agent as receiver/ provider, etc..

Ranking Results per Agent

	MOST VOTED TOOLS PER NEED		1º	2º	3º
Public Bodies & Finance	**Financial Agents**	*R*	Podcasts (audio lectures)	Blog-based learning, social networking sites, community portals	Online forums
		P			
	Public Admin.	*R*	Blog-based learning, social networking sites, community portals	Podcasts (audio lectures)	Webinars, web meetings, online conferences
		P			
	GOV	*R*	Podcasts (audio lectures)	Blog-based learning, social networking sites, community portals	Online forums
		P			
	Standarization	*R*	Blog-based learning, social networking sites, community portals	Podcasts (audio lectures)	Webinars, web meetings, online conferences
		P			

Ranking Results (Receiver/ Provider)

1º	2º	3º
Podcasts (audio lectures) Podcasts (audio lectures)	Blog-based learning, social networking sites, community portals Simulation	Online forums Educational Games
Webinars, web meetings, online conferences Blog-based learning, social networking sites, community portals	Blog-based learning, social networking sites, community portals Podcasts (audio lectures)	Online forums Communication Tools
Podcasts (audio lectures) Podcasts (audio lectures)	Blog-based learning, social networking sites, community portals Simulation	Online forums Educational Games
Webinars, web meetings, online conferences Blog-based learning, social networking sites, community portals	Blog-based learning, social networking sites, community portals Podcasts (audio lectures)	Online forums Communication Tools

Knowledge & Products Providers	**Software Developers**	*R* *P*	Online forums	e-learning courses"(synchronous, asynchronous)	Communication Tools	Online forums Webinars, web meetings, online conferences	e-learning courses"(synchronous, asynchronous) e-learning courses"(synchronous, asynchronous)	Communication Tools Communication Tools
	Technical Solutions	*R* *P*	Online forums	e-learning courses"(synchronous, asynchronous)	Communication Tools	Online forums Webinars, web meetings, online conferences	e-learning courses"(synchronous, asynchronous) e-learning courses"(synchronous, asynchronous)	Communication Tools Communication Tools
	Manufacturers	*R* *P*	Webinars, web meetings, online conferences	Communication Tools	Online forums	Webinars, web meetings, online conferences Webinars, web meetings, online conferences	Communication Tools Online forums	Video in learning courses Communication Tools
	Installers	*R* *P*	e-book	Webinars, web meetings, online conferences	Video in learning courses	e-book Online forums	Video in learning courses Webinars, web meetings, online conferences	Webinars, web meetings, online conferences Podcasts (audio lectures)
	R&D	*R* *P*	Communication Tools	Simulation	e-learning courses"(synchronous, asynchronous)	e-learning courses"(synchronous, asynchronous) Simulation	Communication Tools Communication Tools	Wiki tools Online forums
	Climate	*R*	Communication Tools	Simulation	e-learning courses"(synchronous, asynchronous)	e-learning courses"(synchronous, asynchronous)	Communication Tools	Wiki tools

		P				Simulation	Communication Tools	Online forums
Energy Providers	**Renewable Energy**	R P	Webinars, web meetings, online conferences	Blog-based learning, social networking sites, community portals	e-learning courses"(synchronous, asynchronous)	Webinars, web meetings, online conferences Webinars, web meetings, online conferences	Blog-based learning, social networking sites, community portals Communication Tools	e-learning courses"(synchronous, asynchronous) Podcasts (audio lectures)
Energy Providers	**Energy Dsitributors**	R P	Webinars, web meetings, online conferences	Blog-based learning, social networking sites, community portals	e-learning courses"(synchronous, asynchronous)	Webinars, web meetings, online conferences Webinars, web meetings, online conferences	Blog-based learning, social networking sites, community portals Communication Tools	e-learning courses"(synchronous, asynchronous) Podcasts (audio lectures)
Energy Providers	**Grid Operators**	R P	Webinars, web meetings, online conferences	Blog-based learning, social networking sites, community portals	e-learning courses"(synchronous, asynchronous)	Webinars, web meetings, online conferences Webinars, web meetings, online conferences	Blog-based learning, social networking sites, community portals Communication Tools	e-learning courses"(synchronous, asynchronous) Podcasts (audio lectures)
Energy & Retrofitting Services	**ESCO**	R P	Webinars, web meetings, online conferences	Communication Tools	Simulation	Webinars, web meetings, online conferences Webinars, web meetings, online conferences	Communication Tools Simulation	Simulation e-book
Energy & Retrofitting Services	**Architect. & Engineer.**	R P	Webinars, web meetings, online conferences	Simulation	Video in learning courses	Webinars, web meetings, online conferences Simulation	Simulation Video in learning courses	Video in learning courses Online forums
Energy & Retrofitting Services	**Audit Firms**	R	Webinars, web meetings,	Communication Tools	Simulation	Webinars, web meetings, online conferences	Communication Tools	Simulation

		P	online conferences			Webinars, web meetings, online conferences	Simulation	e-book
Quality assurance	**Patent Offices**	*R* *P*	Online forums	Webinars, web meetings, online conferences	Communication Tools	Webinars, web meetings, online conferences e-learning courses"(synchronous, asynchronous)	Online forums Mind mapping	Mobile learning (mlearning) Blog-based learning, social networking sites, community portals
Quality assurance	**Life Cycle Assessment**	*R* *P*	Online forums	Webinars, web meetings, online conferences	Communication Tools	Webinars, web meetings, online conferences e-learning courses"(synchronous, asynchronous)	Online forums Mind mapping	Mobile learning (mlearning) Communication Tools
Quality assurance	**Certificate entities**	*R* *P*	Online forums	Webinars, web meetings, online conferences	Communication Tools	Webinars, web meetings, online conferences Online forums	Online forums e-book	Mobile learning (mlearning) Communication Tools
Demand	**Building Managers**	*R* *P*	Blog-based learning, social networking sites, community portals	Webinars, web meetings, online conferences	Online forums	Blog-based learning, social networking sites, community portals Blog-based learning, social networking sites, community portals	Webinars, web meetings, online conferences Webinars, web meetings, online conferences	Online forums Online forums
Demand	**Occupants**	*R*	Blog-based learning, social networking	Webinars, web meetings, online conferences	Online forums	Blog-based learning, social networking sites, community portals	Webinars, web meetings, online conferences	Online forums

		P	sites, community portals			Blog-based learning, social networking sites, community portals	Webinars, web meetings, online conferences	Online forums

				Ranking Results per Need			Ranking Results (Receiver/ Provider)		
		MOST VOTED TOOLS PER NEED		1º	2º	3º	1º	2º	3º
Task 4.2	E 1	EC guidelines for knowledge dissemination from the research institutions.	R	Communication Tools	Webinars, web meetings, online conferences	e-book	Communication Tools	Webinars, web meetings, online conferences	e-learning courses (synchronous, asynchronous)
			P				Communication Tools	Webinars, web meetings, online conferences	e-book
	A 2	Exposing the end users to the technological results of the research organizations.	R	Webinars, web meetings, online conferences	Simulation	Blog-based learning, social networking sites, community portals	Communication Tools	Webinars, web meetings, online conferences	Blog-based learning, social networking sites, community portals
			P				Simulation	Augmented Reality applications & software, Virtual Reality worlds	Webinars, web meetings, online conferences
	B	Connecting	R	Webinars, web meetings,	Online forums	Podcasts (audio lectures)	Podcasts (audio lectures)	Online forums	Mind mapping

	4	technical commercial advice to EPBD - energy performance and requirements of the actual buildings.	*P*	online conferences			Webinars, web meetings, online conferences	Online forums	Blog-based learning, social networking sites, community portals
Task 4.3	D 3	Occupants need financial support to invest in EE retrofitting technology.	*R* *P*	Communication Tools	Webinars, web meetings, online conferences	Video in learning courses	Communication Tools Podcasts (audio lectures)	Webinars, web meetings, online conferences Communication Tools	Video in learning courses Wiki tools
	D 2	Industry needs financial support to take up results of scientific innovation.	*R* *P*	Webinars, web meetings, online conferences	Communication Tools	Blog-based learning, social networking sites, community portals	Webinars, web meetings, online conferences Communication Tools	Blog-based learning, social networking sites, community portals Online forums	Communication Tools Webinars, web meetings, online conferences
	A 4	The business society needs to be aware of tools to manage intellectual property.	*R* *P*	Blog-based learning, social networking sites, community portals	Webinars, web meetings, online conferences	Mobile learning (mlearning)	Blog-based learning, social networking sites, community portals Blog-based learning, social networking sites, community	Webinars, web meetings, online conferences Webinars, web meetings, online conferences	Mobile learning (mlearning)

							portals		
Task 4.4	A 5	Training of construction professionals (including architects, civil engineers, building services engineers, project managers, building designers, etc) in retrofit technologies.	*R* *P*	Webinars, web meetings, online conferences	Simulation	e-learning courses (synchronous, asynchronous)	Webinars, web meetings, online conferences Simulation	Simulation Webinars, web meetings, online conferences	e-learning courses (synchronous, asynchronous) Educational Games
	D 1	Increase business motivation through public R&D initiatives and innovation funding.	*R* *P*	Webinars, web meetings, online conferences	Communication Tools	Video in learning courses	Webinars, web meetings, online conferences Webinars, web meetings, online conferences	Communication Tools Communication Tools	Video in learning courses Augmented Reality applications & software, Virtual Reality worlds
	E 2	Evaluation of publicly funded research projects via it's applicability to the end-user.	*R* *P*	Blog-based learning, social networking sites, community portals	Online forums	Simulation	Online forums Simulation	Blog-based learning, social networking sites, community portals Blog-based learning, social networking sites,	Webinars, web meetings, online conferences Podcasts (audio lectures)

								community portals	
	A 3	Training the business society to access the knowledge stock.	*R* *P*	Webinars, web meetings, online conferences	Educational Games	Video in learning courses	Webinars, web meetings, online conferences Webinars, web meetings, online conferences	Video in learning courses Educational Games	Educational Games e-learning courses (synchronous, asynchronous)
	B 1	Establishing network organisations that will coordinate knowledge transfer from innovation groups and assist in implementing innovation into daily building practice.	*R* *P*	Online forums	Webinars, web meetings, online conferences	Blog-based learning, social networking sites, community portals	Webinars, web meetings, online conferences Online forums	Online forums Blog-based learning, social networking sites, community portals	Blog-based learning, social networking sites, community portals Wiki tools
	C 3	R&D to divert their activity rapidly in response to changes in the market.	*R* *P*	Blog-based learning, social networking sites, community portals	Webinars, web meetings, online conferences	Video in learning courses	Blog-based learning, social networking sites, community portals Blog-based learning, social networking	Webinars, web meetings, online conferences Webinars, web meetings, online	Video in learning courses Online forums

							sites, community portals	conferences	
	B 2	Increased interaction amongst research institutions.	*R* *P*	Online forums	Communication Tools	Webinars, web meetings, online conferences	Webinars, web meetings, online conferences Communication Tools	Online forums Online forums	e-learning courses (synchronous, asynchronous) Blog-based learning, social networking sites, community portals
	B 3	Clustering within the retrofit market to provide integrated solutions.	*R* *P*	Video in learning courses	Webinars, web meetings, online conferences	Online forums	Webinars, web meetings, online conferences Video in learning courses	Blog-based learning, social networking sites, community portals Webinars, web meetings, online conferences	Video in learning courses Online forums
Task 4.5	A 1	Training of traditional craftsmen on EE retrofitting innovations.	*R* *P*	Simulation	Video in learning courses	e-book	Simulation Simulation	Video in learning courses Educational Games	Webinars, web meetings, online conferences Video in learning courses
	C 4	When communicating research results,	*R*	Online forums	e-learning courses (synchronous, asynchronous)	Blog-based learning, social networking sites,	Online forums	Blog-based learning, social networking sites,	Video in learning courses

		more focus needs to be given to practical benefits of the retrofit technology.	*P*			community portals	Online forums	community portals e-learning courses (synchronous, asynchronous)	e-book
	C 2	Real-life evaluation of research results.	*R* *P*	Communication Tools	Blog-based learning, social networking sites, community portals	Webinars, web meetings, online conferences	Communication Tools Communication Tools	Blog-based learning, social networking sites, community portals Blog-based learning, social networking sites, community portals	Online forums Webinars, web meetings, online conferences
	C 1	Scientists need to have increased contact with the end-users in order to understand the applicability of their research.	*R* *P*	Webinars, web meetings, online conferences	Online forums	Communication Tools	Communication Tools Blog-based learning, social networking sites, community portals	Online forums Webinars, web meetings, online conferences	Blog-based learning, social networking sites, community portals Online forums

Table 4 Mapping between Needs, Agents and Tools

2.3. The Approach used for the Practical Procedures, Guidelines and Recommendations: The Business Model Canvas Approach

There are many different approaches to business model development and each one of them has its strengths and weaknesses. WP6 deliverables are based on the Business Canvas Framework which is widely supported around the world and has become the standard in many industries. The Business Model Canvas was initially proposed by Alexander Osterwalder[4], based on his earlier work on Business Model Ontology[5]. The framework has been built by a collaborative effort of hundreds of industry practitioners and there is already an industry working with tools and concepts around this framework.

The basic requirement for a Business Model Canvas is to be able to respond to a basic question: what is your business model and how will you earn money? According to Osterwalder & Pigneur[6], a business model describes the rationale of how an organization creates, delivers, and captures value. The process of business model construction is part of the overall business strategy. The Business Model Canvas is nowadays one of the most used frameworks for describing the elements of a business model. A business model is the description of the overall environment of an organization and is defined by several aspects, which answer the questions of how an organization creates, delivers, and captures value in economic, social, cultural or other contexts. The main business model functions are: articulating the value proposition; identifying market segments; defining the value chain and the firm's position; formulating the competitive strategy as well as addressing broader social and environmental aspects.

The Business Model Canvas in the framework of WP6 of ee-WiSE is used as a methodological approach rather than a technical approach. It provides a way of thinking and a mind-set that each deliverable of the specific work packages follows. It is a theoretical framework upon which the analysis will rely on the categories and questions that have to be answered in order to elaborate the four different deliverables. Each deliverable is developed based on the same information but from a different point of view. The Business Model Canvas is displayed in 0 below.

[4] http://alexosterwalder.com/

[5] Alexander Osterwalder (2004). The Business Model Ontology - A Proposition In A Design Science Approach. PhD thesis University of Lausanne

[6] http://www.zebramc.com/introduction-to-the-business-model-canvas/

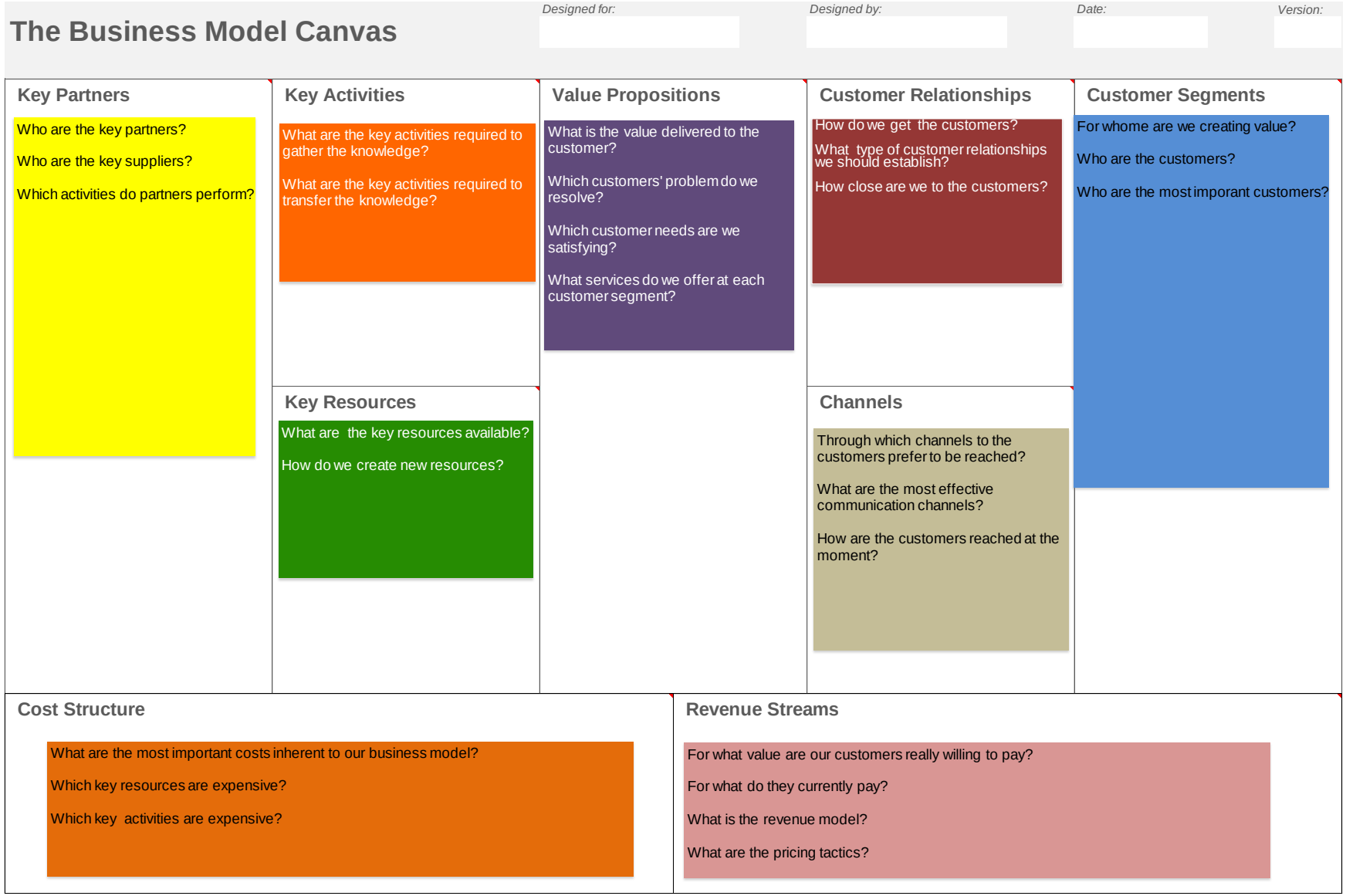

Figure 6 Analysis of the Business Model Canvas blocks

The Business Model Canvas components are:

Infrastructure

- **Key Activities.** This includes those steps that a value chain agent should take in order to be able to transfer knowledge in an added value approach, commonly known as the entity's value proposition.
- **Key Resources.** The Key Resources are those that are needed in order for the value chain agent indeed to create value for another agent and thus entice the flow of knowledge through the value chain. The Key Resources are also described as assets that are required in order to sustain and support the knowledge transfer. These resources could vary and could include the key staff involved, intellectual knowledge generated, physical infrastructure, etc.
- **Key Partners.** The partner network, or value chain agents as referred to within ee-WiSE, is the network of potential stakeholders who through collaboration can help in optimizing the operations and reduce risks of the knowledge transfer activity. For example if an agent wants to provide state of the art knowledge and hasn't got strong ties with universities that are usually the creators of state of the art knowledge, then the business model in any case couldn't be sustained for a long period of time since the knowledge offered will soon be out-dated.

Offering

- **Value Proposition.** This is defined as the knowledge base that the value chain agent s will offer to meet the needs of the knowledge receivers. According to Osterwalder, (2004), *a company's value proposition is what distinguishes itself from its competitors. The value proposition provides value through various elements such as newness, performance, customization, "getting the job done", design, brand/status, price, cost reduction, risk reduction, accessibility, and convenience/usability. The value propositions may be:*
    - Quantitative- price and efficiency
    - Qualitative- overall customer experience and outcome

Customers

- **Customer Segments.** A knowledge provider has to be able to categorize its different target groups and find ways that they could be served better. Usually in order to better sustain a knowledge transfer process for a long period of time, the needs of the various sets of knowledge receivers have to be satisfied a) in response to their different needs and b) their role in the value chain, e.g. the needs for policy makers are different to the needs of builders, so it is important to ensure that the corporate strategy will be implemented appropriately and thus satisfy the various needs of the selected group of clients.
- **Channels.** A channel refers to the knowledge transfer methodologies through which the knowledge will be provided to reach the targeted customers. Effective channels will distribute the knowledge in ways that are fast, efficient and cost effective. A knowledge provider can reach the knowledge receiver either through its own channels or partner/collaborators channels or through a combination of both.
- **Customer Relationship.** Usually this is one of the most important parts of a business model. A knowledge provider should be able to have solid relationship with the knowledge receivers if they want to ensure the survival and success of their knowledge transfer process.

Business Model Steps

In order to be able use the business model approach, three steps need to be followed:

Step 1 – The idea

- Scope: Solve our Target customers' problem and satisfy their needs
- How:

a) Understand Target End User Needs
b) Define the Need it will cover and how it will succeed
c) Create a Specific Offering

- Unsatisfied End User need?
- Doing Business in a different way?
- A new product or service that the market hasn't seen yet, or that is offered with a different or better value proposition?

Step 2 - Deliverable Design – (The added Value Formula)

- Scope: Identify the Key Resources & Key Processes

a) Present the strengths and weaknesses
b) Identify the Key Resources
c) Identify the Key Processes

Step 3 – Practical procedures, recommendations and Guidelines Report

- Scope: The restructuring of the deliverable based on the value chain agents feedback in relation to their expertise

a) Business objects have to be defined optimally from an information point of view as well as from a behavioural point of view
b) Information units have to be arranged in logical clusters and a certain information element must exist only once
c) Business procedures must be broken down to their elementary components, duplicate components have to be eliminated and the remaining components have to be assigned to a single owner - normally a certain agent

2.4. Methodology for Deliverable 6.3: Recommendations and guidelines for knowledge transfer regarding enhancing cross-sectorial cooperation.

Deliverable 6.3 aims to facilitate specific guidelines and recommendations to assist the development of mechanisms designed to share specific EE building retrofitting knowledge and promote the interaction of different agents that take part of the technological growth of the sector. The identification of best cooperation strategies are addressed to overcome knowledge transfer gaps between the value chain agents and foster the sector's development and innovation, as a result of this interaction.

Within the guidelines and recommendation section of this deliverable, the knowledge transfer needs have been categorised into a three-fold approach: Knowledge Generation, Knowledge Sharing and Knowledge Dissemination. The definition of the three-fold approach is detailed in section 3.

The guidelines and recommendations described in this deliverable are a result of the research that has been carried out in the previous ee-WiSE work packages together with sourcing of existing best practices that could lead to boost agent's interaction and the sector's intra cooperation, with the intention of procuring a more competitive and consistent sector across the Mediterranean region.

3. THE THREE FOLD APPROACH

3.1. Categorization of the Knowledge Transfer Needs

In order to achieve the Knowledge Transfer global strategy these WP6 closing deliverables have been organized, considering the 3 main aspects of *Knowledge Transfer* when focusing on the KT Needs. *Knowledge Transfer* involves not only good knowledge sharing, but generating new knowledge in a comprehensive way and effective knowledge dissemination as well. Thus, the 3 pillars of the Knowledge Transfer global strategy: Knowledge Generation, Knowledge Sharing and Knowledge Dissemination are used to categorize the sector's needs and cater for the threefold approach in a holistic way. Figure 8 below shows the classification of the needs in their 5 needs categories and the 3 Knowledge Transfer categories.

Knowledge Generation	
A1	Exposing Craftsmen to innovation
A3	Business Society Access to Knowledge Stock
A5	Training Architects & Engineers in Retrofitting Technology
B2	Intra-Academic Interaction
C3	Working in Response to Market Trends
D1	Public R&D Initiatives & Innovation Funding
E2	Criteria for R&D Project Evaluation

Knowledge Sharing	
C1	Applicability to the End User
C2	Real-Life Evaluation of Research Results
C4	Results Focusing on Practical Benefits

Knowledge Dissemination	
A2	End user Take Up of Research Results
A4	Managing Intellectual Property
B1	Building Consortia & Energy Efficiency Networks
B3	Clustering of Retrofit Market Solutions
B4	Connecting Commercial Advice to EPBD Activity
D2	Support Industry in R&D Take-Up
D3	Support Occupant in Retrofit Take-Up
E1	Guidelines for R&D to Address End-User Knowledge Needs

A. SKILLS & AWARENESS
B. KNOWLEDGE MANAGEMENT
C. R&D APPROACH
D. FINANCIAL
E. INSTITUTIONAL & ADMINISTRATIVE

Figure 7 Knowledge Transfer Needs within the three fold approach

3.2. Needs per categories

The table below shows how the needs have been associated within each one of the deliverables' topics. Each deliverable contains recommendations on the specific topics that are provided to assist in satisfying the knowledge transfer needs associated to the topic in a comprehensive manner, using the Knowledge Transfer threefold approach background

		Knowledge Transfer Needs within the three fold approach	Deliverables			
			D6.1	D6.2	D6.3	D6.4
Knowledge Generation	A1	Exposing Craftsmen to innovation	1	1	1	
	A3	Business Society Access to Knowledge Stock	1	1		
	A5	Training Architects & Engineers in Retrofitting Technology	1	1	1	1
	B2	Intra-Academic Interaction			1	1
	C3	Working in Response to Market Trends	1	1		
	D1	Public R&D Initiatives & Innovation Funding	1			1
	E2	Criteria for R&D Project Evaluation	1	1		1
Knowledge Sharing	C1	Applicability to the End User	1	1	1	
	C2	Real-Life Evaluation of Research Results	1	1		1
	C4	Results Focusing on Practical Benefits		1	1	
Knowledge Dissemination	A2	End user Take Up of Research Results	1	1	1	
	A4	Managing Intellectual Property	1	1		1
	B1	Building Consortia & Energy Efficiency Networks		1	1	1
	B3	Clustering of Retrofit Market Solutions		1	1	
	B4	Connecting Commercial Advice to EPBD Activity	1	1	1	1
	D2	Support Industry in R&D Take-Up	1	1		1
	D3	Support Occupant in Retrofit Take-Up	1	1		1
	E1	Guidelines for R&D to Address End-User Knowledge Needs		1	1	
		Needs Per Deliverable	13	16	10	10

Table 5: Knowledge Transfer Needs assigned to each WP6 Deliverable

Guidelines and recommendations for each of the knowledge transfer needs as they have been split into the three-fold approach are detailed in Chapter 4 where methods to meet the knowledge transfer needs are explored and tackled within the knowledge generation, knowledge sharing and knowledge dissemination points of view.

3.3. Analysis of Knowledge Transfer Needs Related to Knowledge Generation

Knowledge generation is defined as the development of research outputs or research syntheses that allows for the formation of new ideas through interactions between explicit and tacit knowledge in human minds.[7] The ability to generate new knowledge is crucial to the success of an industry and to improving the effectiveness of technology.

Knowledge generation according to Nonaka's SECI Model (2001)[8] is about continuous transfer, combination, and conversion of the two different types of knowledge (Frost 2014)[9], namely:

- Explicit knowledge

  Knowledge that is formalised and codified and is stored in documents, databases, etc. This knowledge is fairly easy to identify, store and retrieve.

- Tacit knowledge

  This is intuitive knowledge and know-how that is rooted in experience and practice. Although this knowledge is hard to communicate, it is regarded as the most valuable source of knowledge and the most likely to lead to breakthroughs in technology.

Within the SECI Model, Nonaka describes four modes of knowledge generation:

a. **Socialization** - This dimension relates to social interaction (tacit to tacit knowledge transfer), sharing knowledge through face-to-face encounters or through experiences. For example, meetings and brainstorm sessions form part of this mode of interaction.
b. **Externalization** - Publishing knowledge that is tacit in nature into a form that makes it explicit allowing it to be shared with others, thus becoming the basis for generation of new knowledge. For example, concepts, images and written documents used in new product development.
c. **Combination** - This dimension relates to the usage of existing explicit knowledge banks that are organised, edited and processed to create new explicit knowledge. For example, the building of prototypes.
d. **Internalization** - The process of internalisation refers to learning by doing thus converting explicit knowledge into tacit knowledge. It is a process of continuous individual and collective knowledge generation that gives the added ability to see connections and recognise patterns thus creating the possibility for new ideas and concepts.

Also, Cook and Brown (1999)[10] distinguish between explicit and tacit knowledge, and suggest that knowledge generation is a product of the interplay between them. The shift in condition between the possession of knowledge and the act of knowing - something that comes about through practice, action, and interaction- is the driving force in the generation of new knowledge. Furthermore, in order for this interplay to be most fruitful, it is important to support unstructured work environments in areas where creativity and innovation are important.

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[7] Business Directory: definition for knowledge creation
[8] Nonaka, I., Toyama, R., Byosiere, Ph. (2001) "A theory of organizational knowledge creation: understanding the dynamic process of creating knowledge", in: Dierkes, M., Antal, A.B., Child, J., Nonaka, I. (eds.) Handbook of organizational learning and knowledge, pp.487-491, Oxford University Press, Oxford.
[9] Frost, Alan (2014). A Synthesis of Knowledge Management Failure Factors. http://www.knowledge-management-tools.net/A%20Synthesis%20of%20Knowledge%20Management%20Failure%20Factors.pdf
[10] Cook, S.D.N. and J.S. Brown (1999) Bridging Epistemologies: The Generative Dance between Organizational Knowledge and Organizational Knowing. In: Organization Science 10 (4), pp.381-400.

One might say that knowledge generation relies on knowledge sharing combined with the ability to put knowledge into practice in an environment which supports interaction and experimentation. Knowledge is generated through practice, collaboration, interaction, and education, as the different knowledge types are shared and converted. Beyond this, knowledge generation is also supported by relevant information and data which can improve decisions and serve as building blocks in the generation of new knowledge.

According to the methodological framework described earlier and the Business Model Canvas approach, ee-WiSE consortium members had used the Business Model Canvas components in order to categorize the information collected from all the previous work packages of the project. The categorization is based on the needs as they had been distributed in WP3.

<table>
<tr><th colspan="3">A1. Exposing Craftsmen to innovation</th></tr>
<tr><td>Key partners</td><td colspan="2">1.Knowledge and Products Providers
- Technical Solutions Developer
- Software Developer
- Manufacturer
- R&D
2.Energy and Retrofitting Services Providers
- Architect & Engineer
3.Energy Providers
- Renewable Energy</td></tr>
<tr><td>Key activities</td><td colspan="2">Expose the traditional craftsmen to demonstration projects.
Tools for the home-owner and traditional craftsmen for the decision making</td></tr>
<tr><td>Key resources</td><td colspan="2">- Material related to Experimental Building Projects, thus the exploitation of buildings and tools to disseminate results is necessary.
- Creating a connection of Experimental Building Projects to training programmes for traditional craftsmen.
- Creating a connection of Experimental Building Projects to knowledge providers to expose their technology.</td></tr>
<tr><td rowspan="2">Value Proposition</td><td>Tools

KTF Tool (ee-wise.eu)</td><td>Networks
http://www.proyectoedea.com/en/
http://e4rsim2.aidico.es/
http://www.arfrisol.es/ARFRISOLportal/
http://www.youtube.com/user/Trainenergy/videos
http://www.u4energy.eu/web/guest/33</td></tr>
<tr><td>Tips for Effective Knowledge transfer
- Keep always a visual and simple explanation of how the EE system works and is installed.
- Notice that simulation tools are the favourite choice for this Knowledge, so software developers need to get involved.
- Use videos apart for the e-material to disseminate EE building components and systems if you are a solutions designer.
- Experimental building projects have a lot of useful demonstration material for EE training.
- If you are related to an experimental building, allow visitors for a living demonstration in</td><td>Best Practices
- http://www.proyectoedea.com/en/
Research project that developed 2 Experimental buildings to obtain comparative real-time data from passive/active systems simulated and tested. Visitors are welcomed!
- http://e4rsim2.aidico.es/
Simulation Tool developed throughout E4R Project which is capable of providing an estimated energy efficiency evaluation of your building online.
- http://www.arfrisol.es/ARFRISOLportal/
PSE-ARFRISOL is a project that aims for the adequacy of bioclimatic architecture and solar energy in symbolic public buildings. The simulation of the buildings can be checked online.
- http://www.youtube.com/user/Trainenergy/videos
Train energy YouTube channel that provides</td></tr>
</table>

	order to produce impulse the training experience and assist connecting EE directly to the market. - Keep the experimental building updated by collaborating with solutions designers to test their EE measures.	videos explaining hoe EE measures work and are installed in real life. (German - English) - http://www.u4energy.eu/web/guest/33 The U4energy website offers resources to help teachers, students and school management introduce energy efficiency in the classroom and replicate proven success stories!
Customer Relationship	Active Relationship (Personal Contact) Automated Systems (Newsletter, Simulation, Video in learning courses, e-book)	
Channels	Brochures with simple explanations, e-material, simulation tools and videos, which contain demonstration of EE measures.	
Customer Segments	**1.Knowledge and Products Providers** - Installer **2.Energy and Retrofitting Services Providers** - Architect & Engineer	

A3. Business Society Access to Knowledge Stock		
Key partners	**1.Knowledge and Products Providers** - Technical Solutions Developer - Software Developer - Manufacturer **2.Energy and Retrofitting Services Providers** - ESCO	
Key activities	Training for staff and companies. Build an educational framework that will provide a qualification to the new generation of knowledge transfer professionals.	
Key resources	Create an operation pattern to narrow the gap of knowledge sharing among groups.	
Value Proposition	**Tools** KTF Tool (www.ee-wise.eu)	**Networks** http://www2.schneider-electric.com/sites/corporate/en/products-services/training/energy-university/energy-university.page http://www.socialhousingaction.com
	Tips for Effective Knowledge transfer - Material should be clear and easy to be adopted by the members. - A visual explanation of how the EE system works and what is installed is necessary. - Educational Game tools are among the favourite choice for this knowledge transfer, so software developers need to get involved. - Solution designer have to use videos apart from the e-material to disseminate EE building components and systems. - Experimental building projects have a lot of useful demonstration material for EE training. - Actors involved in an experimental building, have to allow visitors for a living demonstration in order to maximise the impact of the training experience and assist in connecting EE directly to the market. - Experimental buildings have to be updated by collaborating with solutions designers to test their EE measures.	**Best Practices** Schneider Electric- Energy University is a free online, educational resource, offering vendor-neutral courses on energy efficiency topics to help the user identify, implement, and monitor efficiency improvements within an organization. Social Housing Action to Reduce Energy Consumption is an initiative consisting of forums that were set up for each of the 8 countries involved; training sessions took place, involving 1000 participants, mainly residents, but also energy experts, building managers, housing funds, local authorities, teachers and architecture students.

Customer Relationship	Webinars, web meetings, online conferences Long-term strong relationship (personal and automated) Databanks
Channels	- Educational Material, - Simulation Solutions, - Videos, - Leaflets with instructions, - Brochures with simple drawings
Customer Segments	**1. Public Bodies & Finance** - Public Administration **2. Knowledge and Products Providers** - Installer **3. Energy and Retrofitting Services Providers** - Architect & Engineer

A5. Training Architects & Engineers in Retrofitting Technologies		
Key partners	**1.Public Bodies & Finance** - Public Administration - Government **2.Knowledge and Products Providers** - Technical Solutions Developer - R&D	
Key activities	- Implement higher level of education in retrofitting Technologies for construction professionals. - Increase or adopt Curriculum for Bachelor or Master Degrees.	
Key resources	- New courses at universities or revising curriculum for bachelor and master Degree to improve knowledge transfer for Architects and Engineers. Introduce Architects and Engineers to experimental buildings and demonstrative videos of new technologies.	
Value Proposition	**Tools** KTF Tool (ee-wise.eu)	**Networks** www2.schneider-electric.com/sites/corporate/en/products-services/training/energy-university/energy-university.page http://www.youtube.com/watch?v=chl5_z-gkWg
	Tips for Effective Knowledge transfer - Keep always a visual explanation of how the EE system works and is installed. - Notice that simulation tools are the favourite choice for this Knowledge, so software developers need to get involved. - Use videos apart for the e-material to disseminate EE building components and systems if you are a solutions designer. - Experimental building projects have a lot of useful demonstration material for EE training. - If you are related to an experimental building, allow visitors for a living demonstration in order to produce impulse the training experience and assist connecting EE directly to the market. - Keep the experimental building updated by collaborating with	**Best Practices** - Schneider Electric- Energy University- the Energy University is a free online educational resource, offering vendor-neutral courses on energy efficiency topics to help the user identify, implement, and monitor efficiency improvements within an organization. http://www2.schneider-electric.com/sites/corporate/en/products-services/training/energy-university/energy-university.page - Some more examples can be taken from the Project BUILD UP Skills Malta [http://www.buildupskillsmalta.com/]

	solutions designers to test their EE measures. - Short-courses together with other informal learning events such as seminars and workshops would serve to provide further educational opportunities.	
Customer Relationship	Long-term deep relationship (Customer contact) Automated Systems (Newsletter, Webinars, Web Meetings, Online Conferences, Simulation) e-learning courses (synchronous, asynchronous)	
Channels	Videos, interactive presentations in dissemination events and experimental building visits.	
Customer Segments	**2.Energy and Retrofitting Services Providers** - Architect & Engineer	

B2. Intra-Academic Interaction		
Key partners	**1.Knowledge and Products Providers** - R&D	
Key activities	- Movement of academic staff between R&D institutions - Creation of knowledge banks, - Setting up of online forums, - Organization of brokerage events for creating collaborative joint research activities on specific retrofitting topics.	
Key resources	Guidelines for knowledge providers to disseminate and to make available to the rest of the academic and research community the outcomes of the research. The guidelines will be designed to be implemented in different type of activities such as: videos, podcasts, Forums, Webinars.	
Value Proposition	**Tools** KTF Tool (ee-wise.eu)	**Networks** www.proyectoedea.com/en/ www.enea.it http://www.youtube.com/watch?v=t5Dm6Dxn6B4
	Tips for Effective Knowledge transfer - Create a Database with all the already developed EE solutions - Create an open Calendar with all EE events which can be updated from all the involved agents - Keep always a visual explanation of how the EE system works and is installed. - Use videos apart for the e-material to disseminate EE building components and systems if you are a solutions designer. - Experimental building projects have a lot of useful demonstration material for EE training. - If you are related to an experimental building, allow visitors for a living demonstration in order to produce impulse the training experience and assist connecting EE directly to the market. - Keep the experimental building updated by collaborating with solutions designers to test their EE measures.	**Best Practices** EDEA, ENEA
Customer Relationship	Active Relationship (Personal Contact) (Seminars, academic meetings) Online Contact (Video In Learning Courses, Podcast (audio lectures), Webinars, Web	

	Meetings, Online conferences)
Channels	Videos, Presentations on the topic, Samples, Audio lectures.
Customer Segments	**1.Public Bodies & Finance** - Public Administration - Government

C3. Working in Response to Market Trends		
Key partners	**1. Knowledge and Products Providers** - Technical Solutions Developer - R&D	
Key activities	Modifications and improvements to the innovation that are resulting from a change originating in response to market feedback Form academic-industry collaborations to improve the effectiveness of the innovation process.	
Key resources	Guidelines for knowledge providers to effectively transfer their technology and knowledge. These guidelines may take the form of: - videos in which the problems and solutions can be demonstrated, - Forums where the exchange of problems and solutions can be debated, - Webinars for the Academic Industry cooperation. - Tools to allow the R&D society to understand the needs of the traditional workforce and the end users.	
Value Proposition	**Tools** KTF Tool (ee-wise.eu)	**Networks** www.construction21.eu www.elih-med.eu/Layout/elih-med/
	Tips for Effective Knowledge transfer - Create a mechanism (forum) that will relay the R&D institutes with the market needs. - If you are involved in an experimental building, allow visitors for a living demonstration in order to maximise the training experience and assist in connecting EE directly to the market. - Keep the experimental building updated by collaborating with solutions designers to test their EE measures.	**Best Practices** - Construction21 Europe. The European platform for green building practitioners - ELIH-MED aims to test and identify feasible cost-effective technical solutions and innovative financial mechanisms. It does so through large scale pilot actions backed by the ERDF (European Regional Development Fund).
Customer Relationship	Close contact through online resources (such as social networking sites, etc.) Automated contact through (CRM, mail, newsletter, etc.) Personal Contact through support agents.	
Channels	Videos, community portals, Webinars, web meetings, online conferences Presentations on the topic, Samples, A platform on which to create blog-based learning.	
Customer Segments	**1.Public Bodies & Finance** - Public Administration - Government **2.Knowledge and Products Providers** - Installers **3.Energy and Retrofitting Services Providers** - Architect & Engineer **4.Demand** -Build Manager - Occupant	

D1. Public R&D Initiatives & Innovation Funding		
Key partners	**1. Knowledge products & services** - Software developers - Manufacturers - R&D **2. Energy Retrofitting sector** - Architects & Engineer **3. Energy Providers** - Renewable Energy	
Key activities	Master plans involving public and private actors in R&D activity. Recommendations to have both EU wide and R&D plans that support R&D activities	
Key resources	Videos of economist that easily explain the existing financial tools, Web tools forums, Webinars	
Value Proposition	**Tools** KTF Tool (ee-wise.eu)	**Networks** http://www.kickstarter.com/ www.marie-medstrategic.eu/en/success-stories-or-best-practices/best-practices.html
	Tips for Effective Knowledge transfer - Create publicly funded websites in which new ideas can be funded either by financial institutes or VCs. - Create forums where new engineers will present new ideas and financial institutions will finance them.	**Best Practices** MARIE PROJECT - development of model "solutions" regarding policy, funding mechanisms, products & services.
Customer Relationship	Long-term strong relationship (personal and automated) Automated systems (databanks)	
Channels	Leaflets. Webinars, web meetings, online conferences. Communication Tools. Video in learning courses. Basic start materials about bank products.	
Customer Segments	**1. Knowledge products & services** - Installers **2. Demand** Occupants	

E2. Criteria for R&D Project Evaluation		
Key partners	**1. Knowledge products & services** - R&D	
Key activities	- Involve the end users in the evaluation of research projects. - Including project evaluation criteria that will rate the final result.	
Key resources	Videos of economist that easily explain the existing financial tools, Web tools Forums, Webinars	
Value Proposition	**Tools eg KTF Tool (ee-wise.eu)** KTF	**Networks** http://www.elih-med.eu/Layout/elih-med/ http://fund.corpbank.bg/ https://www.youtube.com/watch?v=sq_mndyvy6a
	Tips for Effective Knowledge transfer - Create an easily accessible FAQ Forum involving all actors of the EE	**Best Practices** - Programme for energy-efficient retrofitting of Bulgarian Households;

	Retrofitting value chain. - Use videos apart for the e-material to disseminate EE building components and systems if you are a solutions designer. - Present to the end user the needs of the new projects.	- Energy Efficiency in Low Income Housing in the Mediterranean.
Customer Relationship	Automated Systems (Databanks) Active Relationship (Personal Contact) (customer feedback) Blog-based learning,community Online forums Simulation	
Channels	- Government - Simulation solutions, - social networking sites - Transparent information how to deal with the projects, how to search for the information in the database, - Platform for the forums	
Customer Segments	**1. Public Bodies & Finances** - Public Administration - Government **2. Demand** - Building Managers	

3.4. Analysis of Knowledge Transfer Needs Related to Knowledge Sharing

Szulanski (1996)[11] found that when the relationship between the source of knowledge and the recipient was distant or problematic, knowledge transfer was more difficult. The ability to identify and share knowledge is an important factor for market competitive advantage.

The three factors that Szulanski found to be the greatest impediments to knowledge sharing are: causal ambiguity of the knowledge itself, lack of absorptive capacity of the recipient, and an arduous relationship between the source and recipient. These impediments are all knowledge-related barriers. In contrast, conventional wisdom on why knowledge is hard to transfer within firms has focused almost exclusively on motivational barriers such as interdivisional jealousy, lack of incentives, lack of buy-in, resistance to change, lack of commitment, etc. The results of this study indicate that the difficulty firms have in transferring knowledge may be less because organizations do not want to learn and more because they do not know how to. Therefore, firms may want to consider devoting resources to develop the learning capacities of organizational units, fostering closer relationships between units, and systematically understanding and communicating practices.

Using this principle, knowledge sharing within the ee-WiSE project refers to exposing of generated or existing knowledge to others in order to improve skills and ideas about energy efficiency retrofitting. In the framework of addressing the above idea that knowledge is not shared effectively because organisations do not know how to do that, ee-WiSE had developed knowledge transfer guidelines which are synopsized on the needs tables analysed based on the Business Model Canvas.

[11] SZULANSKI, G. (1996): "Exploring Internal Stickiness: Impediments to the Transfer of Best Practice within the Firm", Strategic Management Journal, Vol. 17 (Special Issue), pp. 27-43.

The analysis includes the methods for sharing the knowledge: requiring face-to-face contact, opportunities for experiential learning, communication channels, innovative methods, etc. In all instances, the study of the needs for knowledge sharing takes into account the various forms of sharing mechanisms that are best suited for interpretation and adaptation by the value chain agent who is receiving the information.

<table>
<tr><th colspan="3">C1. Applicability to the End User</th></tr>
<tr><td>Key partners</td><td colspan="2">1.Knowledge and Products Providers
- Installer
- Manufacturer
2.Public Bodies & Finance
- Pub. A
3.Demand
- Occupants</td></tr>
<tr><td>Key activities</td><td colspan="2">Increase interaction between scientists and the agents at the end of the value chain.
Create new communication channels between agents to improve EE solutions with their feedback</td></tr>
<tr><td>Key resources</td><td colspan="2">Improve communication skills in scientists and ensure recognition of communication efforts.</td></tr>
<tr><td rowspan="2">Value Proposition</td><td>Tools

KTF Tool (ee-wise.eu)</td><td>Networks
http://bookshop.europa.eu/en/energy-cbWmMKABstNjAAAAEjNZEY4e5L/</td></tr>
<tr><td>Tips for Effective Knowledge transfer
- Use simple questionnaires with scale question type.
- If you are an occupant, make sure the feedback provided is related to the analysed technology.
- If you are a Manufacturer or Installer, you can provide valuable feedback to scientists regarding the technology production and implementations processes.
- If you are a Public Admin, your feedback is important regarding the chances the EE technology has to success in society and to receive an investment incentive.
- Public Admin, need to moderate the communication channels and foster scientist to participate on them.
- Also, Public Admin can gather this feedback, and translate it into summarized guidelines for scientist to improve communication skills.</td><td>Best Practices
Online European bookshop where the research results are exposed in a friendly way.</td></tr>
<tr><td>Customer Relationship</td><td colspan="2">Automated Systems (questionnaires, customer feedback)
Online Contact (Webinars, web meetings, online conferences, Online Forums, Communication Tools)</td></tr>
<tr><td>Channels</td><td colspan="2">Online events, Forums or any communication tool where scientists and end-users are able to interact</td></tr>
<tr><td>Customer Segments</td><td colspan="2">1.Knowledge and Products Providers
- R&D
- Technical Solutions Developer</td></tr>
</table>

<table>
<tr><th colspan="3">C2. Real-life evaluation of research results</th></tr>
<tr><td>Key partners</td><td colspan="2">1.Public Bodies & Finance
- Public Administration
- Finance
2.Knowledge and Products Providers
- Technical Solutions Developer
- R&D
- Manufacturer
3.Quality Assurance
- Life Cycle Assessment
- Certificate Body
- Patent Office</td></tr>
<tr><td>Key activities</td><td colspan="2">Exposing the advances of the research activity to the end users through a stock of buildings that can be used for real-life testing.</td></tr>
<tr><td>Key resources</td><td colspan="2">Supply of real life cases to allow evaluation of research results:
- Real-life experimental buildings: from experimental building projects.
- Public buildings: belonging to the Public Administration.
- Residential buildings: belonging to owners that have been encouraged through subsidies and reduced rates.
Comparison of the scientific feedback obtained with the owners' impressions and presented to the scientific community and general society.</td></tr>
<tr><td rowspan="2">Value Proposition</td><td>Tools

KTF Tool (ee-wise.eu)</td><td>Networks
http://enercitee.eu/Sub-Projects/RIEEB---Regional-Impact-with-Energy-Efficient-Buildings,57/
http://www.renov.proyectoedea.com/es/content/objetivos-0
www.esesh.eu
www.construction21.eu
www.cicstart.org
www.elih-med.eu/Layout/elih-med/
www.iee-square.eu;www.eaci-projects.eu/iee/page/Page.jsp?op=project_detail&prid=1738</td></tr>
<tr><td>Tips for Effective Knowledge transfer

- Public Admin bodies should develop a program to promote collaboration between house-owners and solutions designers, considering also support from financial agents.
- Quality Assurance agents, provide assistance for certificates in the real-life testing approach.
- Solutions designers are to develop easy understandable material that explains the EE system and its monitoring process.
- Create methods to gather the users' experiences and translate them into technical input to improve the technology.
- Experimental building projects and other existing buildings should be considered for real-life evaluation.</td><td>Best Practices
- Practical guidelines and policy recommendations produced within EnercitEE will provide valuable assistance for European regions aiming to improve their energy performance and policies.
- The eSESH project aims at helping Europe to meet emission targets by achieving a significant reduction of energy consumption in European social housing.
- Construction21 Europe. The European platform for green building practitioners
- CIC Start Online is a collaborative effort between universities for academic consultancy on sustainable building design and refurbishment.
- ELIH-MED aims to test and identify feasible cost-effective technical solutions and innovative financial mechanisms. It does so through large scale pilot actions backed by the ERDF (European Regional Development Fund).
- The SQUARE project aims to assure energy efficient retrofitting of multifamily housing with good indoor environment, in a systematic and</td></tr>
</table>

		controlled way.
Customer Relationship	Active Relationship (Personal Contact) (meetings) Online Contact (Communication Tools, Blog-based learning, social networking sites, community portals, Webinars, web meetings, online conferences)	
Channels	Guidelines, community websites, and online events.	
Customer Segments	**1.Public Bodies & Finance** - Public Administration **2.Knowledge and Products Providers** - Technical Solutions Developer - R&D - Installer - Manufacturer **3.Energy and Retrofitting Services Providers** - Architect & Engineer **4.Quality Assurance** - Life Cycle Assessment - Certificate Body **5.Demand** - Occupant - Building Manager	

C4. Results Focusing on Practical Benefits		
Key partners	**1.Knowledge and Products Providers** - Technical Solutions Developer - R&D - Manufactures **2.Energy Providers** - Renewable Energy **3.Energy and Retrofitting Services Providers** - ESCO	
Key activities	- Readily available information from product and technology data sheets. - Knowledge sharing events (encouraged by admin) where the owners and supporting agents of the new retrofit technologies will have the opportunity to present the results of the new technology advances to the rest of the value chain.	
Key resources	- Experimental Building Projects that will allow the retrofit technologies providers to obtain the practical benefit input from the building testing and expose it. - Collection of energy performance data gathered from owners' impressions to be defined as an essential duty after a technology is installed, both in terms of economic savings and comfort. - ESCOs can conduct the exposition of owners' impressions on their own, while additionally they can follow a dual team approach presentation between the owner and the solution provider.	
Value Proposition	**Tools** KTF Tool (ee-wise.eu)	**Networks** http://www.ase.org/blog/top-10-energy-efficiency-smartphone-apps https://www.gov.uk/government/news/save-energy-cash-this-winter http://www.smarthome.com/forum/default.asp http://blog.togetherwesave.com/ www.maimona.org www.elih-med.eu/Layout/elih-med/
	Tips for Effective Knowledge transfer - If you are a Public Admin, foster opinion exchange in community websites between end-users regarding benefits on EE R&D results experienced. End-users listen to other end-users!	**Best Practices** - Maimona Foundation aims to support the development of business plans and strategic plans in all project types. It assists in finding partners for projects as well as relevant

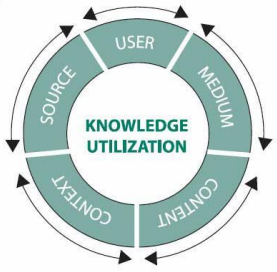
	- Translate your energy or CO2 saving results, and include economical savings and comfort level information. - Include images with the information you provide. - Develop a "social" version of your information sheet avoiding technical language and including more interesting parameters for society.	information to move the project forward together with risk capital procurement and financial resources sourcing. - ELIH-MED aims to test and identify feasible cost-effective technical solutions and innovative financial mechanisms. It does so through large scale pilot actions backed by the ERDF (European Regional Development Fund).
Customer Relationship	Long-term relationship (Personal Contact) Online Contact (Customer feedback)	
Channels	Forums and community portals are the most familiar tools for end-users, but e-material is also welcomed Video In Learning Courses, Podcast (audio lectures), Webinars, Web Meetings, Online conferences	
Customer Segments	**1.Knowledge and Products Providers** - Installer **2.Energy and Retrofitting Services Providers** - Architect & Engineer **3.Demand** - Occupant - Building Manager	

3.5. Analysis of Knowledge Transfer Needs Related to Knowledge Dissemination

Knowledge dissemination is defined as the communication of research outputs to potential users with the expectation that the knowledge will be used conceptually (for learning, enlightenment, or the acquisition of new perspectives or attitudes) or instrumentally (in the form of modified or new practices). Knowledge dissemination is a crucial part of knowledge management since it ensures that knowledge is made available to those who need it.

The essential factors for effective dissemination that lead to eventual knowledge utilisation are:

- USER: establishing the appropriate target group
- MEDIUM: means via which information is to be disseminated
- CONTENT: knowledge base that is to be disseminated
- CONTEXT: presentation of the knowledge in the way that is most meaningful to the user
- SOURCE: the knowledge provider



Knowledge utilisation as a result of knowledge dissemination

Effective dissemination depends on other factors includingoptimum budget allocation, society, culture, etc. Various analytical tools exist to gauge the effectiveness of the knowledge dissemination activity,

e.g. questionnaires. A guide to creating an effective knowledge dissemination plan defines ten main essential elements[12]:

1. **Goals:** Determine and document the goals of your dissemination effort for your proposed project.
2. **Objectives**: Associate each goal with one or more objectives that clarifies what you are trying to accomplish through your dissemination activities.
3. **Users:** Describe the scope and characteristics of the "potential users" that your dissemination activities are designed to reach for each of your objectives.
4. **Content:** Identify, at least, the basic elements of the projected content you have to disseminate to each of the potential user groups identified.
5. **Source(s):** Identify the primary source or sources that each potential user group is already tied into or most respects as an information source. Consider ways to partner with these sources in your dissemination efforts.
6. **Medium:** Describe the medium or media through which the content of your message can best be best delivered to your potential users and describe the capabilities and resources that will be required of potential users to access the content for each medium to be used.
7. **Success:** Describe how you will know if your dissemination activities have been successful. If data is to be gathered, describe how, when, and who will gather it.
8. **Access:** Describe how you will promote access to your information and how you will archive information that may be requested at a later date. Consider that most people will use your project-related information when they perceive a need for it – not necessarily when you have completed your research project.
9. **Availability:** Identify strategies for promoting awareness of the availability of your research-based information and the availability of alternate available formats.
10. **Barriers:** Identify potential barriers that may interfere with the targeted users' access or utilization of your information and develop actions to reduce these barriers.

The added value of knowledge dissemination is that its effect will increase awareness on a particular subject and allow for informed choices from amongst a group of alternatives. Dissemination does not include direct feedback from the audience but is a one-way flow of knowledge from the knowledge source to the potential market.

A2. End user Take Up of Research Results	
Key partners	**1.Knowledge Product Providers** - Software Developers - Technical Solutions - Manufactures - Installers - R&D **2.Energy Providers** - Renewable Energy **3.Energy Retrofitting Services** - ESCO - A&E
Key activities	End-User mobilization Events, Training & Education Actions, Model (Demo) Solutions, or Web / Social Media
Key resources	The specific knowledge transfer actions aim to inform building occupants and owners about the latest technological solutions and trends in the EE retro-fitting market. Real demonstration projects can also be designed and implemented based on viable business models where the investment necessary is set against the future economic as well as

[12] Verite' Dissemination Planning Guide http://www.verite.org

	environmental benefits	
Value Proposition	**Tools** KTF Tool (ee-wise.eu)	**Networks** http://energy.gov/articles/energy-saver-101-infographic-home-heating http://www.ngridenergyworld.com/efficiency/t_book.html http://www.youtube.com/watch?v=uSL5QmRKyOA
	Tips for Effective Knowledge transfer - Present learning material in a simple and concise manner, avoiding scientific language and technical jargon - Make use of EC guidelines for research results dissemination for valuable feedback / ideas - Employ Web conferencing / Webinar learning tools which offer options for online or offline (pre-recorded events) communication / training in remote locations - Use simulation tools as another preferred option which can be produced in all fields through computer games, role-plays, or building models - Create an immersive learning experience through simulation tools which are suitable for all people with different cultural backgrounds	**Best Practices** - ECHO ACTION - to encourage active involvement of end-users, local economic actors, financial institutes, and local energy providers to facilitate the implementation of local energy plans. - Social Housing Action - to reduce energy consumption through good practices sharing on retrofitting technologies that address energy concerns and changes in behaviour - - Take your energy back - to mobilize end-users through a Smart-e Buildings campaign (an interactive web portal linked to the main social networks like Twitter and Facebook).
Customer Relationship	Automated Contact (Newsletter) Online Contact (Webinars, web meetings, online conferences, Simulations, Blog- based learning) Active Relationship (Personal Contact)	
Channels	Educational Material , Simulation Solutions, Leaflets , EE Technologies, Building Regulations and Certification	
Customer Segments	1.Demand - Building Managers - Occupants	

A4. Managing Intellectual Property	
Key partners	**1.Knowledge Product Providers** - Technical Solutions - Manufacturers - R&D
Key activities	- Re-evaluate the question of a single European ownership model especially for publicly funded research. - Initiatives originating from third-party organizations providing consultancy on knowledge sharing would be of further benefit to the business society. - Intellectual property training. Access to online journals some of which are open access and free.
Key resources	The intellectual property of a company is one of the most valuable assets which can be used to fund new R&D projects, thus this KT solution is designed to make the business society aware of the available tools to manage IP rights in order to achieve innovation .

Value Proposition	**Tools** KTF Tool (ee-wise.eu)	**Networks** http://www.escolimburg2020.be/ http://www.marie-medstrategic.eu/en.html https://www.youtube.com/watch?v=YR6ZGzNnemA https://www.youtube.com/watch?v=R2j-2HMTpJI
	Tips for Effective Knowledge transfer - Create the appropriate material that disseminates the Intellectual property procedures	**Best Practices** - ESCOLIMBURG2020- the project aims to accelerate and upscale the concrete implementation of energy efficiency and renewable energy measures in the public building stock by making use of an ESCO-model, relieving the local authorities from complex investment processes. - MARIE- to develop and adopt new regulatory requirements and new institutional tools to achieve the goals established by the new European Directive (EPBD); find new financial mechanisms that can be used to stimulate the thermal rehabilitation of buildings
Customer Relationship	Long-term relationship Automated Systems (Databanks) Automated Communication (Blog-based learning, Social networking sites, Community portals, Webinars, web meetings, online conferences, Mobile learning)	
Channels	Forums or trainings where experts from industry will discuss (explain) how Intellectual property can help the promotion and dissemination of new products and at the same time protect the investment.	
Customer Segments	**1.Public Bodies Finance** - Public Administration - Gov	

B1. Building Consortia & Energy Efficiency Networks		
Key partners	**1. Knowledge products & services:** - Software developers - Technical solutions - Manufacturers - R&D - Climate **2. Quality Assurance** - Patent Offices - Life Cycle Assessment	
Key activities	- Formation of consortia and energy efficiency networks - Information transfer through media exposure, organization of exhibitions, documentation archiving, demonstration projects, training plans, networking - Creation of a EU-wide recognized standardization body.	
Key resources	Green Touch™: Basic Communications Systems The European platform for green building practitioners Energised communities	
Value Proposition	**Tools** KTF Tool (ee-wise.eu)	**Networks** https://www.youtube.com/watch?v=yfsDetHMiow https://www.youtube.com/watch?v=1WjBilqyTxU http://www.youtube.com/watch?v=cN6YrrqqLIM
	Tips for Effective Knowledge transfer - Should be created open discussions with moderators that will advise , learn how to deal with the topics - Keep always a visual explanation of how	**Best Practices** The best method to start a cluster initiative online. The easiest way would be putting together other existing networks in each Mediterranean country. The networks

	the EE system works and is installed. - Notice that even though the simulation tools are not the favourite choice for this Knowledge, a very fast simulated outcome on the results of EE will create lot of advantages	related to each type of agent should be considered. The tool should establish a connection with other networks in the sector related to daily building practice and with innovation in EE retrofitting. Should provide K sharing opportunities online, such as forums, debates, etc, or a way to contact each other or publishing news.
Customer Relationship	Online Contact (Webinars, web meetings, online conferences Blog-based learning, social networking sites, community portals) Active Relationship (Personal Contact) (meetings)	
Channels	Presentations Podcasts Platform to create the forums and platform to create blogs	
Customer Segments	**1. Public Bodies & Finance** - Public Administration - Standardization **2. Knowledge products & services:** - Installers **3. Energy providers:** - Renewable energy - Energy distributors - Grid operators **4. Energy & Retrofitting services** - ESCO´s - Architects and engineers - Audit firms	

B3. Clustering of Retrofit Market Solutions		
Key partners	**1. Knowledge and Products Providers** - Technical Solutions Developer - Manufacturer - R&D	
Key activities	Create regional networking of companies working in retrofitting innovation.	
Key resources	Guidelines to be implemented in different type of activities such as: videos podcasts forums and training material regarding the use of the proposed solution.	
Value Proposition	**Tools** KTF Tool (ee-wise.eu)	**Networks** ww.powerhouseeurope.eu/nc/cases_resources/case_studies/single_view/?tx_phecasestudies_pi3%5Bid%5D=106
	Tips for Effective Knowledge transfer - Keep always a visual explanation of how the EE system works and is installed. - Notice that simulation tools are the favourite choice for this Knowledge, so software developers need to get involved. - Use videos apart for the e-material to disseminate EE building components and systems if you are a solutions designer. - Experimental building projects have a lot of useful demonstration material for EE training. - If you are related to an	**Best Practices** - Case study: AID system for Thermal Refurbishment of Social Housing Stock in Champagne Ardennes Region- Identifications of needs; Implementation of the partnership, Support to project managers, Financial Engineering, Funding and monitoring of project. - Case Study: Arte Genova Pilot Via Sertoli,9- Shelter Project: maintain the thermal comfort conditions inside the units; reduce heat loss; assess, the energy efficiency of each dwelling.

	experimental building, allow visitors for a living demonstration in order to produce impulse the training experience and assist connecting EE directly to the market. - Keep the experimental building updated by collaborating with solutions designers to test their EE measures.	
Customer Relationship	Online and Automated Systems (Video in learning courses, Webinars, web meetings, online conferences, Online forums) Active Relationship (Personal Contact)	
Channels	Material required for this issue are video clips about retrofitting, presentations bout how society deals with energy efficiency. Topics that cover the needs the retrofit.	
Customer Segments	**1.Public Bodies & Finance** - Public Administration - Government **2.Knowledge and Products Providers** - Installer **3.Demand** - Occupant - Building Manager **4.Energy Providers** - Renewable Energy - Energy Distributor	

B4. Connecting Commercial Advice to EPBD Activity		
Key partners	**1. Energy & Retrofitting services** - ESCO´s - Architects and engineers - Audit firms **2. Demand** - Occupants	
Key activities	Commercial advice in line with national EPBD requirements Clustering framework Offering the relevant and complete information to the consumers	
Key resources		
Value Proposition	**Tools eg KTF Tool (ee-wise.eu)** KTF	**Networks** http://www.youtube.com/watch?v=GHk2Tk9E6AI http://www.building.co.uk/is-the-government-ready-for-the-epbd?/5036193.articleB4
	Tips for Effective Knowledge transfer - Use Podcasts as a less expensive tool to offer a mobile, interesting and convenient way for accessing information / training material - Employ Web conferencing / Webinar learning tools which offer options for online or offline (pre-recorded events) communication / training in remote locations - Include Online Forums and Podcasts in your "toolbox" as two other popular options - Please bear in mind that the audience is technically competent so scientific jargon maybe used in the learning material	**Best Practices** - ENEA - Entrusting the role of providing commercial advice in line with national EPBD requirements to competent National Agencies - FOREST - Carrying out networking and clustering actions - PadovaFIT! - Offering complete information to the consumers through pilot retrofit projects

Customer Relationship	Active Relationship (Personal Contact) (meetings) Online Contact (Webinars, Web Meeting, Online Conferences, Online forums. Podcasts (audio lectures)
Channels	Educational Material, Audio Lectures, Brochures, Leaflets, Data concerning EE Technologies and Building Regulations and Certification
Customer Segments	**1. Public Bodies & Finances:** - Public Administration - Government - Standardization **2. Knowledge products & services:** - Software developers - Technical solutions - Installers **3. Energy & Retrofitting services** - ESCO´s - Architects and engineers - Audit firms

D2. Support Industry in R&D Take-Up		
Key partners	**1.Knowledge Product Providers** - Technical Solutions - Manufactures - Installers **2.Energy Providers** - Renewable Energy **3.Energy Retrofitting Services** - ESCO **4.Quality Assurance** - Certificate Entries	
Key activities	- The development of appropriate financial instruments to promote the installation of energy efficient housing and retrofit technologies - Control of the eligibility to make use of the financial benefits in each country could be done through a measurement of the building energy efficiency level - Set up of beneficial grants, green loans and tax revisions (value added tax, property tax, income tax).	
Key resources	As many research efforts are frustrated and remains ideas or theoretical data that can't be developed into products, the aim of the KT solution is foster the financial support to the industry in order to market up take the scientific results into products.	
Value Proposition	**Tools** KTF Tool (ee-wise.eu)	**Networks** http://www.eaci-projects.eu/iee/page/Page.jsp?op=project_detail&prid=1519 https://www.youtube.com/watch?v=Ax0oooYAQLc https://www.youtube.com/watch?v=K7y50oT7Rio#start=0:00;end=6:16;cycles=-1;autoreplay=false;showoptions=false
	Tips for Effective Knowledge transfer - Financial Institutions has to communicate the new financial products - Financial institutes has to be close to the EE Market and Industry - Development of appropriate financial instruments to foster cooperation between industry and R&D entities. - These instruments can for example include the setting up of grants for	**Best Practices** Educa-RUE, through a number of interconnected actions, will develop an optimal process to be applied and replicated at local level. The project will develop actions for the qualification of the technicians and certifiers which will have a key role in the implementation of the Directive on local building. Educa-RUE will study possible improvements in the applicative procedures of the Directive, supporting and enhancing specific financial tools and procedural incentives to promote the more efficient use of energy in building As the project will act upon a

	promotion of innovative products, tax revisions on items related to innovation sourcing (e.g. attendance to expo fairs, seminars, and patent fees). - To control financial benefits, it might be appropriate to install an associated quality assurance scheme to ensure the actual diffusion and implementation of the retrofit.	range of problem areas such as legislation, certification, education, economic and financial issues, training, information and dissemination, the first direct beneficiaries of the project results will be local policy makers. The involvement of local government players is ensured by the composition of the partnership belonging to 4 EU countries and the attention focused on the issue of energy efficiency at local level. The Local levels will act, where existing, through the collaboration of Local energy agencies, ensuring technical support an eventually training capacity.
Customer Relationship	Long-term deep relationship Active Relationship (Personal Contact) Online Contact (Webinars , Web meetings, Online conferences, Communication Tools, Blog – based learning, social networking sites, Community portals)	
Channels	Brochures how to interact with financial institutions, Leaflets about financial products	
Customer Segments	**1.Public Bodies & Finance** - Financial Agents - Gov **2.Demand** - Occupants	

D3. Support Occupant in Retrofit Take-Up	
Key partners	**1. Public Bodies & Finance** - Pub A - Gov. **2.Quality Assurance** - Certificate
Key activities	- The development of appropriate financial instruments to promote the installation of energy efficient housing and retrofit technologies - Control of the eligibility to make use of the financial benefits in each country could be done through a measurement of the building energy efficiency level - Set up of beneficial grants, green loans and tax revisions (value added tax, property tax, income tax).
Key resources	Create forums or trainings where experts from R&D, Finance institutions will discuss (explain) the need, opportunities to invest in EE retrofitting technology. Financial institutions should create new products optimal for different occupants, and also government can reduce taxation in energy efficiency buildings

<table>
<tr><td rowspan="2">Value Proposition</td><td>Tools

KTF Tool (ee-wise.eu)</td><td>Networks
- www.warmupnorth.com/
- www.eaci-projects.eu/iee/page/Page.jsp?op=project_detail&prid=2533
- http://www.youtube.com/watch?v=P9I8zingLjE
- http://www.youtube.com/watch?v=W_YIrxBHukM</td></tr>
<tr><td>Tips for Effective Knowledge transfer
- The produced material that promotes the financial products has to be in a understandable form the Occupants perspective.

- The Financial products has to be transparent
- Notice that simulation / games tools are not among the favorite choice for this Knowledge, but it can be easy for the occupants to understand the Pros /Cons of the EE retrofitting technology
- Use videos apart for the e-material to disseminate EE building components and systems if you are a solutions designer.
- Experimental building projects have a lot of useful demonstration material for EE training.
- If you are related to an experimental building, allow visitors for a living demonstration in order to produce impulse the training experience and assist connecting EE directly to the market</td><td>Best Practices
Newcastle City Council (NCC) is a signatory of the Covenant of Mayors since January 2008. Following the City Climate Change strategy and the Sustainable Energy Action plan (SEAP) both approved in October 2010, the Council is actively involved in developing and implementing actions to meet the SEAP targets. Technical assistance is provided for the delivery of a large scale, city wide, cross tenure housing retro fit program of energy efficiency and renewable measures. The investment and financing model is based on 10,000 to 15,000 homes to be retrofitted and will start with a first phase on targeting 5,000 homes over the 3-year project period. The investment scheme is based on the UK Green Deal and the project will set up a delivery body to carry out the retrofitting program. NCC is leading on this development work as a "pathfinder" for all the Local Authorities in the North East of England Region</td></tr>
<tr><td>Customer Relationship</td><td colspan="2">Online Contact (Communication Tools, Webinars, Web meetings, Online Conferences, Video in Learning Courses)
Active Relationship (Personal Contact)</td></tr>
<tr><td>Channels</td><td colspan="2">Information about how to interact with financial products</td></tr>
<tr><td>Customer Segments</td><td colspan="2">1.Public Bodies & Finance
- Financial Agents
2.Demand
- Occupants</td></tr>
</table>

<table>
<tr><th colspan="3">E1. EC Guidelines for R&D to Address End-User Knowledge Needs</th></tr>
<tr><td>Key partners</td><td colspan="2">1.Public Bodies & Finance
- Public Administration
- Government
2.Knowledge and Products Providers
- Technical Solutions Developer
- Software Developer
- Installer
- Manufacturer
3.Energy and Retrofitting Services Providers
- Architect & Engineer
- Audit
- ESCO
4.Quality Assurance
- Certificate Body
5.Demand
- Occupant
- Building Manager</td></tr>
<tr><td>Key activities</td><td colspan="2">- Professional knowledge brokers
- Knowledge transfer at a cluster level
- Clear definition of the end-user/target groups</td></tr>
<tr><td>Key resources</td><td colspan="2">- Model solutions for policy, funding mechanisms, products and services
- Common guidelines and policies to improve the competitiveness of innovative and sustainable models for housing that respond to the challenges of a growing population.
- Development of a common model/strategy for training, certification and knowledge dissemination.</td></tr>
<tr><td rowspan="2">Value Proposition</td><td>Tools

KTF Tool (ee-wise.eu)</td><td>Networks
http://www.marie-medstrategic.eu/en.html
http://www.irh-med.eu/
http://www.educarue.eu/</td></tr>
<tr><td>Tips for Effective Knowledge transfer
- Include references to the feedback received from users (public bodies, product / service providers, quality assurance, occupants) in the guidelines
- Provide direct audio or/and video connection between the trainers and the trainees
- Use Web conferencing / Webinar as another option
- Enable communication / training in remote locations through web conferencing events, meetings, workshops
- Provide either a recorded copy of the event, or a means for a subscriber to record the event.</td><td>Best Practices
- MARIE - Mediterranean Building Rethinking For Energy Efficiency Improvement. The mission of the MARIE project is to co-construct a strategy for energy efficiency in existing buildings in the Mediterranean region.
The main idea to replicate here is the development of a model “solution” regarding policy, funding mechanisms, products & services.
- IRH-Med - Innovative Residential Housing for the Mediterranean. The idea here is to develop common guidelines & policies to improve the competitiveness of innovative and sustainable models for housing that respond to the challenges of a growing population.
- Educa-RUE - Energy Efficiency Paths in Educational Buildings. The project will develop actions (legislation, certification, education, finance, training, information and dissemination) for the implementation of the Directive on local building. Again here the idea is to develop a common model/strategy, but Educa-RUE is more elaborate and addresses also training, certification and dissemination.</td></tr>
<tr><td>Customer Relationship</td><td colspan="2">Automated Systems (questionnaires, customer feedback)
Online Contact (Communication Tools, Webinars, web meetings, online conferences, e-books)</td></tr>
<tr><td>Channels</td><td colspan="2">EC guidelines on dissemination / exploitation of research project results in an appropriate format (webinars, online forums, blog based learning, e-book)</td></tr>
<tr><td>Customer Segments</td><td colspan="2">1. Knowledge and Products Providers
- R&D</td></tr>
</table>

3.6. Conclusion

On the basis of the information presented in the preceding tables, it appears that the needs for clustering EE retrofitting technologies, providing continuous training of both users and providers, and enhancing information sharing for both users and providers in the value chain are fundamental factors in improving knowledge transfer and reaching the EU targets for energy saving

4. PRACTICAL PROCEDURES, RECOMMENDATION, GUIDELINES PER THREE FOLD APPROACH FOR CROSS-SECTORIAL COOPERATION

With particular focus to Deliverable D6.3, ten knowledge transfer needs out of a total of eighteen have been selected as containing components affecting cross-sectorial interaction and shall be described in this document. The selected ten knowledge transfer needs have been split into the 3-fold approach as shown in Figure 8.

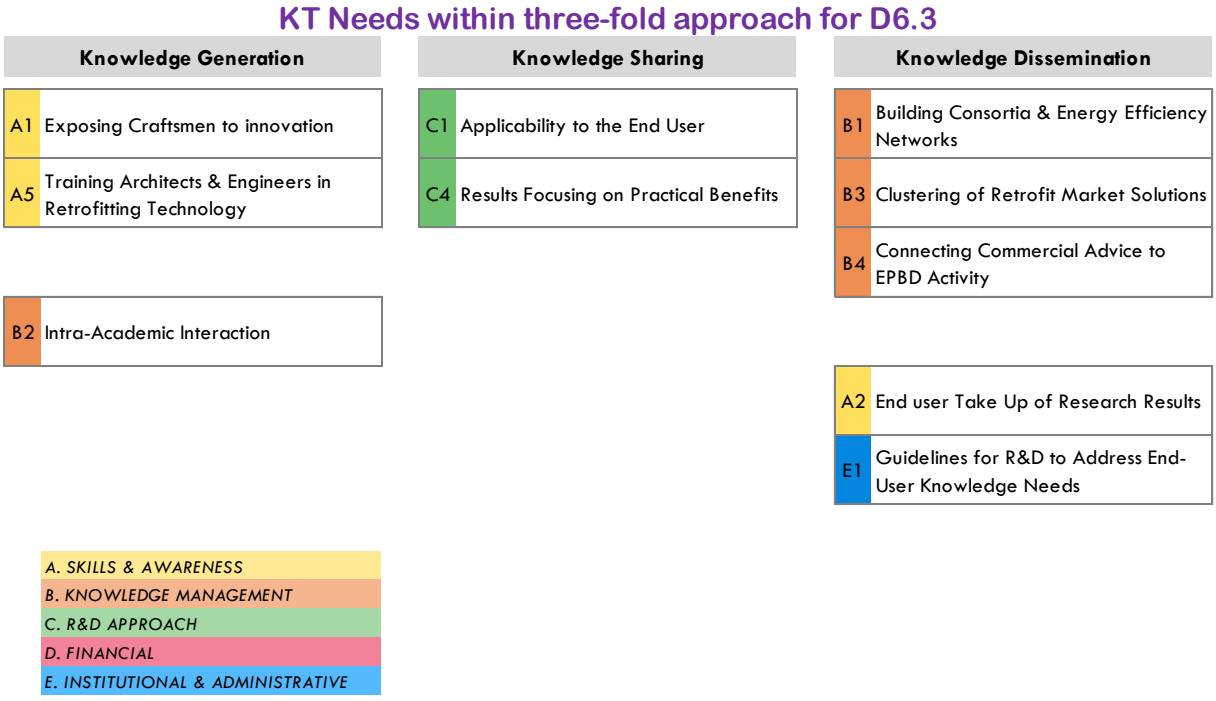


Figure 8: Knowledge Transfer Needs within the three-fold approach for *"Cross-Sectorial cooperation enhancement"*

4.1. The Cross-Sectorial Cooperation approach

The *Energy-Efficient Building Retrofitting* sector involves the participation of different agents that belong to different sectors at the same time. WP1, deliverable D1.1 "Methodological Framework Development" analyses the complete value chain agents based on the *EE Building Retrofitting Process*, from its beginning to its end. This analysis includes a description of the process and the groups of actors involved. As a result a concise classification and definition of the agents of the value chain is provided (see section 2.1). In a further analysis in deliverable D2.2 "Knowledge Transfer Flows Analysis Report", is also appreciated that the interaction between these agents, and the sector they belong to independently, is fundamental for knowledge transfer in a holistic approach of the sector (Figure 9). The flows are identified depending on their critical status towards the knowledge transfer in the value chain.

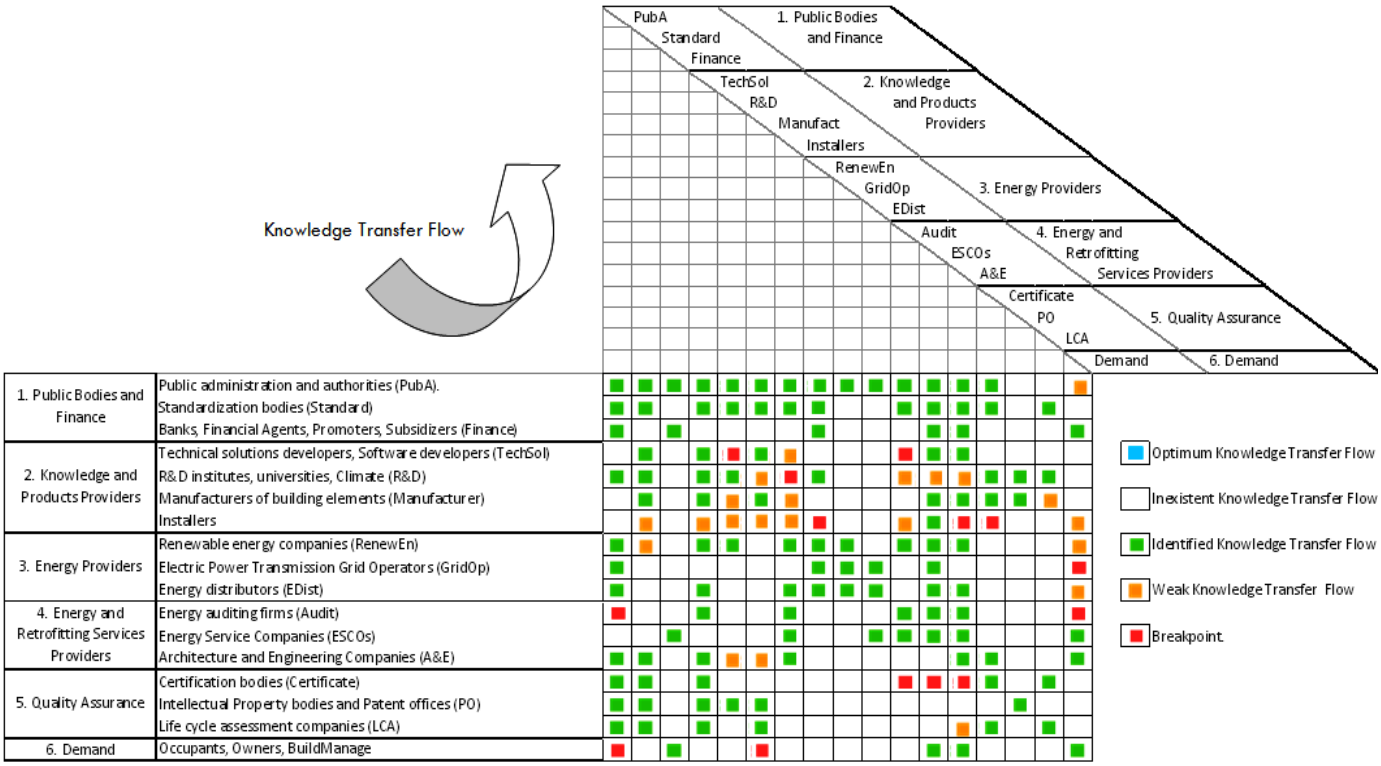


Figure 9: Knowledge Transfer Flows analysis (Deliverable 2.2)

The deliverable concludes with a SWOT analysis revealing the importance of the interaction between the value chain agents and its relation with the sector's success (Figure 10 and Figure 11).

Strengths

- Knowledge transfer flows (KTF) from Public Bodies & Finance, ESCOs, POs and EDist are quite strong.
- The KTF from Standard is strong and EE-Retrofitting Directives are already constituted.
- The KTF between PubA & Finance and all value chain members under the Quality Assurance group is highly strong.
- Energy Providers and Energy Service Providers relationship is strong.
- The Energy Price increases exponentially.

Weaknesses

- KTFs from Installers, i.e. feedback, which should normally exist, lack 90%.
- The low connection between Installers and R&D, TechSol, Manufacturers, Audit prevents meeting the demands of market.
- Government bodies, Universities, Chambers and other non-governmental organizations are not very active in creating awareness.
- Lack of Governmental funding for promoting collaborations between R&D and Manufacturers.
- Low awareness of Occupants and A&Es on EE-retrofitting measures.
- Lack of demand for changes in the regulations from Occupants.
- Lack of connection between same actors in different countries (in the Mediterranean).
- Lack of knowledge on how to reach reliable information on retrofitting technologies.
- Unconcerned approach of R&Ds for transferring the scientific research results throughout the value chain.

Opportunities

- EE-Retrofitting is a concept which allows the modifications or changes of relevant new regulations.
- New energy efficient technologies can be used and evaluated on present buildings.
- Highly improved KTF of PubA and Finance bodies may provide a common platform to gather the value chain members.
- Governmental organizations' ease of creating budget for EE Retrofitting.
- Role of technical chambers, e.g. Chamber of Engineers, Chamber of Architects, etc. in improving knowledge transfer flow.
- Wide applicability area of EE Retrofitting for vast majority of buildings.
- Opportunity for developing new business models in this sector.

Threats

- Lack of KTF from installers obstructs the improvements in EE Retrofitting technologies.
- The fundamental members practising EE-Retrofitting (Manufacturers, Installers and TechSol) are not integrated to the flow chart as it is expected.
- Technological studies progress faster than understanding and applying them to new techniques.
- Economic restrictions prevent innovation in new technological applications.
- Limited interest from local stakeholders due to lacking dissemination initiatives on methodologies, technologies, materials.
- Because of the weak KTF – not reaching the 2020 goals.
- The different regional and local legislations reduce the market dimensions (fragmentation).
- Lack of interest of the business sector in long term environmental issues.
- The capacity of SMEs to actively engage in knowledge transfer activities is limited by constraints in human and financial resources.

Figure 10: SWOT Analysis developed in D2.2.

		EXTERNAL FACTORS: Opportunities	EXTERNAL FACTORS: Threats
INTERNAL FACTORS	Strengths	**Strategies to make use of Opportunities through Strengths** • Since EE-Retrofitting is a concept being scrutinised, well-planned assessment of methodologies, technologies and materials may provide a substantial framework for future applications. • Performing technological studies on present buildings will reinforce R&D in the retrofitting field. • Planning new initiatives for reducing the energy cost.	**Strategies to prevent Threats through Strengths** • Organised dissemination and publicity for local stakeholders through portals dedicated to retrofitting. • Boosting networking actions and activities bringing together governmental organizations that have been dissociated from the value chain. • Increasing collaboration between the value chain members may ease the new technological developments needed by the market. • Development of high school curricula presenting retrofitting matters from the early stages of formal education. • Training of Installers by the financial support of PubA and Finance Bodies.
	Weaknesses	**Strategies to make use of Opportunities to minimize Weaknesses** • Engagements and new regulations had to rely on feedback from Installers. • Technological studies on present buildings can create a paradigm of collaboration for R&Ds and TechSol, Manufacturers, A&E and Audit experts, thus, ensuring a more effective knowledge transfer. • Considerably high KTF from PubA enhances awareness. • Connections between PubA and Finance bodies may result in new financial incentives, thus, enhancing collaborations among different parties. • The increase of awareness and apprentices of Installers and A&Es could be organised through vocational training programmes offered by Chambers or specialised educational institutions.	**Strategies to minimize the potential dangers lying in sector where Weaknesses meet Threats** • Low governmental supports and high expenses of new technologies may restrict EE-Retrofitting applications. • Lack of KTF from separated members (Installer, Manufacturer and TechSol) prevents reflecting new technologies to applications. • Use of successful demonstrators for dissemination/awareness purposes.

Figure 11: SWOT Strategies developed in D2.2.

At the same time Deliverable 2.2 was focusing on the analytical study of the sector's knowledge transfer status, Deliverable 2.1 was intended to compile best practices as a state of the art of the Mediterranean region. The deliverable D.2.1 "*State of the Art Base Report*" contains an analysis of the most relevant topics in the sector going through different Mediterranean countries. One of the topics studied in this report was the Cross-Sectorial Cooperation. The information is focused on the knowledge produced by different cooperation activities, such as R&D projects, workshops and other cooperation experiences, from the European scope to a national level prioritizing initiatives that involve Mediterranean States. A summary of some of the most important strategies analyzed are presented below.

European Projects

Acronym / Name	Main subject	Website / More info
ELIH-Med	Low cost energy efficient investments and retrofitting	http://www.elih-med.eu
MEDEEA	Improvement of the local governance of energy issues in MED area	http://www.interregmed eea.eu
SERPENTE	Energy efficiency in different typologies of publicly owned or managed buildings.	www.serpente-project.eu
E4R	Energy retrofitting of buildings.	http://www.e4rproject.eu
TRAINREBUILD	Training property owners and local authorities on building retrofitting	http://trainrebuild.eu/
ZEMEDS	Promoting renovation of schools in a mediterranean climate up to nearly zero-energy buildings	http://eaci-projects.eu/iee/page/inc/Popup_PDF.jsp?prid=2642
POWER HOUSE NZC	Develop NZEB capacity-building programmes delivered at local level	http://eaci-projects.eu/iee/page/inc/Popup_PDF.jsp?prid=2542
SMILEGOV	Enhancing efficient implementation of sustainable energy action plans in European islands through reinforcement of smart multilevel governance.	http://europeansmallislands.com/smilegov
TRAINENERGY	Training in energy efficiency in buildings.	http://www.trainenergy-iee.eu/
Build-up Skills	Increase the number of qualified workers across Europe to deliver renovations offering a high energy performance as well as new, nearly zero-energy buildings.	http://www.buildupskills.eu/en/national_projects
EDEA	Energy efficiency in design and construction of social housings	ttp://www.proyectoedea.com
EDEA Renov	Energy efficiency in retrofitting of social housings and neighbourhoods	http://www.renov.proyectoedea.com
EnEf	Energy Training and capacity in construction sector.	http://www.enef-project.eu
Promoeener-A	Promotion of energy efficiency and renewable energies in public administration buildings.	http://promoeener-a.com/

National Projects

Acronym / Name	Main subject	Country
R&I-2008-026	Solar Hot Water Controller so as to Automatically Control the Use of Electrical Energy Through the Use of Back-up Heater in Inclement Weather, Thereby Reducing Energy Consumption and CO2 Release.	MALTA
REPEX	Energy retrofitting buildings: opportunity of employment in Extremadura, a solution for energy poverty.	SPAIN (Extremadura)
CESCON	Energy Efficiency in thermal envelope	SPAIN (Valencian Community)
REHATICA	Energy refurbishment of buildings software.	SPAIN (Valencian Community)

Platforms and sectorial clusters

Acronym / Name	Main subject	Website / More info
RHC - Platform	Renewable heating and cooling European technology platform.	http://www.rhc-platform.org
GreenBuild Malta	Building Industry networking (Mediterranean)	http://www.buildupskills.eu/en/national_projects
PTEC	Spanish technological Platform of construction	http://www.construccion2030.org
Cluster of Energy	Spanish cluster of Energy	

Associations

Acronym / Name	Main subject	Website / More info
OME - Observatoire Méditerranéen de l'Energie	Promotion of cooperation and collaboration between organisations and enterprises in the energy sector, within the framework of the Euro-Mediterranean partnership.	http://www.ome.org
MEDENER - Mediterranean Association of National Agencies of Energy Conservation	Brings together 12 organizations from both shores of the Mediterranean in charge of energy efficiency and renewable energy development policies.	
E2B EI	Energy efficiency in European buildings	http://www.e2b-ei.eu
Cyprus Architects Association	Energy efficiency retrofitting	http://www.architecture.org.cy
ANERR	Refurbishment of buildings	http://www.anerr.es

Workshops and Meeting Points

Acronym / Name	Main subject	Website / More info
EME3	I World meeting in energy efficiency in buildings	http://www.encuentroeme3.com
GENERA	Energy and environment	http://www.ifema.es/web/ferias/genera/default.html
FICON	Iberian Workshop of Construction in Extremadura	http://www.feval.com/lenya/feval/live/ferias/ficon.html
Ecological Design	Energy efficient design	

Other cooperation experiences

Acronym / Name	Main subject	Website / More info
IPEEC	International partnership for energy efficiency cooperation	
SAVE and REDUCE: Eco-Gozo Home Consultancy Visits	Energy and water conservation. Renewable energy	http://www.ecogozo.com/index.php?option=com_content&view=article&id=228&Itemid=38&lang=en

In order to classify these types of cross-sectorial cooperation experiences analysed in deliverable D2.1 3 different sub-categories are identified in the table below that clearly represent the 3 levels where activities that promote interaction can be undertaken (Table 6).

Cross-sectorial cooperation

Experiences/ topics (D2.1)	Sub-categories (D6.3)
European Projects	R&D Projects
National Projects	
Platforms ans sectorial clusters	Associations & Clusters
Associations	
Workshops & Meeting points	Events & Networking Strategies
Other experiences	

Table 6: Cross-sectorial cooperation sub-categories

Recommendations, Guidelines and procedures will be provided for the 3 sub-categories within the 3 fold approach (Figure 12).

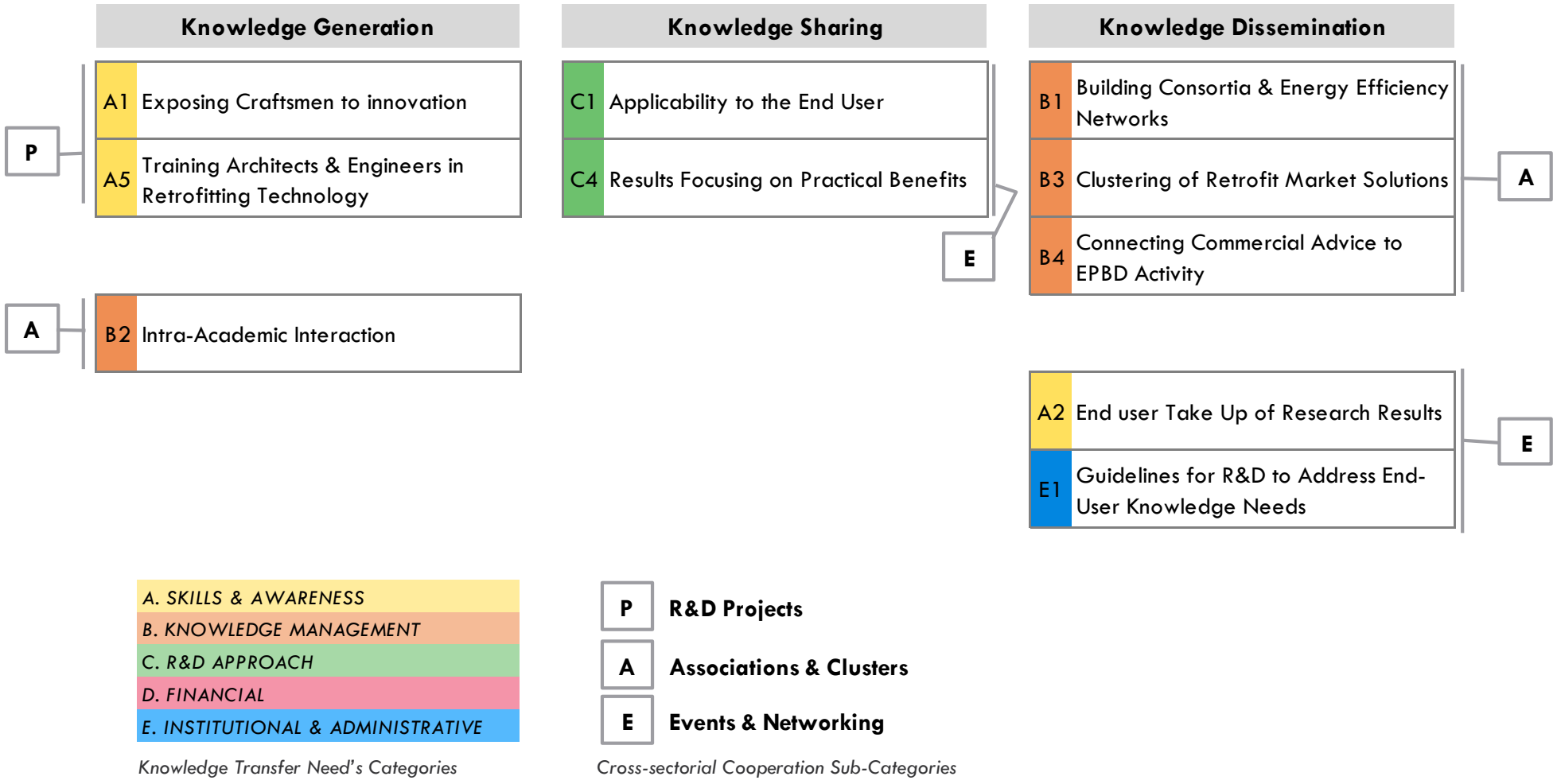


Figure 12: Cross-sectorial sub-categories for the KTF needs within in three fold approach

The Cross-sectorial Cooperation sub-categories establish 3 levels of cooperation or interaction between agents of different sectors within the Energy Efficiency Building Retrofitting value chain.

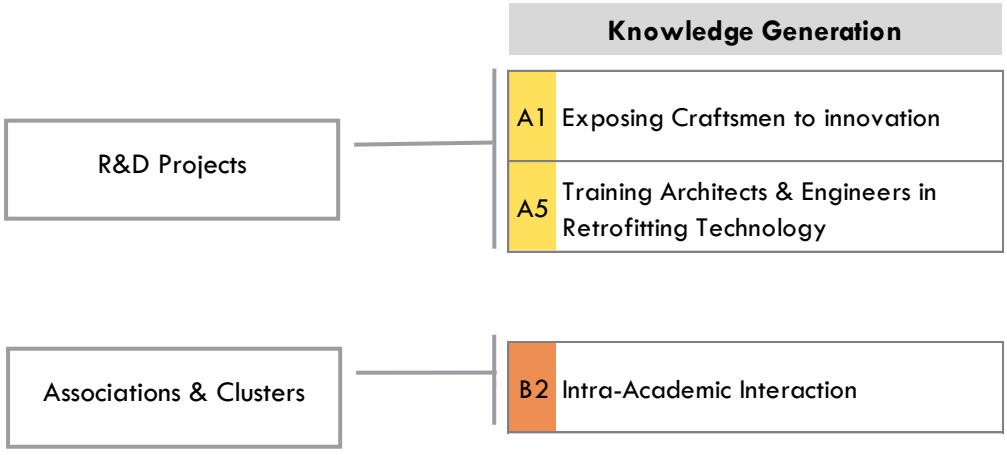
- **R&D Projects (P):**
  In the most official approach and usually under a funding scheme, R&D projects suppose an intensive cooperation amongst entities which represent different sectors (industrial, educational, etc.) and participate in the EE Building Retrofitting sector. The necessary interaction between the partners results in a cross-sectorial activity with many variants depending on the objectives of the project. Projects can take part from the smallest local level to an international approach involving also a cross-border activity. The guidelines for this sub-category are designed to provide tips to resolve cross-sectorial cooperation related issues through R&D projects as a key mechanism.

- **Associations & Clusters (A):**
  Associations and clusters are not always related to R&D development; however the cooperation is intended to last longer. This sub-category is related to all the KT Needs that signify the need of a cluster, association or any consortia in order to achieve specific KT requirements. In most cases specific agents are sought for the group and have a continuous but lighter interaction. Clusters are aimed to increase productivity, thus business clusters and cluster development are specially considered within strategic economical plans. The guidelines developed for this sub-category will employ cluster's and association's advantages to resolve the sector's needs.

- **Events & Networking Strategies (E):**
  Other cooperation actions such as events and networking strategies can be considered activities which besides its very short duration have a very intensive interaction. Networking' is an activity where like-minded people (usually business people) recognize, create, or act upon business/ professional opportunities. A professional network service is an implementation of information technology in support of business networking and is a low-cost activity. Networking meetings have a random periodicity that depends on the interests of the group. Even so, events may have the very shortest duration but in many of them a networking session is considered, which focuses on one of the event's topics. Guidelines will offer events & networking solutions for the sector's needs.

4.2. Procedures, Recommendations & Guidelines for Knowledge Generation

The knowledge transfer needs that belong to the Knowledge Generation approach are:



4.2.1. R&D Projects (Knowledge Generation)

In the EE building retrofitting process there are some agents of the value chain that are actively involved in different stages specially when a technology needs to be implemented (see *D1.1. "Methodological Framework Analysis"*). Professionals such as architects, engineers and installers, are in the group of value chain actors (in the value chain) and they are in charge of implementing the EE retrofitting technology itself. They also represent the largest group of all the value chain agents which increases their impact in the sector. Indeed, Deliverable D3.1 *"Knowledge Generation and Transfer Processes Report"* contains an analysis of the level of importance of the needs, and needs A5 and A1 are situated in position #1 and #3 respectively. R&D Projects can conduct an effective cooperation instrument to transfer the innovation knowledge lacking within this group. Recommendations, procedures and guidelines for this topic are detailed below.

- In order to implement a higher level of education for construction professionals (architects, civil engineers, building services engineers, project managers, building designers, etc) a **transformation in the curriculum** is necessary to include more innovative contents. However connecting Masters and Bachelors curriculum to R&D activities can conduct to an effective way of interaction with new knowledge. This would imply that R&D projects, not the only ones with an educational focus, consider undertaking activities that require the presence of students. The new knowledge will be connected to the learning process.

- Other construction professionals can also benefit from cooperation activities of R&D Projects and European-wide education Projects, in any dissemination event organised within these. **Dissemination activities**, as a fundamental part of projects and must consider the attendance of a targeted audience. The best way to improve this interaction is keeping under the projects funding programme this requirement suggesting best ways to reach a wider audience. Different dissemination activities within R&D projects, such as informal learning events, can reach more stakeholders to transfer not only innovative results, but findings related to the socio-economical problems of the sector towards energy efficiency technologies. For European-wide education projects (not only R&D), activities focusing on the craftsmen, technicians, architects and engineers can improve their awareness and ability on EE retrofitting.

- Considering the fact that many of these professionals develop their activity in the public sector, R&D Projects can also take part of a cross-sectorial cooperation promotion as a geographical approach requires in many occasions **public administration's participation**. When the Public Administration agent is involved in a R&D Project the stakeholders reached is multiplied. Some examples are given below (see section 4.1):

    - MEDEEA Project promotes cooperation among municipalities in MED regions in the area of energy efficiency and promotes the European Energy Award – eea®. An important milestone indicates that 16 new ee-advisors will be trained and 72 municipalities will be involved.

    - SERPENTE Project aims to promote understanding and application of EE initiatives, promote responsible energy consumption among public building users, identify good practices and exchange them among 10 EU regions, design and implement 5 pilot actions, etc.

    - TRAINREBUILD Project aims to train property owners and local authorities – the demand side of the buildings value chain - and encourage retrofitting in a wide range of residential buildings, spanning from individual to multi-family houses and from private to social housing.

    - ZEMEDS responds to EU objectives by assisting public sector on going beyond the proposed 3% renovation target and bringing together industry elements to provide packaged solutions. The action focuses on renovating schools from EU regions on the Mediterranean region. Schools represent an important part of the building stock in the Mediterranean regions.

- Traditional craftsmen present a different problem than professionals as the cooperation activity proposed must be undertaken under a practical approach. This means that **pilot demonstration projects** are the most suitable to satisfy the agents needs as many different innovative technologies can be executed in real life. Furthermore, other R&D projects aim to interact traditional craftsmen by developing specific training programmes. Best practices have been detected already in some projects:

    - TRAINENERGY Project develops a continuous, practice-oriented implementation and dissemination of the EPBD 2002 and energy end-use efficiency and energy services 2006 by training craftsmen and trainers in the construction trade.

    - Build-up Skills Project aims for the development and endorsement of a National Qualifications Roadmap continuing education and vocational training of the workforce in the building sector.

    - EnEf Project aims at designing energy training modules and contents focusing on energy efficiency in buildings. This project will contribute to cost effective energy efficiency, reduction of emissions bringing significant emissions reductions and cost savings to Member States.

- An additional and innovative strategy that can be achieved through knowledge generation, in R&D projects related to energy efficiency, is the **creation of spin-offs**. This will suppose taking advantage of the outcomes of the projects and conducting to a real interaction of agents across the sectors. The possibility a project has to end up in a spin-off not only depends on the topic but on the partners, their technical and economical opportunities, and willingness to exploit the projects' results. Hence, considering this feature within funding programmes or establishing regulated bases for spin-off generation can produce a new mindset for new projects.

4.2.2. Associations & Clusters (Knowledge Generation)

Additional mechanisms that can benefit knowledge generation are clusters and associations. The cooperation between agents within a cluster or association has a great potential to conduct to new ideas and developments as they share common objectives. Guidelines in this scenario are detailed below.

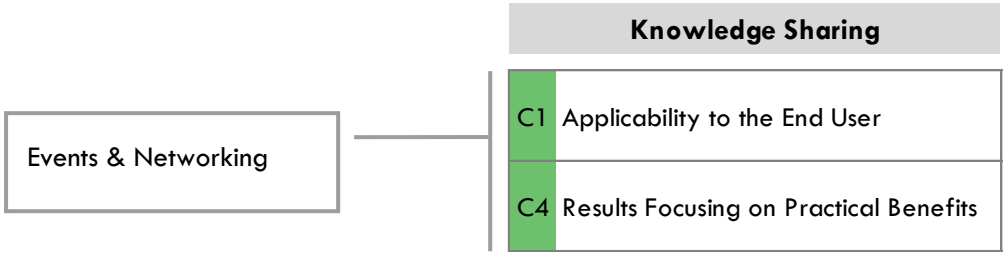
- Research institutions need an increased interaction between them to share their knowledge and thus generate new one. A solution proposed in deliverable D3.1 was to move academic staff between institutions under different exchange programmes in a short term interaction. In the long term is considered the creation of knowledge banks, establishing online forums, and organising events for collaborative joint research activities. The development of **research institutions associations** can foster the implementation of the proposed solutions and will boost cooperation skipping programmes and other mechanisms necessary to bring them together.

    - **Marie Skłodowska-Curie actions**: The MSCA provide grants at all stages of researchers' careers, from PhD candidates to highly experienced researchers, and encourage transnational, intersectoral and interdisciplinary mobility [http://ec.europa.eu/programmes/horizon2020/en/h2020-section/marie-sklodowska-curie-actions].

- On other cases **clustering between different agents** can provide knowledge as well with a different focus than exclusive research. An interesting solution could be associations of research institutions with public administrations or even with financial entities. This clustering can conduct to the creation of programmes to assist the government and end user in energy saving matters, economical advice, etc.

4.3. Procedures, Recommendations & Guidelines for Knowledge Sharing

The knowledge transfer needs that belong to the Knowledge Sharing approach are:



4.3.1. Events & Networking (Knowledge Sharing)

One of the main benefits the agents of the value chain can take from an event or a networking session is the professional/business opportunities created as mentioned in the previous section. It means that the interaction brings new ideas, thoughts, expectations, etc. around a topic. This knowledge exchange, effectively exploited, can cause a positive effect towards the building retrofitting scenario, especially for the consumer sector represented by end users. The lack of knowledge sharing from the research agents to the rest of the value chain hinders the realization of the EE retrofitting sector.

The interaction originated through events & networking creates a direct communication channel between these agents promoting cooperation and a quality research. The more agents/sectors get involved in knowledge sharing, the more added value and impact the cooperation will have. Recommendations, procedures and guidelines for this topic are detailed below.

- Increasing the contact between scientists with occupants in order to understand the applicability of their research can be achieved by organising **Research – End User events**, such as open days, fairs, exhibitions or any informal event organized by the research centre or a public administration looking forward this interaction. The event must consider gathering feedback from the attendants either through a scheduled session or face to face. Within the scientific dissemination activity, specific scientific publications have a greater relevance and impact than disseminating through informal events. However, as this events can cause a greater impact in the sector (end users and research activity), they should be considered within the research project.

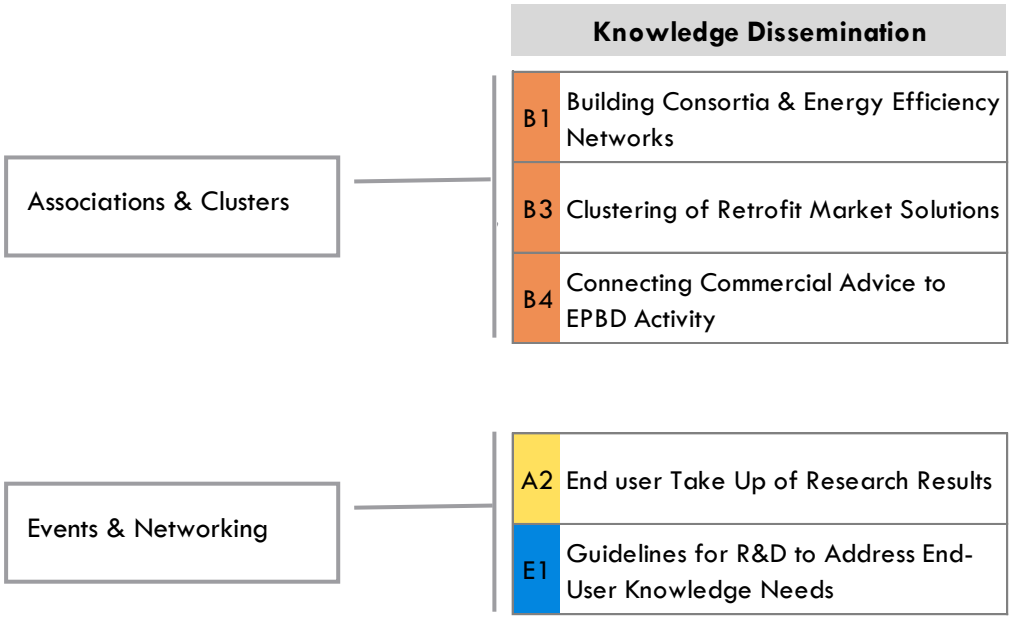
- In order to develop a proper event for end users the content presented should be carefully adapted, not only to avoid scientific language and a cumbersome content, but also to focus on what the real interest of the end user is. **Practical benefits** of the retrofit technology must be the core of shared content. Moreover, this information needs to be presented not only in events, but in any type of document developed for a common audience.

- Sharing knowledge through **online networks** that allow rating, comments, etc. can result an easy solution for the research entities looking for this interaction. In a smaller scale each research projects on EE building retrofitting technologies may allow this interaction through the project website. Social media profiles can also do this job and are already closer and familiar to the end users.

- Knowledge sharing can also take place through **specialized networks** for specialized agents. R&D supported forums or professional social media communities can achieve sharing to technical agents looking for innovative technical knowledge. The encouragement towards the sharing of R&D technical knowledge needs to pay more attention on the professionals than on the R&D agents.

4.4. Procedures, Recommendations & Guidelines for Knowledge Dissemination

The knowledge transfer needs that belong to the Knowledge Dissemination approach are:



4.4.1. Associations & Clusters (Knowledge Dissemination)

Associations and clusters consist on a group of people with same objectives and are favourable for knowledge generation as previously observed. However, the dissemination of relevant knowledge is actually within the main tasks of any cluster, making use of its large contact list perfectly identified. Recommendations, procedures and guidelines for this scenario are detailed below.

- Establishing network organizations can coordinate knowledge transfer from innovation groups and assist in implementing innovation into daily building practice. With different type of agents taking part of the consortia, such as policy makers, public administrations, non-governmental organizations, universities, companies and other institutions involved in research and innovation, the information flow can be potentially increased. The dissemination activities can be established as a mandatory action within EU programmes applicable to all of them.

- Clustering of companies working in retrofitting innovations within the retrofit market can provide integrated solutions to practical problems. The cooperation between them can provide a faster answer to the market demand and innovation advantages. This cluster is not restricted to the most technical agents of the value chain but should also include companies involved at different levels such as producers, technical solution companies, craftsmen, etc. The dissemination executed across these companies will not only promote energy efficient retrofitting improvements but can also foster technology dissemination to the end user.

- Connecting technical commercial advice to EPBD requirements (energy performance and requirements of the actual buildings). The lack of information regarding the EPBD standards in the end user's side is a barrier for the sector's development as the end user's demand is vague and uncertain. The information on this topic must be adapted for the building owners and

disseminated through the business society. These dissemination events can be organized by public authorities, with a direct contact with end users, providing as well guidance to the business society for providing this information.

- Associations & Clusters that involve laboratories can also accelerate innovation. Disseminating good and poor experiences on retrofit technologies can benefit networking and impulse innovation advances. The ones with strong relations with R&D institutes or influence over them can impulse these dissemination experiences.

4.4.2. Events & Networking (Knowledge Dissemination)

In addition to the opportunities originated thanks to events and networking for knowledge sharing, it is obvious that knowledge dissemination goes hand in hand with them. Recommendations, procedures and guidelines for this topic are detailed below.

- Educational events can assist end users to have a better capacity and motivation to take up the research results and use these results in their buildings. Transforming the R&D knowledge and networking will make available this information to the building owners. Thus, research organizations and companies must also look after encouraging the take up of their own information in dissemination activities.

- Technology Transfer Offices serve for the university and the SMEs/Companies with the aim of raising awareness, training and knowledge transfer, securing funds for R&D and innovation, finding a common ground for researchers and SMEs, providing IPR consultancy services, entrepreneurship and license for the ideas which can be turned into financial assets. TTOs have been playing a pivotal role in increasing the innovation capacity in the Mediterranean region and in building bridges between the academia and industry. It does so by, amongst others, advising various key stakeholders on how to stimulate and increase the innovation and R&D level of the industry, adopting international developments to the local situations, advising the SMEs on issues such as research, IPR, innovation management, new investments and strengthening the ties between universities and businesses

- Knowledge dissemination of EU funded project's results is a bigger concern for the European Commission. Hence, EC guidelines to effectively disseminate this knowledge can assist the research institutions to achieve this task. How to develop an effective dissemination event, or a networking session, are questions that can be answered from the EC providing a solid base to start on. In deliverable D3.1 some guideline content is proposed for this aim, such as:

    - Having professional knowledge brokers available to assist in the organization of dialogue events to pass results of research projects.

    - Strategies to implement knowledge transfer at a cluster level and not only at project level.

    - A clear definition of the end user/target groups for a particular project defining their needs and potential in order to be able to provide coherent knowledge resulting from a research project that will be included in the public deliverables.

5. CONCLUSIONS

The cross-sectorial cooperation between different agents throughout the building retrofitting sector was the core topic for this final report, one of the 4 last technical reports of the ee-WiSE Project. The importance of the topic to improve the energy efficiency practice in buildings justifies the special interest given to it. The general recommendations provided within this deliverable D6.3 have been identified through the outcomes of previous workpackages, and their implementation will benefit the sector's interaction promotion in different key aspects.

- Any of the stakeholders involved in the strategies to enhance cross-sectorial cooperation will experience a professional upgrading in energy efficiency matters. Besides the need detected for this knowledge to fall in technical agents, it has a special consideration for agents who develop their activity different areas/sectors, such as financial agents or public administrations. The end-users, on the demand group of the value chain, will be incentivized to handle cleverly with energy efficiency ideas.

- New opportunities are created through the agent's interaction. In addition to the training and technical gain the strategies provide, the chances of earning economical profits by undertaking these activities appears as a new opportunity in a long term approach.

- The dissemination of R&D knowledge from the scientific agents has been always a struggle for the sector due to the limited circulation of this knowledge between R&D agents. The recommendations that promote R&D sharing will transform any sharing experience into a dissemination channel to other agents of the value chain.

- ICT tools have taken an important place in the guidelines for knowledge sharing provided not only in this document, but also within the ee-WiSE *Knowledge Transfer Tool*, available in the project's website. Networks, community portals, and any IT-based tool that facilitates user's interaction, are the key technological support of knowledge sharing activities. The interaction and sharing is bigger when these tools include a rating option.

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