



# STAKEHOLDER ENGAGEMENT

## Final Report

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## Introduction

The Request2Action project aims at driving retrofit action in the residential sector by addressing the knowledge and capacity building barriers making retrofit data available to home-owners, the supply chain and policy makers in new and dynamic ways. Data from EPCs, if properly collected, archived, managed and analysed, can provide precious information and complement other sources for decision making on the energy performance of buildings. Much wider access to, and affordability of large scale data handling technologies (the “big data revolution”) makes possible the presentation of this data in accessible ways for policy makers and market actors. Intuitive analysis for predictive insight is spreading nowadays, and a number of dedicated services and open platforms are available, even in the energy sector.

REQUEST2ACTION has resulted in the development of new approaches and tools that can make retrofit data available to the supply and demand side market actors. These **Data Tools** (Work Package 2 – Work Package P3 pilots) can be used on a stand-alone basis or can be used within integrated **Retrofit Hubs** (Work Package 4 pilot platforms) that will serve:

- as a market place to connect demand and supply side actors
- as knowledge platforms for key actors such as trade federations, financiers, policy makers
- as monitoring platforms for refurbishment activities.

R2A Work Package 5 (WP5) has led the **engagement of stakeholders** in the development of single Data Tools (WP2, WP3) and Hubs (WP4) in the Partners’ Countries as a **cross-cutting action of the project**.

At the beginning of the project Stakeholder engagement (SE) guidelines (D5.1) supplied the general rules to facilitate and support a high-quality and solution-oriented dialogue, deliberation, planning, and action by key actors within the Project challenges on energy and low-carbon renovation of buildings. A mechanism for consultation comprising periodical or on-purpose Stakeholder working groups and engagement actions has been created by the Partners to get input to their pilots, that can also generate long-lasting networks focused on energy and low-carbon renovation of buildings.

For each of the pilot projects delivered, there has been a common process of stakeholder input that was followed by stakeholder validation/evaluation of the outputs produced.

R2A Partners stirred dialogue and stakeholder collaboration in providing specifications, relevant information and evaluation that are essential to guarantee consistence and effectiveness of their national pilot projects (transferable tools and hubs).

**Table 1 – Overview of R2A pilot projects**

<p><b>Monitoring the uptake of EPC recommendations</b> (Work Package 2) Target Groups: Local Authorities, Decision Makers <b>Pilot Countries: Austria, Italy, The Netherlands and Portugal</b></p>
<p><b>Data tools for optimised information for market actors</b> (Work Package 3) a) Target Groups for HEC - Home Energy Check enhanced self- assessment advice: householders <b>Pilot Countries: Greece, Italy, Slovakia</b> b) Target Groups for "optimised information" on retrofit data: various market actors <b>Pilot Countries: Italy</b> (Regional and Local Authorities), <b>Netherlands</b> (financial institutions, householders), <b>Slovakia</b> (Municipalities) and <b>United Kingdom</b> (local Authorities, Trades people)</p>
<p><b>Retrofit Action Hubs</b> (Work Package 4) Target Groups: various market actors <b>Pilot Countries: Italy, Greece, Portugal, Belgium, United Kingdom</b></p>

**Planning/Input** built on the examination of similar existing and upcoming initiatives at national and regional level.

**Evaluation** of the tools and the hubs occurred after their soft launch. Stakeholder engagement in Pilot evaluation and validation should result in ensuring the project outputs’ usefulness, reliability, quality and self-sustainability. Outputs of the Stakeholder engagement will have a key role for the assessment of the Hubs to be financially self-sustaining and for the evaluation of the whole project impact.

**This report synthesises the results of the R2A Stakeholder Engagement process that has been performed by the partners to develop the R2A services and illustrates how the different market actors respond to the new information/services being made available.**

Lessons learned from the stakeholder engagement and recommendations for further refinement of R2A services are summarised in the last chapters.

## R2A Stakeholder engagement

Within the R2A project hundreds of stakeholders in 8 countries collaborated in providing specifications, information and evaluation that are essential to guarantee effectiveness of the data services, according to modern product-service systems (PSS) approach, providing customers value and functionalities to fulfil sustainable goals.

National and regional energy agencies have access and expertise in EPC data. Through this project agencies have used that expertise to set up services to provide accurate, trustworthy building performance data improving insight. These services, are developed as stand-alone tools or integrated tools within retrofit action websites (R2A Hubs) that will serve as an online market place to connect demand and supply side actors and monitoring platforms for policy makers.

When **engaging stakeholder in R2A Pilots**, Partners initiated, managed, performed and evaluated **two-way dialogue** seeking understanding and solutions to mutual concern on issues related to better use, access, display of EPC data and action on building renovation so **participating to co-creation of R2A pilot projects**.

To take forward this co-creation process, the partners coordinated and facilitated stakeholder engagement at regional and national level. Ad hoc guidelines on mandatory topics to deal with, procedures, and feedback questionnaires were provided to Partners in order to standardise this process getting comparable results. A common SE process phases (Confidential deliverables D5.1, D5.2) provided a benchmark for the quality and effectiveness of SE engagement in R2A.

The engagement **methodology consisted of six steps**, when the consultation strategy and rules have been established, the key interlocutors have been identified, the engagement plan have been defined, engagement sessions organized and performed and the overall process evaluated. In the preparation phase Stakeholders have been identified and classified according to their role:

- **Key player:** stakeholders with high interest and influence. They have power and resources to block or implement solutions
- **Context setters:** highly influential stakeholders, but having little interest. They may be a risk, should be monitored and managed
- **Subjects:** stakeholders affected by the issue, having high interest but low influence. They are usually supportive
- **Crowd:** stakeholders who have little interest or influence over desired outcomes. There is little need to consider or engage them
- **Responsible:** stakeholder responsible for a problem or issue (eg. policy makers, decision makers, Agencies, ....)

An overall SE Plan (D5.2, Jan 2015) has been released, showing how stakeholders would be engaged from the R2A partners according to the T.5.2.2 templates delivered by ENEA. Each Partner's plan (PSEP) included the stakeholders' analysis, the desired level of cooperation, the expected contribution and scheduling of input and validation/evaluation engagement sessions. The Plan was then used to monitor the process compared to the actual stakeholder engagement performed at the end of the action.

The stakeholders were consulted using qualitative and quantitative research methods to assess how they perceived the value of R2A data service concepts for their businesses and to co-create them. Integration of existing products/services, development of support functions, collection and storage of data from stakeholders, definition of business models, were carried out during the data-services design and development phase. The workshops with the stakeholders resulted in specifications, relevant information and feedback to functionalities, outline and presentation of R2A building performance data services, thus guaranteeing their consistence and effectiveness once operating. Stakeholders were engaged again - once the services had been completed – to validate and use the services. The interaction between the typical PSS methodology and the SE methodology can be found in Figure 1.

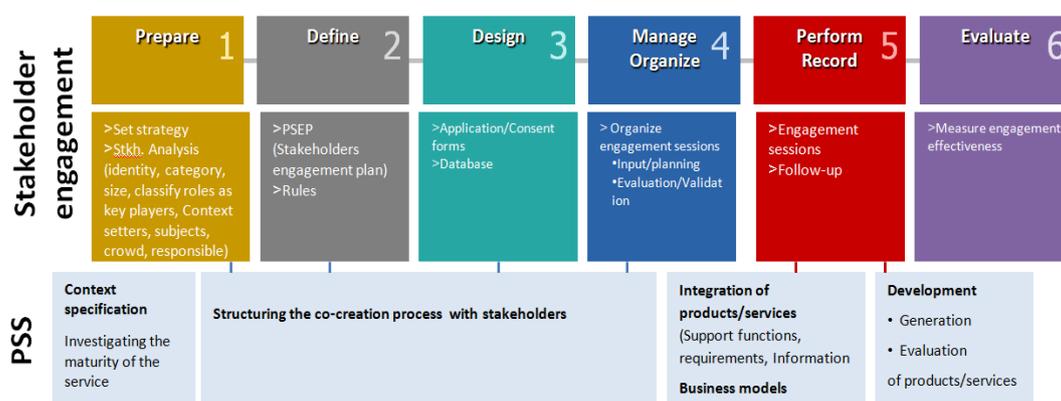


Figure 1: Stakeholder engagement in R2A compared to typical PSS methodology

Stakeholder engagement in the PSS design and development phase was mainly “performed” through two series of workshops: **input** to (2014-2015) and **evaluation/validation** of (2016-2017) the R2A data-services.

Originally the Partners were supposed to perform one workshop per phase. Actually, Partners have decided to consult and meet their key actors and stakeholders in more than two events performing 57 workshops/webinars (much more than the 18 initially predicted).

**Table 2 - number of engagement workshops per R2A Partner**

Overview of pilot Planning /Input Workshops engaging Stakeholders			
Data Tools (WP3)		Retrofit Hubs (WP4)	
Austria, AEA	9	Belgium, VITO	13
Italy, ENEA	4	Greece, CRES	3
The Netherlands, RVO NL	4	Italy, ENEA	1
United Kingdom, EST	2	Portugal, ADENE	2
Slovakia, SIEA	1		
Overview of pilot Evaluation Workshops engaging Stakeholders			
Austria, AEA	4	Belgium, VITO	1
The Netherlands, RVO NL	-	Greece, CRES	3
United Kingdom, EST	2	Italy, ENEA	5
Slovakia, SIEA	1	Portugal, ADENE	-
		Poland, KAPE (R2A Hubs)	1
<b>Total</b>	<b>27</b>	<b>Total</b>	<b>30</b>

\*Note that stakeholder input to **WP2** pilots happens through face-to face, bilateral meetings with governments.

During **the input phase**, stakeholder contributed to fix key requirements of R2A data-services, replying to questions as:

- *What EPC information is used to monitor retrofit?*
- *What is the added value of using EPC data for planning and decision making?*
- *Which additional data are needed and have to be integrated to get wider use of EPC databases?*
- *What is the recommended user interface/data format?*
- *Are comprehensive renovation one-stop-shops/platforms already in place at local/regional/national level?*
- *Which characteristics are needed for effective renovation HUBs?*
- *Which are the preferred topics/functionalities for a Retrofit Hub?*

After the first (input) phase, WP5 supplied **recommendations to all WPs** (D5.5, Feb 2016) in order to integrate the results of the engagement into the further development of the R2A pilots. The stakeholder evaluation phase was linked to the timing of the R2A pilots and occurred at the very late period of the R2A, finishing in May-June 2017 for most of the Partners.

For the R2A services **evaluation** they were asked if:

- *workshops provided them with data/services they can use in their role*
- *they could easily use the data/services provided by the R2A partner*
- *they would be willing to share data/resources for further development of R2A services*
- *they were interested to participate in future workshops/projects like R2A pilots*
- *they could suggest further improvements/developments*

This report synthesises the results of the R2A Stakeholder engagement process (reported by each single partners) and illustrates how the different market actors respond to the new information/services being made available. Lessons learned from the stakeholder engagement and recommendations for further refinement of R2A services are summarised in this report.

## 1. AUSTRIA - Integration of the klimaaktiv building declaration for professionals

- 9 Input workshops between February and September 2015
- 4 evaluation workshops between April 2016 and 23 June 2017
- 28 different stakeholders engaged all along the project duration
- 28 questionnaires filled by the stakeholders
- 2 informal agreements (ÖGUT and klimaaktiv continuously provided information to and dissemination of the pilot project)

### 1.1 Co-created service/product

Available information from different province sources (including regional EPC data, starting from the province of Salzburg) was combined to the klimaaktiv national declaration system, issuing certification of energy efficiency, good design, and execution, material quality and comfort, within the Austrian Federal Climate Initiative. For this purpose AEA agency cooperated with an EPC-software provider and the host of the klimaaktiv platform. Access to the service, allowing analyses and comparisons all over Austria, is now provided to market actors and provincial governments to uptake holistic and tailor-made expert advice within klimaaktiv.

Main task of the Pilot is the connection of the klimaaktiv database and the EPC database by a SOAP interface (Simple Object Access Protocol). Thereby, 43 of 58 required fields (~80%) for the declaration of a building could be filled automatically. GEQ-EBS is a widely professional tool that is used by energy consultants to calculate the energy savings of a retrofit measure. The check routine has been integrated, to inform the consultant and the client about the applicability of the klimaaktiv minimum standard.

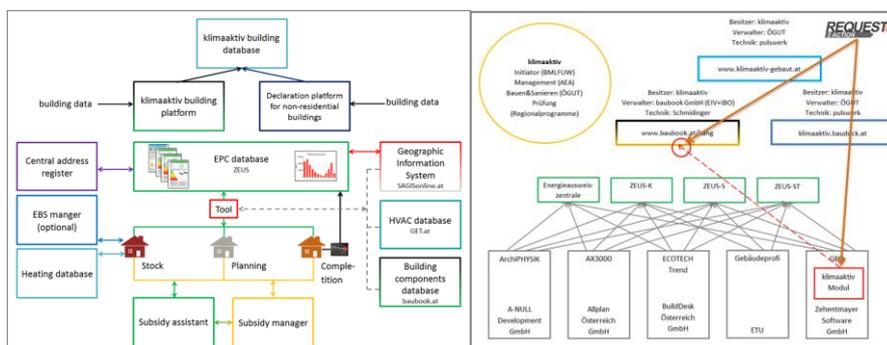


Figure 2: AEA - Existing monitoring processes in the province of Salzburg and integration of R2A Tools

Stakeholders contributed to the coordinated service providing information on existing data, specifications for elimination of redundancies, suggestions on integration requirements of the klimaaktiv standard (e.g. connection between costs and energy efficiency measurements and use of geo-referenced information).

The main users will be the energy consultants who provide tailor-made information for the renovation of the buildings and EPC issuers. The website tool was launched in April 2017 (after two months of testing phase).<sup>1</sup>

### 1.2 Stakeholders involved

In Austria, there are several initiatives with similar topics like the Request2Action project. But all of them are focused on only one topic and not connected to each other (Episcope: monitoring of buildings based on EPC database systems; energy consultation Salzburg: further development of the existing HEC tool; klimaaktiv: national HUB to energy related topics). So the idea was born, to bring all this different initiatives together. It was also very clear, that it would be better to work on a regional pilot project, than on a national pilot project, because the existing tools and processes in the provinces of Austria are different. Austria engaged the following stakeholders in the development of the R2A service for energy experts:

<sup>1</sup> <http://www.klimaaktiv.at/bauen-sarienen.html> & <http://www.klimaaktiv.athaushalte.html>

- **Energy consultation Salzburg:** The subsidised energy consultation programme is a cooperation between the province of Salzburg and the regional energy supplier Salzburg AG. The consortium offers free energy consultations based on a standardised process and tool (GEQ-EBS). Around 45 energy consultants advise and inform private households, enterprises, property management companies and municipalities (around 2.000 energy consultations per year).
- **klimaaktiv:** klimaaktiv is the Austrian Climate Initiative from the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management. The role of klimaaktiv initiative: *“Efficient energy consumption, intelligent mobility, future orientated buildings and the use of renewable energy are the main tasks to protect our climate and to reduce the greenhouse gases. klimaaktiv offers information and consultancy, works on quality standards and helps to build up networks for our climate friendly future.”* The strength of this initiative lies in the established professionals’ network: more than 1,000 regional partners allow a successful and nationwide knowledge transfer, the direct distribution of klimaaktiv objectives and the execution of measures. The klimaaktiv building standard evaluates not only the energy performance of a building, but also its ecological aspects and infrastructure. Approximately 400 buildings are declared under klimaaktiv standards.
- **ÖGUT: the Austrian Society for Environment and Technology** is a non-profit organisation that works on national and international projects in the field of environment and technologies. ÖGUT manages also the klimaaktiv’s programme “Building of Tomorrow” (*Bauen & Sanieren*: New buildings and renovation). Its main tasks are the definition of quality standards and distribution of the klimaaktiv building standards.
- **SIR:** The Salzburg Institute for Regional Planning and Housing is a local institution that works on projects in the field of housing assistance and research, community development and energy issues. SIR is also the regional partner for the execution of the klimaaktiv building programme in the province of Salzburg.
- **Zehentmayer, Tsukalas and gizmocraft:** these three software companies are specialists in programming energy related databases and software tools. As technical experts, they can offer intelligent IT solutions for the implementation of the main tasks listed below.

### 1.3 Input from the stakeholders

By engaging Energy consultation Salzburg (CEO) and Division of energy industry of the Province of Salzburg, both responsible for the implementation of new processes and optimisation of existing ones, existing processes which could be optimised were identified and analysed (strengths, weaknesses). This resulted in the following suggestions:

- Connection between costs and energy efficiency measurements;
- Geocoding of EPC data;
- Further development of the GEQ-EBS tool;
- Integration of the klimaaktiv standard into the existing processes;
- Building of an energy meter matrix;
- Further development of check routines in ZEUS.

Additional information about the existing processes that were publicly available has been detected; interest in the integration of the klimaaktiv standard was investigated and raised.

klimaaktiv, ÖGUT, SIR, energy consultation Salzburg and two regional partners from klimaaktiv agreed on the need to integrate the klimaaktiv building standard into the existing processes of the province of Salzburg.

ÖGUT and the energy consultation Salzburg committed to support the project team in the implementation of the project and discussed about the necessary additional information.

It should be pointed out, that the collaboration of the three institutions that are involved directly into this project (klimaaktiv, ÖGUT and energy consultation Salzburg) creates an added value of all (win-win situation). The energy consultation Salzburg for example could offer additional services (declaration of the klimaaktiv standard); ÖGUT on the other side could push the klimaaktiv standard in the province of Salzburg, because it is be integrated into the existing processes. Klimaaktiv can monitor and list the klimaaktiv declared buildings into its database.

By involving baubook Ltd the technical details of the implementation (SOAP interface for the data transfer) have been investigated and decided. EIV (Energy Institute of Vorarlberg, host of klimaaktiv declarations’ platform) and Zehentmayer Ltd (EPC calculation tool from Salzburg widely used tool) committed for the implementation.

## 1.4 Evaluation from the stakeholders

A meeting in Vienna with ÖGUT in March 2016 settled the final details about the actual implementation of the tool interface, the maintenance and the deadline for the publishing of the new klimaaktiv declaration criteria for the buildings.

In Salzburg (June 2016) a meeting with the software company Zehentmayer and the energy institute of Vorarlberg led to agree the selection of data (building elements and quality), EPC-data upload of the GEQ (EPC calculation tool which used by the energy advisors) regarding the building declaration (klimaaktiv), the compatibility of the interface with the past and the future klimaaktiv criteria, the use of the interface after the end of the project and dissemination possibilities.

Finally, in June 2017, the developed tool and interface were presented to ÖGUT (main stakeholder) and some 15 other stakeholders from different energy agencies and policy makers from all over Austria.

After a short presentation of the project Request2Action and its objectives, the Austrian pilot action (the back ground and interface including its advantages for the market actors) was demonstrated practically. All participants positively evaluated the interface and indicated that they would promote and use (as far as they work with this tool) it.

Many questions were answered which concerned the kind of information produced for the consumers, use of the interface by the users of other software tools and further development of the tool to the new buildings as well as integrating OI3 index (ecologically environment friendly construction material) which is a part of klimaaktiv criteria in the tool.

## 1.5 Impact and further development

The regional partners from the province of Styria and Tyrol declared to be interested on the lessons learned from this project.

All Provinces will use the interface since the klimaaktiv Standard (for the energy efficiency of the buildings) is mainly used as one criterion to receive regional subsidies for the renovation of the buildings. The interest for further development of the tool and interface not only to the other EPC tools but also for the new buildings has been expressed. After the Request2Action period AEA will work on the further development of the interface.

## 2. BELGIUM - Data from citizens to promote collective renovation of residential buildings

- 13 Input workshops between November 2014 and March 2015
- Informal evaluation (no evaluation workshop)
- 24 different stakeholders engaged all along the project duration
- 3 questionnaires filled by the stakeholders
- 1 agreements signed by Genk city, 2 under evaluation (Eandis and Infrac)

### 2.1 Co-created service/product

In Belgium EPC data is not publicly available. To this extent, VITO combined existing housing stock data with information acquired directly from homeowners in Flanders. A renovation platform has been developed in consultation with several cities and distribution system operators (DSO).

The Hub consists of two websites. A **public website** addressed to the households and a restricted area website for policy makers and DSOs. In the public website, the householder inputs data on the building/dwelling, renovation intention and family composition. When completing this online questionnaire, the householder receives a comparison of the energy consumption of the home to the benchmark, the average energy consumption of the same type of house and family. At present, three public websites can be found online for Genk city<sup>2</sup>, Eandis<sup>3</sup> and Infrac<sup>4</sup>.

The **restricted** area offers a **GIS visualization** at building level and area level (block, district, city, region, etc) of the data available and also includes a statistics section where the data can be downloaded. This website is available to the owners of the public websites (in this case Genk city, Eandis and Infrac DSO officials) and website allows them to extract intelligence out the data.

The user can query the data by combining different type of features and functions like filters (See Figure 3).

<sup>2</sup> [Genk.zetjewoningopdekaart.be](http://Genk.zetjewoningopdekaart.be)

<sup>3</sup> [Eandis.zetjewoningopdekaart.be](http://Eandis.zetjewoningopdekaart.be)

<sup>4</sup> [Infrac.zetjewoningopdekaart.be](http://Infrac.zetjewoningopdekaart.be)

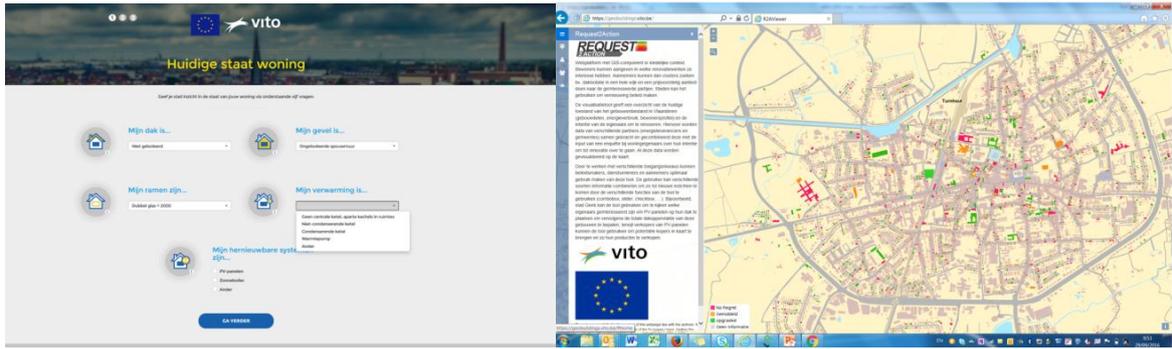


Figure 3: The public website (for households) on the left and a private users' website on the right

After consulting the stakeholders the possibility to visualize other geo-referenced data is under evaluation. This would allow to monitor local housing and energy efficiency policy programs (targeted subsidy schemes, priority neighbourhoods, etc.). The platform was evaluated useful to promote collective renovations and to improve policy making. Data confidentiality was a point of attention which is carefully observed in the private and public sections of the hub to comply with the last General Data Protection Regulation.

Genk city launched their public website for collection of information during the month of March 2017. The two regional DSOs, Eandis and Infrax, have also adopted the city portal within their BENOveren campaign<sup>5</sup>, funded by the Flemish government.

Eandis published their zet je woning op de kaart mid April 2017. Infrax published at the beginning of June 2017 their zet je woning op de kaart also linked to their BENOveren campaign (Figure 4)

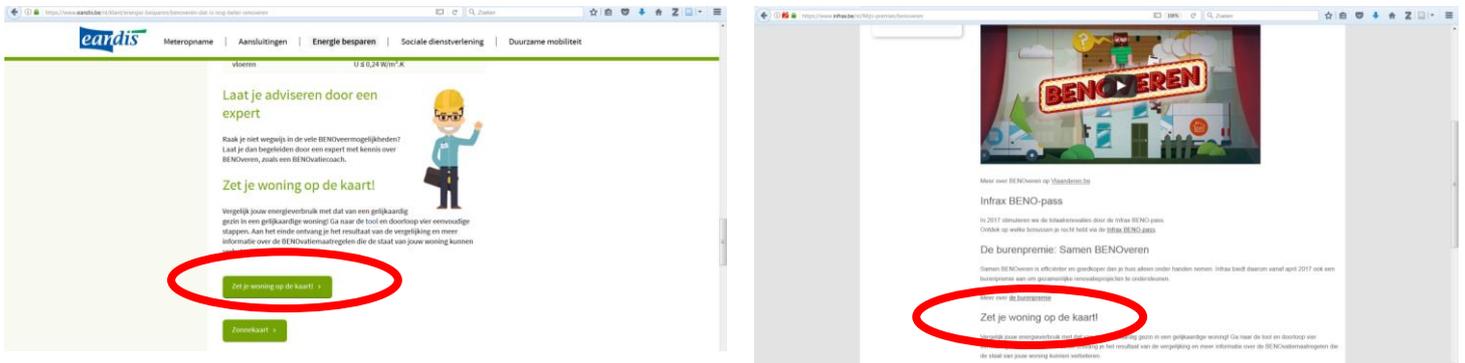


Figure 4: Link to zet je woning op de kaart in Eandis and Infrax websites

## 2.2 Stakeholders involved

The main stakeholders engaged were:

- Municipalities: Gent, Leiedal, Kortrijk, Antwerpen, Leuven, Brugge, Mechelen, Hasselt, **Genk**, Kortrijk
- Distribution System Operators (DSOs): **Eandis and Infrax**
- Leuven Klimaatneutraal, VVSG, LNE, Ordina, ListMInut, Firewolf, SamenGroen, iChoosr, VVSG – Association of Flemish Cities and Municipalities, LNE – Flemish Governmental Department

## 2.3 Input from the stakeholders

With the Flemish Smart Energy City Network (STEP UP) VITO established coaching trajectories based on an update on ongoing initiatives on housing renovation in various Flemish cities: all Flemish cities have similar ambitions for upscaling retrofit activities and face similar challenges in the process. Learning from each other in terms of strategy was found to be particularly valuable. Also, the possibility to exchange tools that are being developed was examined in order for cities to group their resources thus avoid spending money on developing similar tools and instruments in parallel. Therefore cities found the Hub concept particularly valuable.

Two levels of the Hub were discussed:

<sup>5</sup> BENOveren, dat is nog beter renoveren!: BENOveren is even better renovation!

#### 1. Public web platform:

- Raising awareness with citizens and informing them on the benefits of energy saving renovation
- Creating a city and district dynamic around housing energy saving renovation
- Cities agree that the R2A HUB components need to be embedded into the existing web platforms already set up by the cities themselves (own look and feel, and already targeting the audience)

#### 2. The housing data platform (restricted area):

- Bringing together housing data gathered by various parties into one common platform
- Collecting additional housing data by means of tools on the public web platform
- The housing data platform will allow cities to improve their housing and energy efficiency policy programs (targeted subsidy schemes, priority neighbourhoods etc)
- The platform can be used to monitor progress in the field, e.g. on an annual basis

Suggestions for further improvement of the HUB concept:

- Further clarification needed on the public and restricted access components: what will exactly be developed
- Further clarification needed on the graphical user interface and on the look and feel
- How to ensure reliability of data provided by households?
- In order to make the concept as successful as possible, coupling is needed with various services provided by cities and also by third parties on the city territory. This is a complex operation and it is unsure whether this can indeed be achieved.

According to DSOs, the ratio for the Platform is that more than half of the Flemish homes date from before 1970s and, at that time, buildings were not insulated at all. This campaign focuses on boosting renovation and to greatly improve the energy performance of the building stock<sup>6, 7</sup>.

## 2.4 Evaluation from the stakeholders

Genk city is interested in using the city portal for the renovation campaign specially addressing electric heating they will start in October this year. Therefore, this intermediate period is used to collect the information on the building stock. The city has planned other marketing activities to ensure a larger market uptake before October:

- Publish an article in the city magazine
- Promotion on the city website
- Google advert/facebook campaign in September 2017
- Dedicated leaflets designed by the district developers
- Info sessions on collective renovations/energy scans campaigns for electrical heating
- Nudging actions are under consideration

Several employees of this municipality evaluated the city portal functions with **enthusiasm**. Genk city also proposed some visualization upgrades which are currently taking place.

In the short time of operation of Hubs developed for the DSO (April-June 2017), neither Eandis nor Infrac have started a full use of the city portal. A complete evaluation from Eandis and Infrac DSO has not been received yet.

Suggestions were received particularly on the benefit of the household when completing the questionnaire which appears limited at the moment. Actions are currently ongoing to enhance the quality and the graphical appeal of the energy benchmark. The inclusion of other geo-related data is under evaluation. Eandis and Infrac have data on previous subsidies for renovation which could be included in the Hub. VITO has also requested permission to include data on the solar potential of the roofs in Flanders. In parallel, Genk city is planning to take aerial thermographic pictures in the near future which could be processed and made available in the hub categorizing the roofs according to insulation level.

## 2.5 Impact and further development

During this year and in collaboration with the DSOs, the hub will be also linked to another VITO tool delivering online tailor-made renovation advice. In this way, the household will receive the energy consumption comparison completed by a list of actions to improve it.

<sup>6</sup> [https://www.eandis.be/sites/eandis/files/documents/ik\\_benoveer\\_-\\_benoveren\\_beter\\_renoveren.pdf](https://www.eandis.be/sites/eandis/files/documents/ik_benoveer_-_benoveren_beter_renoveren.pdf)

<sup>7</sup> <https://www.mijnbenovatie.be/>

Mid-April a joint press-release of Genk city – EnergyVille<sup>8</sup> was sent out. In June, another press-release was sent out together with Infrax and Eandis. At the same time a LinkedIn article was published<sup>9</sup>. There are more than 4000 citizens since the launch.

The main reason to delay marketing actions is that the current DSO landscape is changing in Flanders; Eandis and Infrax are in the process of merging thus delaying implementation of any new tool. Marketing actions are being planned together with the new company resulting from the merge as soon as possible.

### 3. GREECE - A comprehensive one-stop-shop on energy renovation for all

- 3 Input workshops between November 2014 and March 2015
- 3 evaluation WS between June 2016 and May 2017
- 42 different stakeholders engaged all along the project duration
- Over 70 questionnaires filled during the workshops
- 7 agreements signed (plus 7 in-kind contributors displaying their Logos)

#### 3.1 Co-created service/product

In Greece the retrofit hub named “EnergyHUB for all” was developed as new and unique market place to connect demand and supply side actors as well as a meeting place and advice resource for refurbishment activities, in response to the lack of knowledge from consumers on the potential savings and benefits from energy efficiency in buildings. The Hub aims at increasing trust and establishing a good reputation for the EPC systems among building owners, tenants, suppliers and other market actors. Information on issued EPCs, energy categories statistics, energy data on type and age of buildings at a regional level is provided. (See Figure 5)

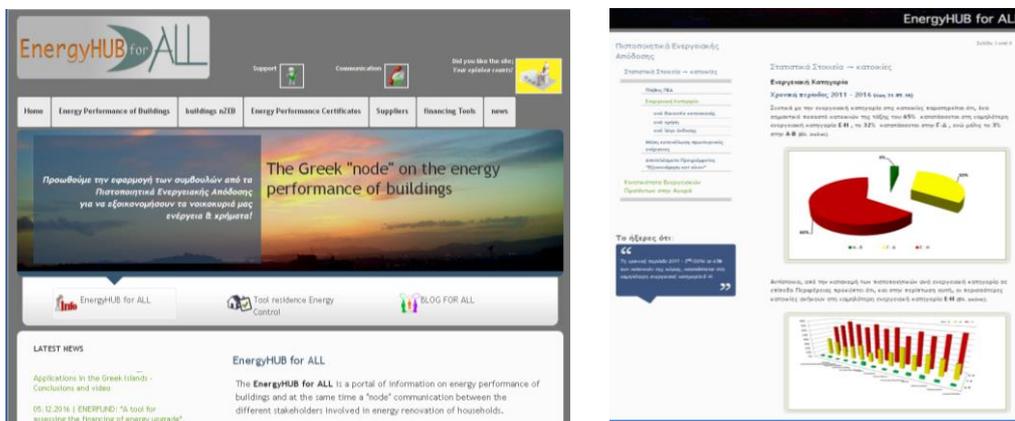


Figure 5: The R2A “EnergyHUBforALL” in Greece

A wide range of actors have guided the design of the content, layout, and structure of the websites. Manufacturers’ associations and service/product suppliers are committing to build durable supporting networks. On return they benefit from visibility and marketing. A Home Energy Check tool, giving advice to the homeowner on the energy performance comparison and potential of their homes, is embedded in the hub and is estimated to stimulate 1% homeowners to take action on renovation.

The “EnergyHUB for all” was launched in December 2015.<sup>10</sup>

<sup>8</sup> <http://www.energyville.be/nieuwsbericht/zet-je-woning-op-de-kaart>. EnergyVille is an association of the Flemish research institutes KU Leuven, VITO, imec and UHasselt in the field of sustainable energy and intelligent energy systems <http://energyville.be/en>

<sup>9</sup> <https://www.linkedin.com/pulse/city-portal-genk-marlies-van-holm>

<sup>10</sup> <http://www.energyhubforall.eu/>

### 3.2 Stakeholders involved

Approximately 43 different stakeholders have been engaged: energy inspectors and consultants, suppliers, market operators, property owners, representatives of local authorities, students, state officials, etc.

100 people attended the input phase and more than 144 (90+23+31) engaged in the evaluation (building owners: 36%, Professionals:28%, Suppliers:24%, Local authorities: 5%, Policy makers: 3%)

See complete List in Annex 1

### 3.3 Input from the stakeholders

Stakeholders involved evaluated good examples of building energy renovation (15%) and innovative energy efficient products and technologies (15%) as priority issues to be included in the Greek Retrofit Hub. Other issues:

- Useful data and information regarding the evolution of Energy Performance Certificates, their annual distribution, the reason of their issue, the percentage distribution of energy classes, NZEBs, etc.
- RES applications in buildings (10%)
- Financial support instruments (10%)

But also, the latest legislative framework for energy efficiency in buildings, voluntary initiatives, training and education (construction skills), bioclimatic architecture, detailed analysis. Stakeholders agreed

- EPCs are an important tool and their role (energy recommendations) is widely accepted (manufacturers, suppliers, owners).
- EPCs and their suggestions must be further explained and people familiarized with energy renovation solutions and their impact (need for a HEC, developed by CRES within R2A and included in the “EnergyHubforALL”.
- The financing of the EPCs recommendations is an important issue: the associations claim for more incentives for energy renovation actions and the government for a wider involvement of private resources.
- There is need for market surveillance and checks of the assurance of good installation of the renovation measures.

### 3.4 Evaluation from the stakeholders

At the June 2016 evaluation workshop at the Ministry of Environment and Energy a questionnaire was distributed. Twenty three (23) participants (on 85) answered the questionnaire and an analysis of responses is presented below. 87% respondents found the information they expected and learned something new and useful from the retrofit Hub. The other results are illustrated below.

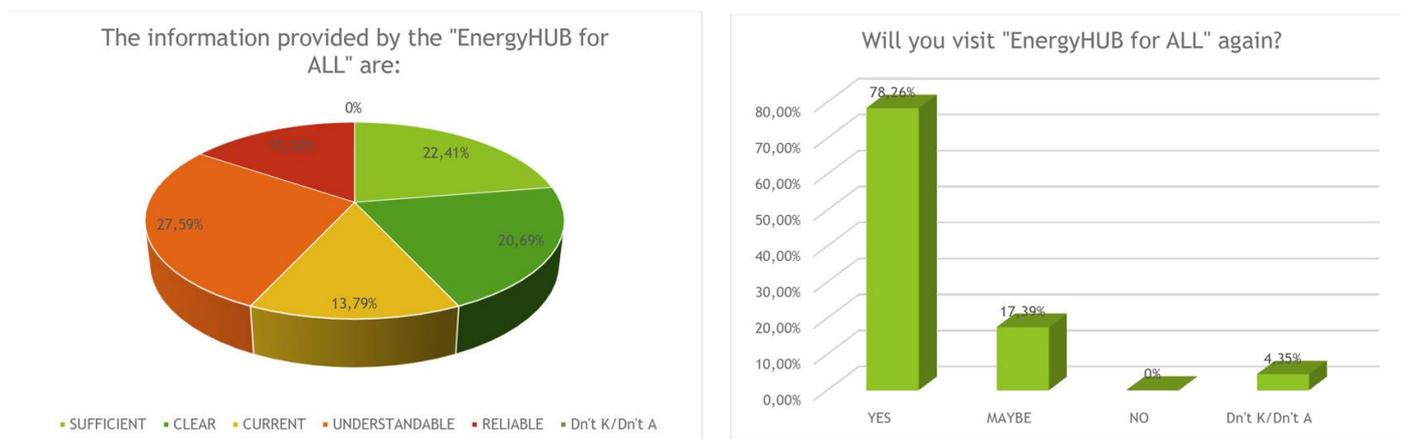


Figure 6: Appreciation survey of the R2A “EnergyHUB for all” Hub in Greece (June 2016)

74% respondents will definitely recommend 'EnergyHUBforALL' to a friend or colleague and only 26% maybe. The majority of respondents learned about the "EnergyHUBforALL" from a conference or event, 17,2% from the search engine and 13,8% by the press or an article in a magazine. In smaller percentages, the respondents were informed by another website or were recommended by a friend.

The frequency of visits, replying to the question “Which page of 'EnergyHUBforALL' have you visited more (1 is for not visited at all - 5 very frequently)” is shown in the following graphs (Figure 7).

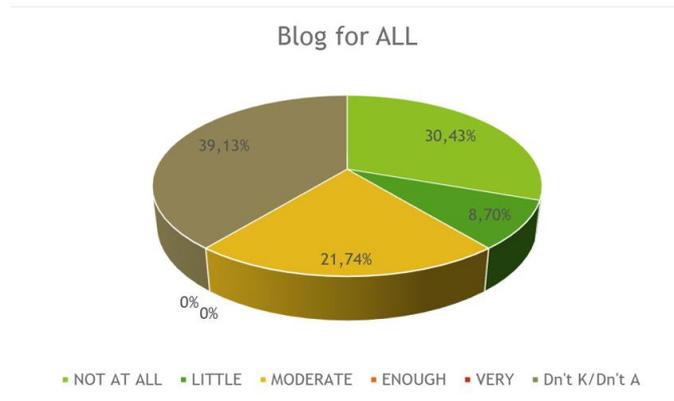
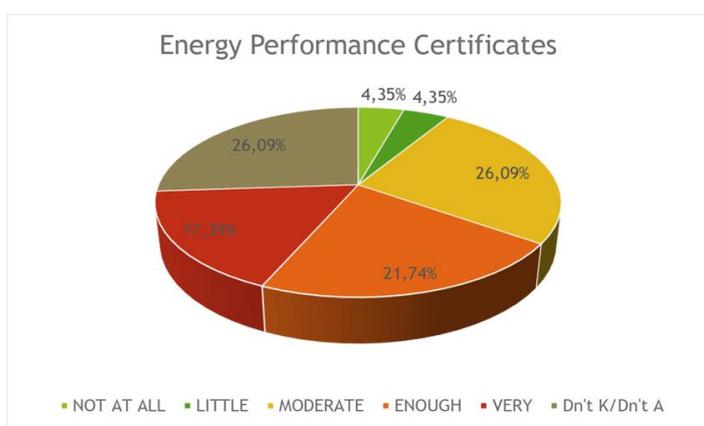
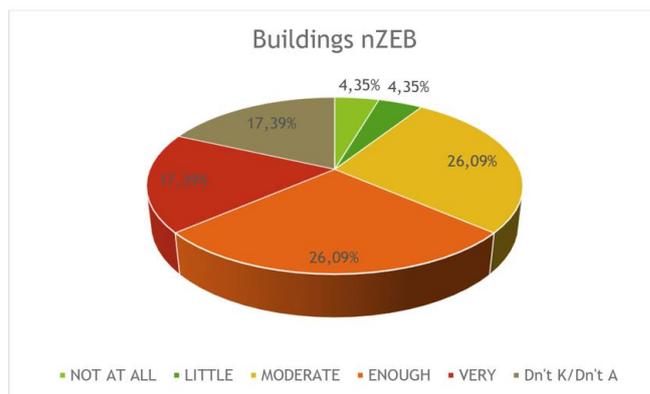
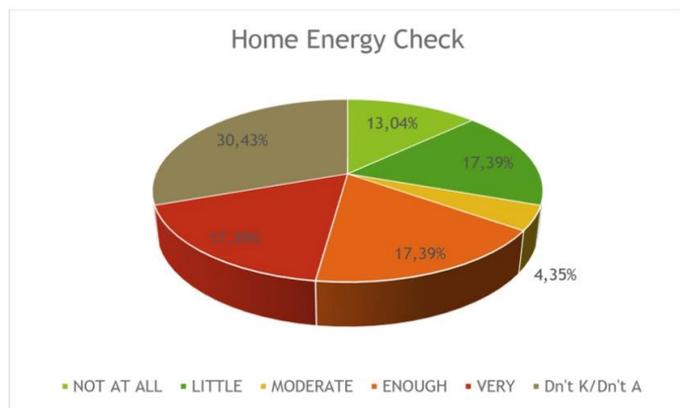


Figure 7: Frequency of visits of the R2A “EnergyHUB for all” Hub (June 2016)

Beyond the overall general feedback on the Hub stakeholders pointed out some areas that need some improvement or change, such as the field “News/Communication” and “Blog for ALL” and the expansion of information at European level applications.

The final evaluation occurred in May 2017. Actions taken through the Greek R2A HUB and HEC were presented and discussed together with the objectives, structure and other outcomes of the Request2Action project and useful data and information regarding the evolution of Energy Performance Certificates in the energy efficiency of buildings, their annual distribution, the reason of their issue, the percentage distribution of energy class of buildings to date, etc. (that is comprised in one of the Hub sections).



Figure 8: Greek Hub 3<sup>rd</sup> Evaluation workshop (Athens, Crowne Plaza, May 2017)

Along the workshop, two questionnaires were distributed. It was completed by 31 participants (on 55) and the analysis of the answers is presented below. A 77% of the participants found the information from the workshop useful for a future energy renovation of their house. A 71% of the responders answered that they “would you be interested to participate in future actions of the European project Request2Action, a 23% answered that it is probable. 43% say that the structure and the content of the Hub are satisfactory, 57% think it’s easily accessible. It is interesting to highlight that only 24% responders were aware of other platforms s (national, regional, local) dedicated exclusively to energy efficiency and the renovation of existing buildings. 20 out of 21 Companies are willing to contribute to the further development and dissemination of the EnergyHUBforALL, The would suggest EnergyHUB for ALL to their network members (43%), connect EnergyHUB for ALL to their website (19%), disseminate news, data, information and events published on EnergyHUB for ALL (19%), and finally they would provide data and information for publication in the EnergyHUB for ALL (14%). Other answers to the questionnaires are shown below (Figure 9).

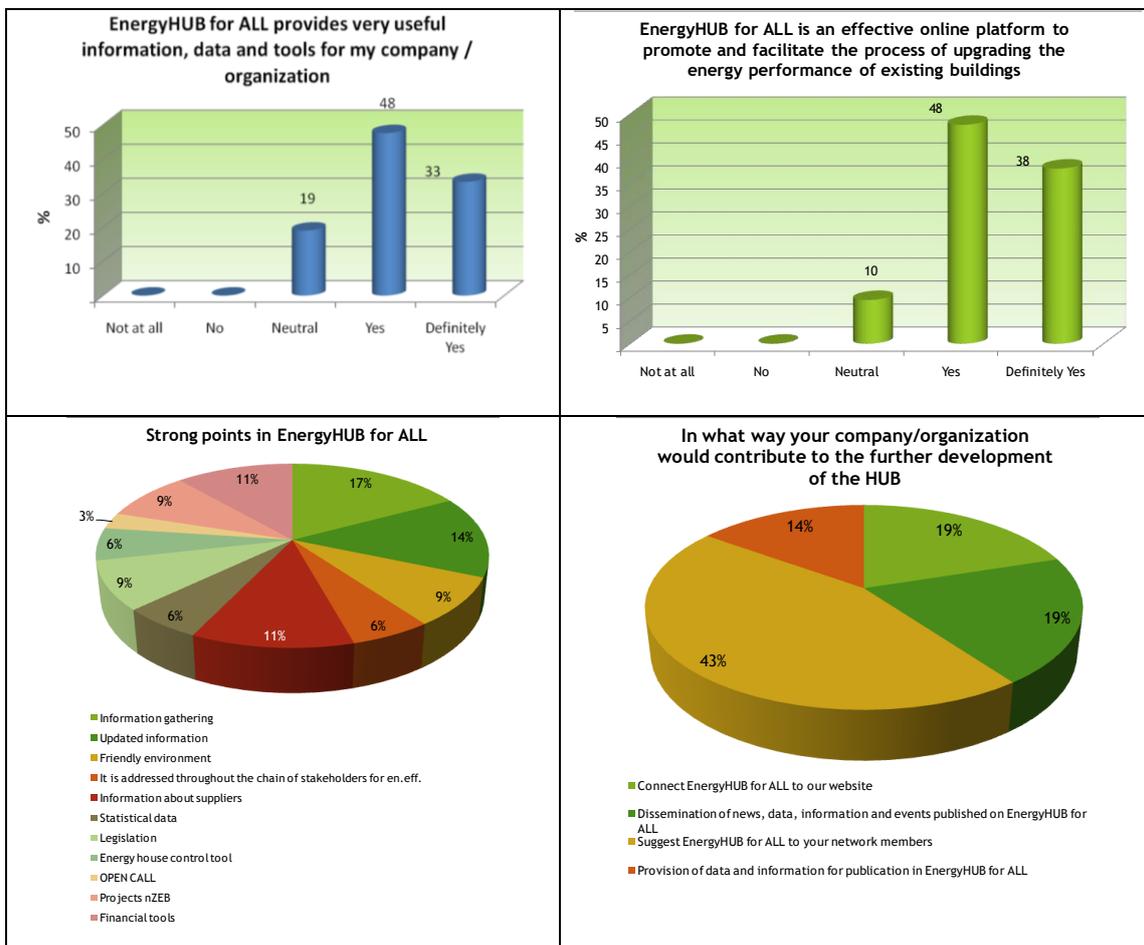


Figure 9: Appreciation survey of the R2A “EnergyHUB for all” in Greece (June 2017)

### 3.5 Impact and further development

After a year and a half from the launch, “EnergyHUB for All” has more than 7.800 unique visitors and 13 official supporters from the building market, government and local authorities, NGOs for sustainable and energy efficient buildings, energy consultants, and the technical press.

Six national associations signed agreements with CRES to contribute to technical information and best practices. In the blog area of the Greek Hub, they can also provide advice to homeowners under CRES’s auspices. Research institutes, energy magazines, ESCOs are interested in contributing too. CRES will carry on liaising with the association involved to get information regarding the energy efficient solutions.

CRES will try to attract all possible associations related with building energy efficient products. More specifically, engaged associations-energy auditors-stakeholders will benefit from the use of the HUB by promoting their products and services (their Logo is displayed in the website). They will also provide consulting services to homeowners in the blog area which is under CRES’s auspices.

## 4. ITALY – A Portal to improve access to building data and promote renovation

- 5 Input workshops between October 2014 and August 2015
- 5 evaluation workshops between December 2015 and May 2017
- 56 different stakeholders engaged all along the project duration
- 14 questionnaires filled by the stakeholders
- 1 agreement (ILspa Lombardy) and 5 associations committed to contribute to the Hub (LOGOs displayed)

### 4.1 Co-created service/product

In order to improve insight on energy performance of the building stock, Italy undertook the harmonisation of regional EPC systems through the consultation of managing authorities. A new harmonised system (SIAPE) will produce statistics on raw and aggregated open data, allowing consumer’s but also policy makers’ awareness. Moreover, interoperability of the EPC registers with other databases has been investigated.

Early brainstorming in the project demonstrated that consistency of EPC data and interaction with other territorial data were missing. Moreover a simple visualisation allowing user friendly access from local authorities and private actors was needed. Thus ENEA developed a tool (named DIPENDE)<sup>11</sup> based on integration of EPC data with the national Census and governmental building renovation incentives data, establishing a relationship between estimated energy performance in EPCs, recent systems and building product/service installation, climatic and social data. The DIPENDE database is made of nearly 70 records for each of the 1500 municipalities in Lombardy region so counting more than 105.000 data. The information was aggregated at municipal level and released as an excel-based analysis tool and as a webGIS.

Main specifications for the tool were: interoperability of the datasets that imposed the chosen scale (retrofit and installations are available as an average at municipal level so far), standardization of the analysis and setting up relevant queries and easier-to-interpret categories.

A retrofit Hub ([www.portale4e.it](http://www.portale4e.it)) has also been created within the R2A project in Italy as a new and unique market place to connect demand and supply side actors as well as a meeting place and advice resource for the different targets, into 3 sections: Citizens (R2A Home Energy Check tool “4ECasa” and a “vademezum” on the EPC have been developed on purpose in this section), Enterprises and Professionals, Local Authorities (DIPENDE and other useful information are included in the LA section).

<sup>11</sup> [http://www.portale4e.it/centrale\\_dettaglio\\_pa.aspx?ID=1](http://www.portale4e.it/centrale_dettaglio_pa.aspx?ID=1)

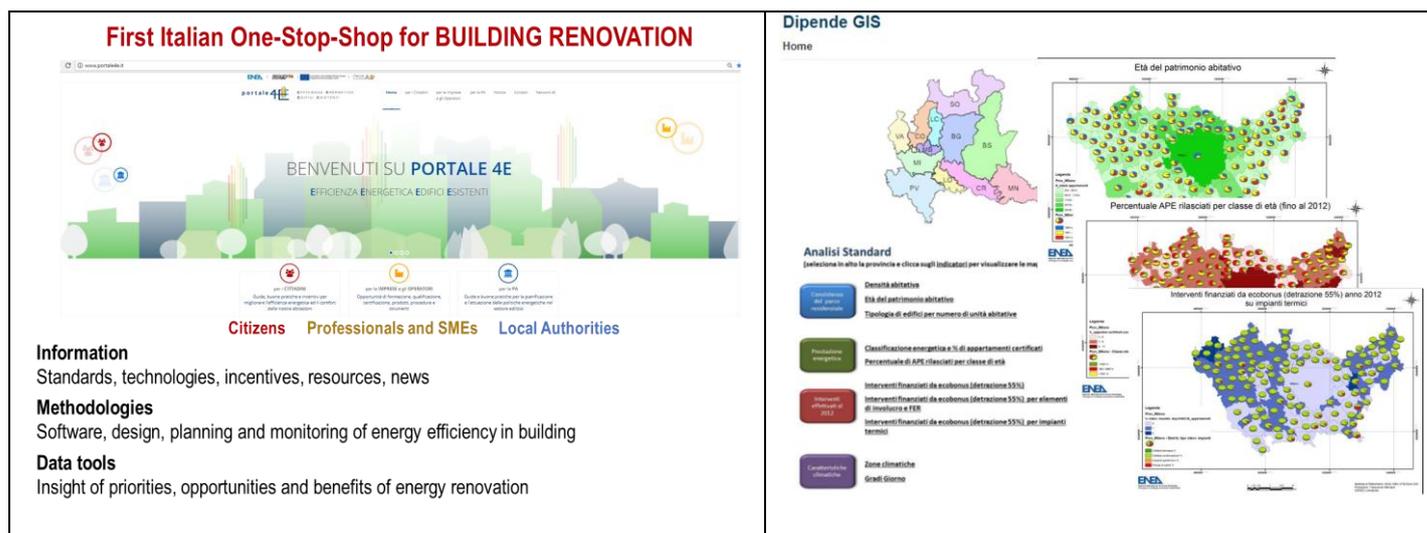


Figure 10: The R2A Retrofit Hub “Portale4E” and the “DIPENDE” energy planning data tools developed in Italy

## 4.2 Stakeholder involved

For **DIPENDE** data tool, supporting local energy planning:

- ILspa,<sup>12</sup> Lombardy region in house society acting as a regional energy agency, have a long-lasting experience in managing the EPC register, - a nearly 2 million EPCs totally open database. Before the R2A project ILspa had already combined EPC data with the cadastre of building technical heating systems and the ground source heat pumps cadastre into a wider information system for energy and environment (SIRENA20) that feeds and updates the regional energy balance, the emission monitoring system and supports energy policies.
- The in-house agency from Liguria region, IRELiguria,<sup>13</sup> the ENEA unit responsible for developing the centralised national EPC database and managing the EPC database in Abruzzo and Lazio Regions were also engaged since 2015.

A wider audience of regions/local authorities was looked for during two events focussing local energy planning (in April 2016 at the Polytechnic of Turin and in May 2017 at ENEA headquarters in Rome).

**A wider range of actors** have guided the design of the whole retrofit **Hub “Portale4e”**, mostly trades and professional associations. (See the complete stakeholders’ list in Annex1)

## 4.3 Input from the stakeholders

In a first consultation phase (2014-2015) ILspa and Liguria (IRELiguria) shared their experience while ENEA presented the first attempts in EU on wider use of EPC databases to monitor and plan building retrofit. The definition of requirements and replicability of the DIPENDE pilot occurred during 5 input workshops. ILspa carried out a study, applied to a sample of two municipalities,<sup>14</sup> on the effectiveness of analysing recommendations and EPC issued “before and after renovation” to assess actual retrofit and estimate savings. The study highlighted the limited chance to track actual retrofit without integration of several sources of information, notably incentives accessed and reference to the whole stock rather than units with an EPC (nearly 30% of the total).

The consultation resulted in:

- EPC data at address level checked/furtherly made available from ILspa.
- Analysis of indicators revealing possible retrofit both at address level and aggregated at municipal level.
- IRELiguria expressed their interest in such a tool since “driving retrofit insight from EPC data is still at early stage”. Moreover they stated: “The DIPENDE tool, integrating different databases (Census, EPC, Tax deduction incentives) as presented during the meeting in May 2015, could improve the knowledge of the regional building stock and actions to be planned to improve its performance and match climate targets”. Nevertheless the consistence and liability of data from EPC was raised.
- Use of the DIPENDE tool by/for other Regions could depend on the development of the SIAPE system (national EPC information system) launched in 2017 and managed by ENEA (regional offices coordination unit).

<sup>12</sup> <http://www.ilspa.it/home>

<sup>13</sup> <http://www.ireliguria.it/>

<sup>14</sup> ILspa, “Analysis of EPCs in Bergamo and Varzi (PV) aimed at tracking retrofit and assessing savings”, confidential document, August 2015

Attention to R2A Hub “Portale4e” concept had already been met during the first REQUEST project (2010-2012) and was confirmed during the kick-off of the project in Italy, attended by 65 participants.<sup>15</sup>

Such a thematic hub was missing in Italy and ENEA, in their role of national agency supporting the Government in EE policies, is trusted by stakeholders for providing impartial insight and data on energy performance of the building stock and on cost-effective retrofit measures.

More data on EPCs and incentives was also requested in the legislation being drafted in that period.<sup>16</sup>

Support and advice for consumers through an HEC, a simple test on home consumptions, was particularly welcomed.

#### 4.4 Evaluation from the stakeholders

The DIPENDE excel-tool was delivered to ILspa in October 2015, with the following positive feedback from after their first test: “The application offers useful insight at regional, district, municipal level, and allows the user to characterise the stock also taking into account representativeness of energy data, to estimate retrofit measure implementation trends, and to select priority areas for action”.

As a result of this first application some thematic maps and a report were drafted by ILspa.<sup>17</sup>

The main comments in the report were:

- Social and general data are useful to normalise other data and create meaningful indicators
- Integration provides new attributes to building units that can complement the EP analysis: keeping in mind that EPCs are issued at building unit level in Lombardy, integration of Census data allows for visualisation of areas where building blocks prevail or areas with prevalent temporary holidays units or type of the building Technical system
- Integration of incentives proves real uptake of EE measures and market trends and allows for saving estimation. However the incentives data need to be updated.

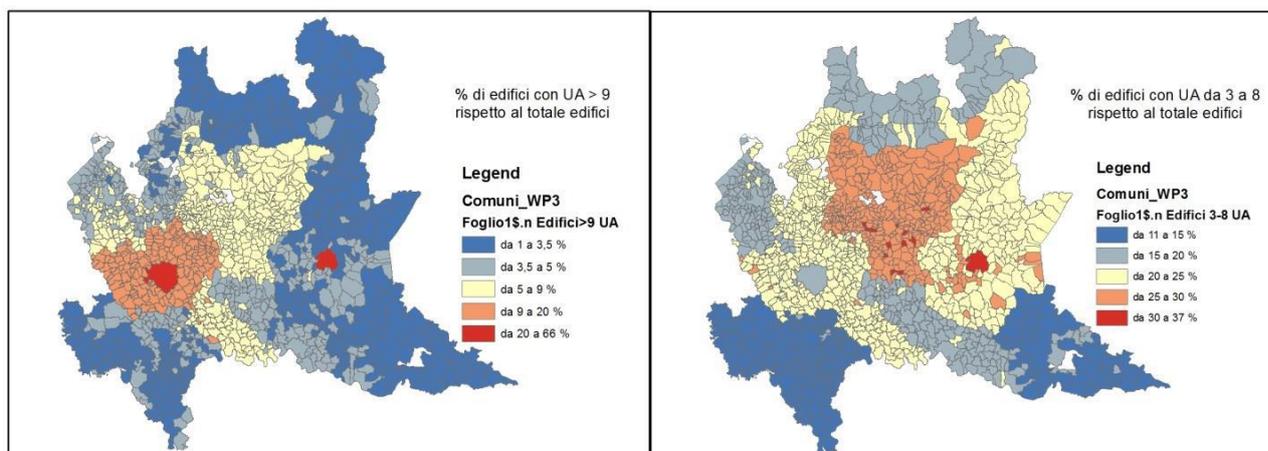


Figure 11: ILspa Geo-referred analysis based on the use of the DIPENDE excel tool (building typology by number of building units)

As a follow up ENEA developed the DIPENDE standardised analysis, based on ten complex indicators that were illustrated through GIS maps and a webGIS (both would be made available on the R2A retrofit Hub “Portale4e” in May 2017).

<sup>15</sup> “Efficienza Energetica degli edifici ... il contributo degli stakeholder”, ENEA, 1 October 2014, <http://www.enea.it/it/comunicare-la-ricerca/events/request2/EFFENEEDFICI>

<sup>16</sup> New 2015 EPC guidelines according to the EPBD recast in Italy, were published in June 2015, <http://www.mise.gov.it/index.php/it/normativa/decreti-interministeriali/2032968-decreto-interministeriale-26-giugno-2015-adeguamento-linee-guida-nazionali-per-la-certificazione-energetica-degli-edifici>

<sup>17</sup> ILspa WG Morimondi, Frigerio, De Simone, Feedback to REQUEST2ACTION WP3 datatool”, January 2015 (confidential report to ENEA)

The first version of the **Retrofit Hub Portale4E** was presented through a webinar in April 2016, at the time when the Hub was embedded in the ENEA energy efficiency unit website. A trade federation, a trade association, 2 professional associations and a social housing company tested the platform and filled an online questionnaire (1-5 score rating).

Even before the availability of the HEC 4ECasa for citizens and of the DIPENDE web-GIS, the content of the Hub (information on software, financial instruments, retrofit advice to consumers) was judged satisfactory (60% respondents rated it 3, and 40% 4 and 5), the information, data and tools available on the Hub were judged useful to the daily work of consulted stakeholder (40% rated it 5 and 40% 3-4).

The participants to the survey asked for more info on best practices of deep renovation and NZEB, but also for a focus on cooling and innovative retrofit techniques.

Other issues required by the Stakeholders:

- Links to other networks and information on results of EU or international projects (done, in the new version)
- Focus on multiple EE benefits (comfort, business models, savings )

These associations have finally committed in collaborating for further development and declared themselves keen to build a durable network supporting the Hub.

The stakeholder feedback has led to a restyling (a software house has been subcontracted to provide a new web version of the Hub, "Portale4e.it") while the structure (the 3 target sections) has remained almost unchanged. The content has been enriched with the R2A data-tools (4ECasa and DIPENDE) and with the construction of pages that take into account the stakeholders' needs.

The final R2A Hub, and in particular the section for Local Authorities and the DIPENDE webGIS, were presented on 22 and 24 May 2017, mainly to public administrations, utilities and academia, during two events dealing with support to local energy planning<sup>18 19</sup>.



Figure 12: Italian stakeholder evaluation workshop and working groups (ENEA Rome, 22nd and ForumPA, Rome 24th May 2017)

<sup>18</sup> "Local Energy Planning – Lanche of ALEP-I-Net, ENEA headquarters, 22 May 2017, [http://www.enea.it/it/comunicare-la-ricerca/events/alep-i-net\\_22mag17/ENEA-Roma](http://www.enea.it/it/comunicare-la-ricerca/events/alep-i-net_22mag17/ENEA-Roma)

<sup>19</sup> Forum PA 2017, La Nuvola - EUR Rome, 24 May 2017, <http://forumpa2017.eventifpa.it/it/event-details/?id=5488>

Further to five positive evaluation questionnaires on DIPENDE, main comments received were:

- By an ESCO association: “ESCOs provide consulting to Local Authorities on energy plans and strategies: GIS tools and easier access to building big-data can provide for evidence of social and environmental issues and higher awareness in decision making”
- By Local Authorities and Academia/research; “Quality, update, interoperability of databases are the main barriers to a unique and harmonised modelling and planning methodology”.

The DIPENDE tool was hence welcomed as for the data structure/integration. The data presentation format may be further improved, by permitting, for example, the display of main simple data rather than of 10 complex indicators in the webGIS.

Participants to 22<sup>nd</sup> May workshop agreed to share good practice on local energy planning through a network (the ALEP-I-NET) that can be facilitated by the Hub.

#### 4.5 Impact and further development

A gentlemen’s agreement has been signed by ILSpa for the use of DIPENDE in 2016. Other regions are interested in a new application of DIPENDE. The new national database for EPCs managed by ENEA (SIAPE) can endorse wider application in up to 15 regions in the short-term. Reorganisation of the growing amount of data in ENEA will result into a *Regions’ Integrated Territorial Platform* that could display data at address level (mainly for Public authorities).

The official launch of “Portale4e” hub occurred on 6th July 2017 through a press release. The launch resulted in an initial increase of 500 contacts daily. After a week from the official launch the Hub has around 600 unique users (200 registered to 4ECasa) and 2,088 unique page views.

Following the request for information and guidance on nearly zero energy Buildings and financing some dedicated pages are being developed and a project to build an “Italian Observatory of NZEB” on the R2A Hub has been recently presented to MISE (competent Ministry) for funding.

Recent messages to Portale4e from users demonstrate high interest for the 4ECasa (Home Energy Check for consumers) and suggest an App extended with summer consumptions.

Further development of Portale4e is in the annual plan of the Italian PIF (national *Programme of Information and Training*) funded by the government and implementing article 12 of EED.

A workshop to re-launch the Hub and increase the supporting network is predicted in Fall 2017.

## 5. THE NETHERLANDS – Involving banks to verify use of EPC to issue loans

- 4 Input workshops between July 2015 and June 2017
- No evaluation workshop (the data tool was not developed)
- 9 different stakeholders engaged all along the project duration
- 8 questionnaires filled by the stakeholders

### 5.1 Co-created service/product

Enterprise Agency (RVO) in the Netherlands currently supports consortia of local authorities and market actors to improve the performance of dwellings adopting new ways of financing. RVO also manages the central EPC database and is involved in several national revolving funds. **Banks and financiers** were engaged to explore reputation of the EPC to the aim of providing independent advice to homeowners on how to use their savings to co-finance energy efficiency measures and issue loans. Beyond the present on-line information to the owner, a new “budget planner” on the website was suggested to inform homeowners on available financial products to uptake energy efficiency measures.

### 5.2 Stakeholders involved

Eight Banks. Key players: Rabobank, SNS bank, Triodosbank, ABNAMro and SvN bank.

### 5.3 Input from the stakeholders

The results of the methodology comparing actual and calculated EPCs (WP2) were presented by NL RVO as a cue for the R2A data pilot. Input to data pilot was provided in a workshop for financiers, for both investments in energy efficiency measures and for the

specific role of energy efficiency within the processes of issuing loans. Presentations were provided by Dirk Brounen, professor of Real Estate Economics both at Tilburg University and TIAS and specialised in the risk and return of real estate investments, from Nibud and RVO.

New energy label (EPC), introduced on 1 January 2015, had a good start: more than 75% of sold homes has an EPC. That is a challenge for banks to use the EPC in their financial relationship with customers. Results of EPC methodology delivered further support for investments in energy efficiency within home mortgages: real energy savings are lower than theoretically calculated, but give a better and real basis for decisions on taking energy efficiency measurements.

Savings a year, variabel costs of gas €0,60; only privatsector, same houses

		To:					
		A	B	C	D	E	F
From:	A	€ -	€ -	€ -	€ -	€ -	€ -
	B	€ 127	€ -	€ -	€ -	€ -	€ -
	C	€ 223	€ 96	€ -	€ -	€ -	€ -
	D	€ 339	€ 212	€ 116	€ -	€ -	€ -
	E	€ 409	€ 283	€ 187	€ 71	€ -	€ -
	F	€ 548	€ 421	€ 325	€ 209	€ 139	€ -
	G	€ 623	€ 496	€ 400	€ 284	€ 214	€ 74

Figure 13: RVO - Actual economic savings according to “jump” from one label class to a better one

The NL pilot was predicted to result in the improved role of energy efficiency in credit legislation, based on real data on energy savings and lower energy bills. Nevertheless the main feedback from stakeholder engaged was:

- There is no need for extra mortgage for investments in energy efficiency
  - Many mortgages are lower than the maximum Loan to Income
  - Lack of money doesn't seem to be the problem
- More attention should be paid to investments in energy efficiency within the maximum Loan to Value, instead of extra loans which could create greater risks.
- The results of research on higher selling prices of energy efficient houses have to be taken into account
- Effects on comfort are also to be considered

Moreover:

- There is a need for independent advice and information
- Improving the energy efficiency of the mortgage stock will lower the financial risks for both banks and home owners
- Comparing the mortgage stocks of banks, based on energy efficiency or energy label

Following the first WS, some more 3 meetings with NVB, National Dutch Branch of Banks climate in November 2015 confirmed the trend for a **bigger role for banks in facilitating energy efficiency.**

The participating banks could share and discuss the experiences they had with facilitating homeowners to improve the energy quality of their homes. It is planned to perform this kind of workshops for banks regularly from now on (on a biannual basis), together with the Dutch Banking Association NVB.

The information shared in these workshops are:

- The green premium on selling prices of houses with green label A, B or C. This information is based on studies of Tilburg University.
- The effect of energy efficiency on credit risks of mortgage portfolios. This information is based on studies of Tilburg University

- The way of facilitating home owners to invest in energy efficiency, based on the approach of an intermediate company that functions as a one-stop-shop. Based on experiences of Triodos Bank and the intermediate party Susteen.
- The Banks informed each other about their own approaches help homeowners how to improve the energy quality of their homes.
- At least four banks have analysed the energy efficiency of the their total mortgage portfolio, based on the EPCs of the individual houses. These banks are ABNAMRO, SNS bank, Obvion bank and Rabobank. The results will help these banks to facilitate the homeowners to improve the energy quality of their homes.
- Obvion bank informed the other banks on their new approach of issuing Green Bonds, based on green residential mortgage-backed security (RMBS). The mortgages in this Green Bonds consist of homes with label A or homes wich have been improved to at least energy label C. The first Green Bond of 500 million was issued in June 2016; the second will be issued this year.
- ASN bank didn't offer mortgages until now, but this bank is developing a new mortgage product at the moment. This new mortgage is expected to be introduced end of 2017. New is that this financial product will be specifically designed for energy-inefficient homes, where a stimulus will be given to improve energy this house.
- ABNAMRO Bank introduced a new mortgage for energy energy efficiency. The bank offers a 0.2 percent lower mortgage rate, when homeowners buy a very energy efficient new house.
- SNS Bank has a policy to be climate neutral in 2030. To reach that goal SNS Bank invests in renewable energy, but also in trying to improve the energy efficiency of the mortgage portfolio. SNS Bank is trying different approaches through its subsidiaries to persuade homeowners to take energy saving measures. These different approaches include offering an energy saving advice to the individual homeowner, offering the facilitation by a one-stop-shop, or advice on how to get information on energy efficiency given by the intermediary mortgage advisers. But SNS Bank also offers homeowners cheap hire contracts for solar panels.
- Triodos bank already offered a mortgage for homeowners with an interest rate based on the EPC of the dwelling. The information in the Request2Action workshops gave a better foundation for this approach.
- The Dutch Banking Association NVB published their Climate Statement in November 2015. The information from the workshops will help to carry out the proposed actions in the Climate Statement. The NVB wants to cooperate in the future with organizing these workshops to facilitate the exchange of knowledge between the banks.

No service was developed to be used from the banks. So RVO kept on consulting the Banks to verify specifications and requirements for eventual services in the future.

#### 5.4 Impact and further developments

In order to reply to the question: "how can we facilitate investment in energy measures with savings of home owner?":

- Nibud is rebuilding a website for home owners, on advising how to use their savings. For example by savings on the bank, investment in stocks, or even investment in energy efficiency measures.
- A new website has been constructed for finding an advisor who can deliver a home energy check: [www.maatwerkadviesvoorwoningen.nl](http://www.maatwerkadviesvoorwoningen.nl), directly connected to the website for calculating the new energy label (EPC) [www.energielabelvoorwoningen.nl](http://www.energielabelvoorwoningen.nl),
- A new calculating tool will be encompassed in the existing website for home owners to inform them on possible ways to improve energy efficiency of their homes: the *budget planner on energy efficiency measures*.

New national governmental campaign for home owners, including a website, started in autumn 2016, learning from the R2A retrofit hubs.

The stakeholders' workshops created a new discussion group of banks on energy efficiency. The participants are keen on regularly meeting each other (twice a year) to discuss the several approaches on facilitating homeowners to take energy saving measures. The next meeting has been planned for November 2017, as a follow up for the Request2Action workshops.

## 6. PORTUGAL - One-stop-shop to promote and track actual building renovation

- 2 Input workshops between February and September 2015
- No evaluation workshop owing to delays in contracting and, hence, delivering the Hub
- 14 different stakeholders engaged all along the project duration

### 6.1 Co-created service/product

The Portuguese retrofit action hub, *Portal CasA+* aims at responding to a market gap between home owners and energy efficiency solutions providers. The goal is to develop a one-stop-shop to bring together all key players of the renovation process, promoting a closer contact between the different actors, fostering the commercial relation between demand and supply, reinforcing market trust and boosting the easier adoption of energy retrofit measures. The *Portal CasA+* hub addresses homeowners, installers, energy experts, public authorities, insurance and banking (these two at a later stage), that can further reinforce the market support to the efficient uptake of these measures.

The private area is available both for dwellers to register their homes and for suppliers to register their services. The hub builds upon the EPC database centralized information, allowing it to be enhanced and further detailed at the home owners' level. Through the hub the home owner can easily access information on the building solutions, active appliances and energy efficiency measures. The new data service will focus interaction with the homeowner to get an update on new retrofits. Homeowners will be asked to report on new retrofit measures in their houses, give feedback on installation quality and to interact with the supply chain. They will be invited to upload information relating to the energy use profile, energy and water consumption monitoring, register existing appliances, etc., fostering the creation of practical energy retrofit opportunities

Sector associations and parallel accreditation schemes are presently establishing criteria for the selection of installers/companies to be part of the platform.

### 6.2 Stakeholders involved

So far 13 main stakeholders have been involved.

- 9 Representative bodies of tradespeople and professionals:
- 2 Policy makers and Public Authorities
- Investors and developers of insurance and finance programmes and a consumer defense association DECO

### 6.3 Input from the stakeholders

Input workshops were held in May 2015 on the Hub concept and in July 2016 in Lisbon, on the overall future structure and functions of Casa+ Hub. The first was a strategic workshop to establish requirements for the R2A Portuguese Hub: All the reference questions provided by WP4 leader were addressed as a basis for the debate with stakeholders.

Issues dealt:

- Hub strengths and barriers
- Market acceptance
- Quality Policies - Qualification and Evaluation of Professionals/Installers
- Insurance and Guaranties for retrofit works
- Matching demand and supply chain (how to find clients)

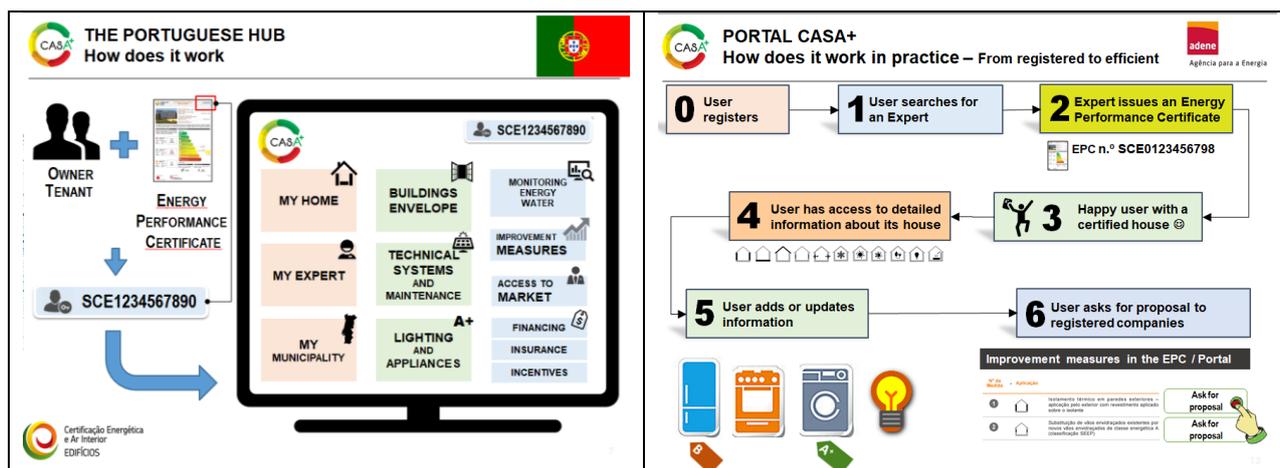


Figure 14: ADENE – The concept of ADENE Hub “CASA+”

#### Strengths of the Hub concept have been identified:

- Market acceptance: market successful examples of national generic One-Stop-Shops, such as Zaask.
- Consumer urgently needs to trust in service providers.
- Hub should be a promotion tool for the quality of works through accredited and qualified experts. Consumer with a role in evaluating work of Installers and Energy Experts.
- The role of a virtual Energy Expert: Hub as an added value to the Energy Expert, providing advanced advisement to the householder with an active role in promoting implementation of improvement measures.

#### Barriers highlighted:

- Support from sector associations and parallel accreditation schemes (with associated courses) can be an alternative.
- Insurance and Guaranties of retrofit works: Evolution is needed in the insurance market, according to installers. Insurance association available to study new products, besides the current “civil responsibility” for 5 years after work is done.
- Financing Packages: bilateral meeting needed with banking representatives, in order to analyse the best strategy (exclusivity, types of packages, agreements), and its synergies with the insurance companies.

Installers, manufacturers, banks, companies seem to be willing to assure sustainability of the Hub by paying fees on advertisements. Some municipalities committed in creating an area of access to EPC data, aimed at local energy planning. Consumers could have a role in tracking implementation of retrofit actions, by supplying data through the web, and evaluating construction works and energy experts: a market study conducted through 650 telephone calls to householders confirmed their agreement to register improvements made after the EPC issuing. According to the survey this should preferably be reported by the same expert who updates the EPC. A reduced cost for this update should be guaranteed to promote reporting on the implemented EE measures.

#### 6.4 Evaluation from the stakeholders

At the moment, it’s not possible to provide effective user’s feedback, though this will be attained through surveys deployed on the hub (throughout the different stages of interaction) to all the stakeholders involved, from home owners, to energy experts and solutions providers. Also, user’s feedback will work side by side with the EPC surveillance system to evaluate the Qualified Expert work during the EPC emission process and a large-scale quality assessment by home owners, who can edit and report on the wrong identification of building components and technical systems

#### 6.5 Impact and further development

- Market qualifications and criteria for selection of installers/companies allowed being part of the platform.
- Finding Clients: there is the need to attract homeowners to the platform with a strong marketing and communication strategy. Work also needed on incentives for signing in
- Hub financial sustainability: advertisement from participants (installers, manufacturers, banks), registry payment by companies, or “success Fee” for each asked or accepted budget.

- Agreements: there were no specific declaration signed by stakeholders, but every stakeholder compromised verbally in cooperating with the R2A project, and future agreements and protocols will be established.
- Starting engagement of Municipalities to create an area of access to EPC database, useful for local energy planning.

The lessons learned through the stakeholder engagement process are:

- the critical importance of involving trade associations, to reinforce commercial partnerships, more easily access the market and achieve a critical mass of suppliers in the hub;
- Need for transparency and precision on the platform user's policy, namely regarding data protection issues.
- Potential uses for planning.

## 7. SLOVAKIA – Engaging with cities to improve building data

- 1 Input workshops in June 2015
- 1 evaluation workshop on 25th May 2016
- 45 cities engaged all along the project duration
- 50 questionnaires filled by the attendees to the workshops

### 7.1 Co-created service/product

The Slovak Innovation and Energy Agency (SIEA) worked with the Union of Towns and Cities of Slovakia (UTCS). 55 cities that adhere to the Covenant of Mayors have asked support in developing and handling data on energy performance and building retrofit roadmaps. A detailed questionnaire filled by these municipalities and the following discussion during the Request2Action workshops evidenced specific shortage of information (e.g. energy performance of buildings and their components, number of retrofits or NZEB) that can be solved by using EPC data owned by SIEA.

### 7.2 Stakeholders involved

45 representatives from municipalities, including Mayors of smaller cities committed to the Covenant of Mayors. The Ministry of Economy, an utility and 6 private companies were also consulted.

### 7.3 Input from the stakeholders

The first phase dealt with energy efficiency data in buildings including link between NZEB, building planning and energy certification. Links to financial support mechanisms for refurbishment in Slovakia were investigated too.

Slovak HEC tool has been shown: Mayors appreciated it as a useful tool for the calculation of the heat losses in buildings which are in their competence.

Few days before the workshop, SIEA distributed a questionnaire regarding the accessibility of relevant data on energy performance of municipal buildings. The presentation explained why it is important to have relevant data for the fulfilment of successful renovation and also the connection to the SIEA pilot activities within the Request2Action project. The workshop tried to gather information on the reasons why information on public buildings is missing. The questionnaire, developed in collaboration with IEPD-Institute for Slovak Passive Housing, investigated barriers to deep/energy low carbon renovation, mainly availability of data and difficulties in using existing retrofit support schemes. It was delivered to 55 cities in the whole country.

More than 72% questionnaires (40 out of 55 cities) have been filled in. Stakeholders declared their interest in the results of the survey by SIEA. Some of the results are listed below:

About data **availability**:

- 80% Cities have no retrofit strategy
- 48% have no comparable and reference nZEB data
- Only 5% cities admitted the availability of data on building thermal envelop characteristics
- Only 30% cities admitted the availability of data on energy performance of HVAC systems.

- 64 % cities do not perform regular energy monitoring of public buildings and 50% have no digital collection (metering) of energy consumptions.

About barriers in using **support schemes**:

- Absence of a renovation strategy to refer to
- Lack of available and trustable data on NZEB (target performance, costs, ..)
- Lack of knowledge of performance of the building envelopes and HVAC systems
- Lack of energy monitoring and targeting implementation
- Lack of systematic collection/analysis and storage of energy consumption data
- High demanding, difficult and uncertain process of preparation of retrofit projects using EU funds

#### 7.4 Evaluation from the stakeholders

On 25 May 2016, SIEA organised a workshop on the topic “Relevant data for the refurbishment of public buildings” that attracted 26 participants. The main presentation was devoted to the outcomes of Slovak data pilot actions. The lack of systematic collection of energy consumption data at municipal level, resulting from the previous questionnaire, was dealt with. In many cases Cities start to collect this kind of information only when there is a chance to use the support mechanisms for the refurbishment. That is not systematic and often too late. The tool agreed during the input phase, that will help local authorities to collect their data was introduced and discussed. Monitoring and energy management on the local level, through which municipalities are able to get really comprehensive data for the building management, were also dealt in the workshop together with the information on support mechanisms and existing funding schemes for building refurbishment in the local and regional level in Slovakia.

#### 7.5 Impact and further development

In response to declared barriers/problems SIEA is supporting the Covenant of Mayors Municipalities as follows:

- Informing and encouraging to prepare energy renovation strategies
- Providing reference of NZEB/Passive houses public examples
- Promoting the use of EPC to get data on building envelopes and HVAC and step-by-step renovation (EuroPHit)
- Providing relevant information about energy monitoring and guidelines for consumption data collection (a template for consumption database – common xls platform in different municipalities)
- Encouraging contacts with EU funds implementation agencies and promoting free energy counselling by SIEA.

## 8. UNITED KINGDOM – providing access to EE building data for the supply chain

- 2 Input workshops in 2015-2016
- 2 evaluation workshops between February 2016 and 9th June 2017
- 9 different stakeholders engaged all along the project duration
- 9 questionnaires filled by the stakeholders
- 1 agreement (Scottish Government)

### 8.1 Co-created service-products

In the United Kingdom (specifically Scotland), the Energy Saving Trust (EST) as a manager of the EPC register for Scotland, already provides data to local authorities. EST adds value to the EPC data by cleansing it, addressing erroneous records and systematic biases in the register and by statistically modelling an EPC value for those properties that do not currently have a real EPC. EPC data are combined with 10 other datasets to create a comprehensive, reliable, up-to-date profile for 100% of properties in Scotland. Geo-spatial modelling on property type, roof orientation, building size, garden size and other variables have been used as input to feed further analysis (e.g. renewable energy resources potential). Through an arcGIS geographic information mapping and analytics software the local authorities are able to see at address, community or whole-region level the energy performance of their building stock. As part of the R2A project, EST developed a new service<sup>20</sup> to provide EPC data to the Scottish supply chain taking advantage of

<sup>20</sup> <https://localhomesportal.est.org.uk/>

similar techniques to those already used with the local authorities. The data provided enabled companies selling energy services to identify which homes in which area will benefit from different energy saving measures. This new supply chain service has now been integrated into a new Scottish home energy data hub (“the Local Homes Portal”) which provides EPC and other data to householders, supply chain actors, local authorities, community groups, researchers and national policy makers. The web maps allow comparison of the energy efficiency rating, energy consumption and carbon footprint of a particular home to the average home in the same area. The data in the maps is aggregated at the data zone level. This geographical boundary usually contains between 500 and 1,000 homes, identified by the postcode or council, and avoids privacy problems linked to eventual door-to-door selling.

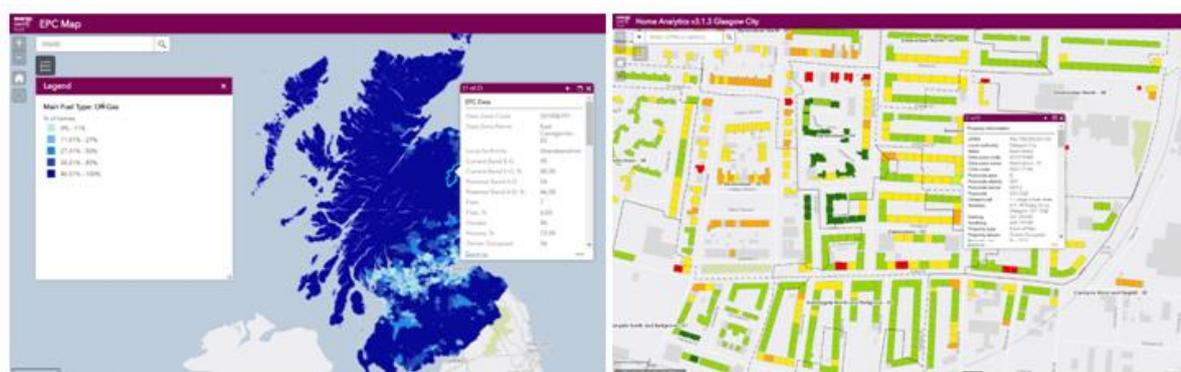


Figure 15: The EPC based data tool in Scotland targeting home owners, local authorities and trades-people

During the project workshops different stakeholders gave their views on the proposed services being developed. Supply chain views on the value of the new data services were mixed. Supply chain actors felt that the new data added little to their existing knowledge of the market for their products. At the same time the local authorities have found the maps very valuable. A key issue in Scotland has been the granularity of the data which is determined by the permission to access data for different types of stakeholder given by the Scottish Government. While local authorities are allowed by the government to access data to address (individual building) level, the Government only gave permission for EST to release data to consumers and the supply chain at local community area level (clusters of homes).

## 8.2 Stakeholders involved

Scottish companies involved with the energy efficiency and the renewables supply chain: building assessors/surveyors, consultancies, research institutions and energy companies. It was primarily sole trader and micro businesses but also some large companies and energy suppliers who commission substantial retrofit programmes.

The input workshop and webinar was only provided to supply chain users whereas the evaluation workshop was offered to all site users; however, only those classified as local authorities or policy makers and advice services attended. Generally, supply chain companies involved provide heating, home energy and plumbing services across Scotland. Advice companies, such as Home Energy Scotland and the Wise Group, that use the EPC service provide home energy saving advice through online and telephone-based communication channels.

For the list of stakeholders see Annex 1.

## 8.3 Input from the stakeholders

The input workshop and webinar aimed at understanding how supply chain actors are currently using data within their work, what information from the EPC they would find most useful and what is the best format for EPC data to be made available to them. A recent report by the Energy Saving Trust to Scottish Government had identified a need for a market data intelligence service to support development of the energy efficiency market in Scotland, which Request2Action can support.

The workshop /webinar covered:

- Summary of the Request2Action project and its aims
- Background to Energy Performance Certificates in Scotland

- Discussion/questionnaire on how organisations are currently using data
- Discussion/questionnaire on how EPC data could be used and in what format.

In the workshop information was presented to the group and specific questions were then discussed in small groups. The webinar format did not allow for discussions, instead short surveys were carried out, asking the following questions:

1. *Understanding how data is currently used by installers and others in the supply chain:*

Only a few installers stated they currently used data and overall it did not play a major role in the marketing or decision-making strategies of workshop participants.

The supply chain is dominated by small companies (1-5 people) who operate in small geographical areas. Lead generation was done primarily through word-of-mouth, referrals, periodic exhibitions and general knowledge of neighbourhoods. With the renewable heat incentive (RHI), biomass boiler installers don't have a huge need for lead generation – currently no shortage of work. Some installers use Google Maps to identify potential leads – they find houses that look to have solid/system built walls, send in a surveyor to double check then drop off leaflets.

Some participants expressed the view that it wasn't a data problem but an education issue. Home owners/tenants should be better educated on the potential benefits/savings of various energy efficiency/renewable energy technologies. If they had the knowledge, they could approach installers/assessors on their own, which would reduce the need for lead generation and mass marketing. In the webinar questionnaire the respondents used data more often than those in the workshop with 8 out of the 15 respondents saying they used data sometimes or extensively.

2. *Understanding what elements of the EPC would be most useful and how they would be used: Wall construction (e.g. solid walls, system built), Fuel type (e.g. LPG), Presence of a hot water tank), recommendations, property with an EPC, etc..*

In the workshop participants expressed an interest in the following information:

- Wall construction (e.g. solid walls, system built)
- Fuel type (ex. LPG)
- Presence of a hot water tank
  - Particularly useful if assessors/installers also knew if a property had immersion heating and if it already has a solar PV system installed (potential for free water heating)
- EPC Recommendations (e.g. install higher efficiency boiler)
- Flag indicating if a property has an EPC
- Ability to access EPCs through the Scottish registry using a postcode search
  - Similar to what Landmark offers for the registry in England and Wales
  - Searching for EPCs by postcode would save assessor time finding a property's EPC when the owner/tenant doesn't have it or doesn't know their EPC reference number

Recommended measures and survey information regarding the property came out top, reflecting the same findings as the workshop. The A-G rating also scored highly, but there was less interest in the financial information on the EPC.

3. *Understanding how that information would be used, to help EST how best to make data available.*

A large proportion, particularly of smaller installers, does not currently use data to generate leads.

The workshop attendees noted that:

- If data on relevant variables (listed above) were made available, assessors/installers would consider using it to help target potential customers
- Information within the EPC is currently used by some installers to help size the system for renewables in some cases
- Larger organisations planning retrofit schemes would find the information very helpful to plan better schemes and ensure they can be financed
- The majority of workshop participants were sole traders and had either developed their own successful lead-generation strategies or had no shortage of work and didn't have a need to target customers

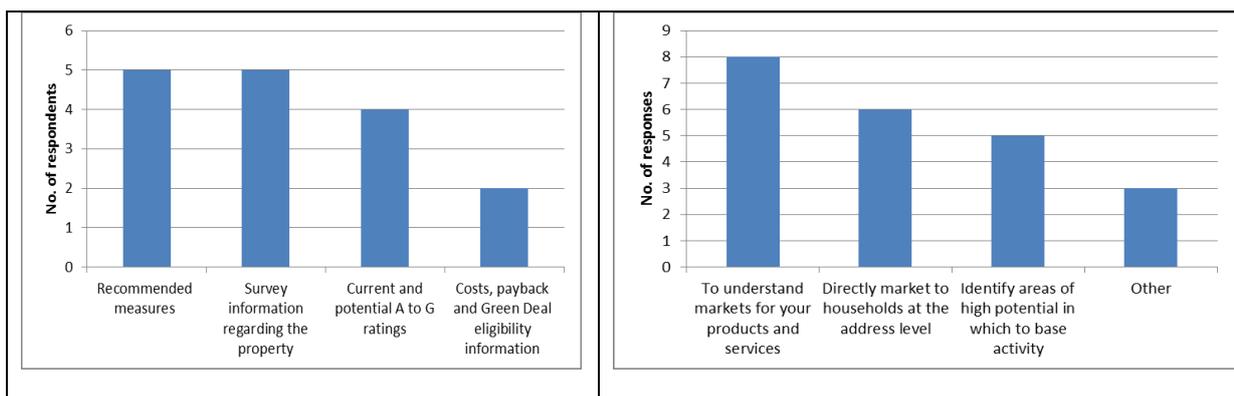


Figure 16. Left: Which elements of the EPC do you find the most useful? Right: How would you use EPC data to increase energy performance?

14 people responded to the question and over half said they would use the data to understand the market for their products and services. Those respondents who chose ‘other’ did not specify what they would use data for.

The second half of the workshop and webinar focused on demonstrating ways that data could be made available and in which format. Scottish Government has not yet stated what EPC data will be release and at what geographical level so discussions were theoretical. These options are available to view on the workshop slides/webinar along with their pros and cons, and some are below for reference.

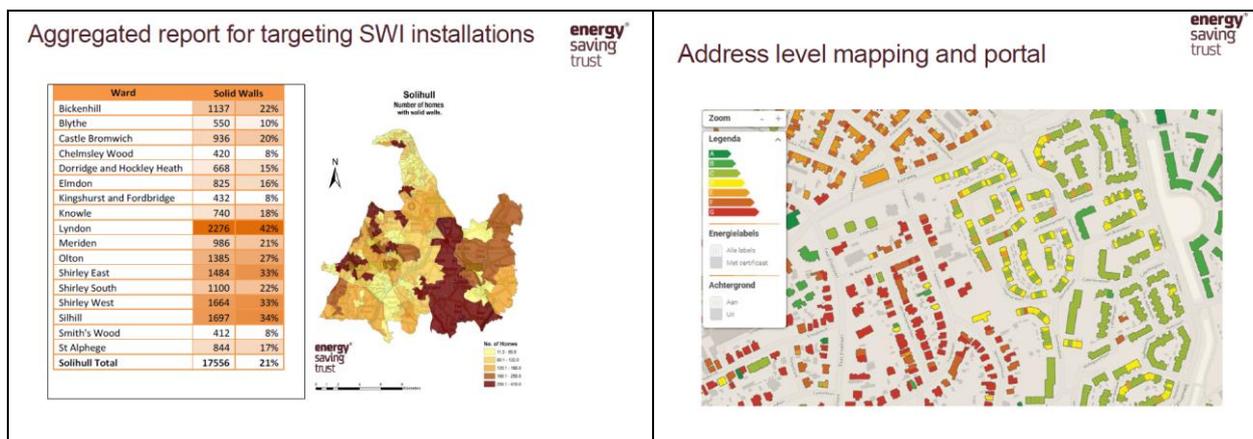


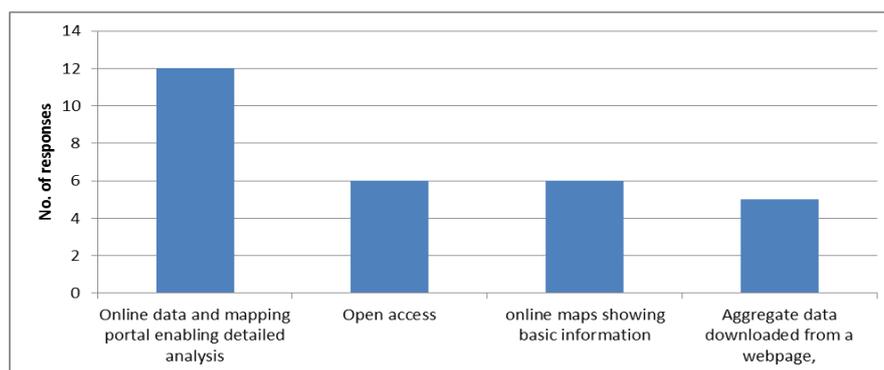
Figure 17: EST – possible representation of data on future Scottish EPC portal Suggested data formats

4 Question: What elements are important in an EPC portal and how would stakeholders like EPC data to be made available?

Data accuracy seem more valuable than ease of use

- Participants acknowledged that it would take time to develop familiarity using the portal, but that the upfront time cost would be justified if the data was accurate
- Data would need to be updated regularly (every few months)
- Actual data for a portion of the housing stock is more valuable than a combination of actual and modelled data for the entire stock
  - Again, it comes down to data accuracy
  - Participants already confident in their current approach – require high level of accuracy to consider new data-driven approach
  - Regardless of whether real or modelled data is provided, data accuracy would have to be validated through on-the-ground testing
- Address level data is ideal
  - Enables address-based targeting, but can also be aggregated if needed (best of both worlds)
  - Simply having a list of addresses and UPRNs would be gold
  - Some participants felt that the postcode level could strike a balance between usefulness and data privacy (i.e. knowing that a whole postcode is off-gas has value and doesn't require the disclosure of address-level data)

- The more information the better – then information could be applicable to as many trades as possible and they can find how best they would use it
- Cost of solution
  - Participants appreciated that data has a price, especially if it's provided through a comprehensive/interactive portal like Home Analytics
  - However, since most participants are successful sole traders, the portal would have to be a very low or zero cost solution to be of value
  - Could provide graduated price structure – users pay higher price for increased access to data/portal (maybe a free and a pay version?)
- Regulated access
  - EST or the Scottish Government identifies leads through advice centre or portal and passes these on to endorsed installers/assessors that specialise in that particular measure
  - Alternatively, regulate use of portal so wall insulation companies can only see wall insulation data and basic property attributes
  - Avoid making all data available to all companies – could be a disadvantage for smaller firms that don't have the resources to purchase user licenses, while benefiting larger firms that are more likely to engage in questionable marketing practices
- Feedback
  - It would be good to include a feedback loop to let EST know where the data is inaccurate
  - Could there be a possibility to link this to compliance? E.g. if installer reports that the EPC has been done incorrectly?



**Figure 18: EST – Answer to the question: How would you like EPC data to be made available? (No. 14 respondents)**

The general view of the more data the better seems to also be true for the webinar participants as over 85% of them responded that they would like to see an 'online data and mapping portal enabling detailed analysis'. However over 40% of them also wanted data to be open access which will be more difficult to achieve as it's more expensive the more detailed the data is.

When talking about housing data and its potential uses the issue of data security came up. In particular:

- Mass marketing approaches are already a major problem – fear that making more data available could exacerbate the problem of nuisance calls. However participants discussed that this issue was occurring already and more data may not impact on the practices used to cold call. DCLG view cold calling as a separate action that should be tackled separately.
- Worth noting that most workshop participants don't rely on cold calling/mass marketing approaches and therefore have an incentive to oppose the release of EPC data – more personal data in the hands of 'the bad guys' would further alienate potential customers, without providing 'the good guys' with much in the way of extra value

The view of some EST members was that the problem of nuisance marketing regarding energy efficiency measures exists already and is not a problem caused by data availability. The issue of nuisance marketing should be addressed by the relevant Government authorities. However its recognised that making more data available may result in further distress to those who receive calls and ways to reduce nuisance marketing (if possible) should be considered when developing the data platform.

It was also suggested that being able to download an EPC could create a situation where assessors use it as a template for a different house.

#### 8.4 Evaluation from the stakeholders

The Local Homes Portal is a tool used by householders, local authorities, supply chain users, academia and NGOs which aims to make energy efficiency data more accessible. It provides EPC and EST's Home Analytics data in order to provide energy efficiency data for domestic properties across Scottish local authorities. It mainly provides energy efficiency data in the form of EPC and Home Analytics data for domestic properties across Scotland and in the form of HEED data for domestic properties across Great Britain.

The evaluation of the Local Homes Portal consists of two elements; an online survey and a feedback workshop. The raw data for the survey is attached alongside this report.

The evaluation workshop (May 2017) was delivered through a webinar format. Originally it was planned to hold a face-to-face focus group in addition to the webinar; however, due to a low response rate the focus group was cancelled and the webinar conducted. The webinar lasted one hour and used "GoToWebinar" software which enables a recorded discussion to take place. Three participants participated on the day. Two participants represented Home Energy Scotland and the other represented a local authority.

In order to effectively evaluate the Local Homes Portal, attendees were asked to conduct 3 tasks during the webinar and then were subsequently asked questions which explored thematic areas such as content, aesthetics and navigation. The tasks were designed with the team who manage the portal itself to ensure they were appropriate to the users who participate. An outline of the tasks can be seen in Table 2.

**Table 2 - Tasks for webinar participants**

<b>Task</b>	<b>Description</b>
1. Household EPC report	Participants were asked to download a home EPC report. This task can be completed by any householder on the portal. Even though this is unlikely to be used by participants as part of their job role, obtaining feedback on this task can help evaluate this activity for householders.
2. Local Authority Home Analytics Excel report	This task consists of two stages: <ol style="list-style-type: none"> <li>1. Download the Home Analytics report</li> <li>2. Identify all properties with an F-G EPC band within a certain ward</li> </ol> This task is likely to be an activity which participants have done regularly.
3. Local Authority Home Analytics Map and User Guides	This task consists of two stages: <ol style="list-style-type: none"> <li>1. List the parameters involved in running the 'CERO cavity wall insulation (all tenures)' Home Analytics map query (this can be found in a user guide).</li> <li>2. Run this query to identify all properties within the local authority that meet these criteria</li> </ol> It is likely that participants have done this task in the past. Although, the user guides may have not been used.

#### Result of Task 1- Downloading an EPC report

This task was designed to obtain feedback from the perspective of a householder who might access the portal in order to find their personal EPC. One participant mentioned that this task was very challenging as they had not attempted this activity previously. Another agreed that they had not used the portal for this purpose before: "I hadn't used this part of the portal before, so I ended up clicking through all the continues without reading some of the information that was already there", stated a webinar participant.

One participant mentioned that this activity may be challenging to those who don't know what the Scottish EPC register is and that the explanation of this could be made clearer. However, once on the Scottish EPC register website this participant found the process "straightforward". This suggests that the Local Homes Portal's navigation and usability could be improved to ensure users can more readily find the information they require. Users' perceptions of a websites usability vary; however, it is evident that if users cannot find the required service then users often leave the site (Pearson et al 2007). Websites should be designed with simple to use navigation features, knowing that users' skill levels are likely to vary (Chen and Ryu 2013).

There was an expectation among participants that there would be a clear link to where users could download their EPC by simply entering a postcode. Two participants felt that there was a lot of text and it was identified that the link to download the EPC is the same size as the text, albeit a slightly different colour: "You have to actually be looking for [the EPC register link] to see it", said one participant.

One participant clearly expressed frustration about the number of steps involved and lack of clarity that currently exists with the text content on the Local Homes Portal, which further emphasises the need for clear navigation and signposting to tools within the portal. Website users should access the required tool within two clicks from entry to the website to ensure effective usability (Singh and Singh 2015). The participants agreed that the text amount and formatting were challenges to this task. Also all participants support the idea of a better balance between text and informative graphics in order to make the EPC download process clearer.

One respondent mentioned that the current headings could be improved by making them interactive clickable links. Users would click the heading and reveal information to make the assimilation of text easier. Well-designed navigational schemes can be used on websites to increase textual comprehension (Cuddihy and Spyrikadis 2012). The integration of a hierarchical structure as mentioned above by the participant is recommended in order to improve the usability and textual comprehension. This is of particular significance for householders who use the open access sections of the portal as their abilities in understanding textual information will vary. However, altering the navigation of the portal in this way is likely to have cost implications as a web developer would need to be hired to conduct changes.

Two participants did not review the graphics during this task citing time as a reason. One participant mentioned that the energy efficiency graphic is likely to give confidence in what the householders are looking for and what it looks like, but usefulness of other imagery was not mentioned. Instructional videos and graphics should be used to reduce complexity which may be inherent in textual explanations, thus further increasing comprehension and satisfaction (Rosen and Purinton 2004).

The link to the EPC register is embedded in the text and if users click through to avoid reading text, such as participants did, then they are likely to miss the link. This has the potential to create frustration among the users, as it did during the webinar; although, participants may have experienced time pressure due to the nature of the task which could have impacted frustration. It is recommended that the process of obtaining an EPC is made more visually appealing by reducing amount of text and reformatting to ensure the EPC register link is more prominent.

### **Results of Task 2- Home Analytics Excel Report**

This task was identified by all three participants as the main reason why they use the portal. The fuel poverty indicator was identified by a local authority participant as being particularly useful in filtering down to a more specific area rather than the whole local authority: *"The fuel poverty indicator] is quite good for us in terms of identifying the housing market areas as opposed to Argyll and Bute as a whole...It provides a lot of information that can be useful for our HEEPS ABS application as well", was the statement of a participant.*

It was felt by two participants that because this particular report is used fairly regularly the navigation is straightforward on this section of the portal. It was said by a participant: *"The Home Analytics reports are pretty straightforward... the information on it is pretty relevant particularly when dealing with local authorities, there's not much that could be done on it"*

There was clearly a high level of satisfaction amongst respondents with regard to the information that is obtained through this task and how to obtain it. This may be in part due to the familiarity of this section of the portal as frequent use and an appropriate skill set increases satisfaction (Kisby 2011).

### **Results of Task 3- Home Analytics Map and User Guide**

Two respondents highlighted that they do not usually access this element of the portal, so this task was more challenging than the previous task. This is an important consideration for future portal development as it should not be assumed that all users will be familiar with features or that their use is regular. Navigation and content should be as accessible as possible to ensure high levels of usability. In -depth information and features can be held in additional links and resources for use when required.

Failed queries were experienced by two respondents when conducting this task. There was no official indication as to why the query failed; however, the participants identified that executing the query whilst the full map is shown results in a failed query. Once the map was focused on a smaller locale then the query completed as expected. No error message or rectification support was noticed by participants. All three respondents identified that their preference is to use trial and error to find a solution rather than consult a user guide. Another respondent did consult the user guide. A participant declared *"I had look at the user guide and tried to find any words relating to fail but nothing appears to come up"*.

One respondent mentioned that he had not been into the user guides to use them, but probably would in the future. Another respondent highlighted that he had accessed the user guide when the portal was piloted, but since had relied on experience to complete any tasks he had on the Local Homes Portal.

This suggests a low level of usability from the user guides than is appropriate for this task. User guides were demonstrated during the pilot phase in this project and although the respondents had used them in the past, they are not regularly used; other user support options should be considered such as links to support appearing on the pages or an FAQ section.

When asked if more support would be useful to help find solutions when the portal doesn't work in this task one participant stated: *"I think it would be useful but I don't know enough about it to be particularly clear [about what the problem is]."*

Error messages throughout the mapping portal cannot be edited due to technical limitations in the interface used to create the mapping portal (ArcGIS online). Therefore, in order to reduce errors, it is recommended that users are directed to available support rather than relying on an automated error tracking system.

Several challenges were identified during this task. One respondent identified issues in exporting the query list once the query had run. It was highlighted that this is a useful feature and guidance should be provided for how to do this; although this is included in the user guides. Two respondents noticed that using Internet Explorer (IE) causes crashes when using the map application. A recommended web browser should be identified and suggested on the portal itself to ensure a good user experience. Directing the users to the user guides is likely to reduce the frequency of these challenges and key tips, such as using Chrome rather than IE, could be included in a welcome message.

## 8.5 Impact and further developments

Despite low attendance to the webinars/workshops, recommendations have been identified; the portal can be enhanced from a navigation perspective with more obvious links to vital features and increasing interactivity to help improve textual comprehension.

There was high recorded satisfaction with tasks which users regularly use the portal for, however non-standard tasks resulted in significant challenges such as errors and crashing. More support such as error codes or online solutions could be provided to ensure non-standard tasks can be completed effectively. A simple solution to several of the challenges identified would be to present a 'pop-up box' which appears when certain tools are opened which remind users of technical support options, user guides and to focus the map to a specific location rather than its full extent to avoid crashing.

As of 31st May 2017 the portal had had more than 500 unique users. These include both householders who accessed publicly available data and people who've created accounts for accessing restricted data.

Sign-posting to the user guides, adding tips for use on the mapping portal in the form of a pop-up and making the EPC register link more visible will be actioned by EST's Home Analytics team, who manage the Local Homes Portal.

## 9. POLAND – An “external” feedback on R2A services

- 1 workshop performed in Warsaw on 6<sup>th</sup> June 2017 getting feedback on the R2A results in other countries
- 31 stakeholders engaged to provide feedback on R2A pilot services and products

The EPC Register in Poland contains approximately 115.000 public buildings. Access to the Register is strongly restricted (not public). Only basic data from 180 EPCs is available on the Ministry's website. The household sector is not covered. The development of the EPC system is being considered by the competent Polish Ministry. The example from more experienced countries is key for further developments, so KAPE engaged different stakeholders to provide feedback to the EPC uses and services developed in other R2A partner countries.

KAPE, with cooperation of scientific circle of Faculty of Civil Engineering of Warsaw University of Technology, organised a seminar in Warsaw to present and discuss R2A results in other Countries. Main issues at the agenda<sup>21</sup>:

<sup>21</sup> Info on seminar (in Polish) and link to presentations: <http://www.kape.gov.pl/index.php/pl/projekty/aktualnosci/item/1147-jak-efektywnie-wykorzystac-swiadectwo-charakterystyki-energetycznej-budyn>

- Review of R2A products and services (KAPE)
- Detailed presentation on EPC database systems in R2A countries – features, benefits, best practices (KAPE).
- Presentation on regulations and practice on EPC and register systems in Poland (Ministry of Infrastructure and Buildings).
- Detailed presentation of WP3 results (KAPE).
- Tools supporting the EPCs performance (Warsaw University of Technology).
- EPC in practise – typical mistakes, practise versus official methodology required by relevant regulations (KAPE).
- Discussion on lesson learned.

The seminar enabled an evaluation of the Polish EPC register and system in comparison to advancements in other countries.

### 9.1 Stakeholders involved

The seminar gathered 95 participants: representatives of Ministry of Infrastructure and Buildings, Bank of Environmental Protection, buildings industry, KAPE, scientific employees of Warsaw University of Technology, students of Faculty as above and Warsaw University of Life Science. The speakers were: Arkadiusz Węglarz (KAPE) – chairman and discussion moderator; Ryszard Wnuk, Piotr Nowakowski, Michał Ościłowski (KAPE); Tomasz Gałązka and Magdalena Matula (Ministry of Infrastructure and Construction), Michał Strzeszewski (Warsaw University of Technology).

The powerful stakeholders attend the seminar, in particular representatives of Ministry of Infrastructure and Construction, which plans and regulates the EPC and database systems. The students of Faculty of Civil Engineering are just entering construction market and their increased knowledge will shape Poland EPC and databases systems as well as possible HEC and HUBs

### 9.2 Evaluation from the stakeholders

The R2A countries experiences proved usefulness of databases and possibilities of use that were considered interesting from Polish stakeholders, even if not applicable at the moment.

Experiences concerning HEC (Home Energy Check Tools) were found suitable for replication. HUB creation requires engagement of stakeholders and needs public private partnerships: that would be the next step of future activities.

At the moment the Ministry of Infrastructure is analysing the legal, technical and financial situation to include individual dwellings in the EPC system, and is very interested in experiences from other countries.



Figure 19 - Presentation of REQUEST2ACTION and the seminar audience in June 2017, Warsaw

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### 9.3 Impact and further development

Improvement and significant development of Poland EPC database is necessary and would be extremely useful for the construction sector and for raising awareness of policy makers and households. Monitoring at central and local level would be only one of the benefits among many others. Engagement of key stakeholders in HEC and HUB pilot development in Poland is recommended following best practices from other countries.

## Impact of the Stakeholder Engagement in R2A

Across all countries involved in the R2A Project, 257 different stakeholders, including associations and federations that count hundreds members, have been engaged in the R2A data-service development through a product/service co-creation process. 226 stakeholders in 8 countries (Austria, Belgium, Greece, Italy, the Netherlands, Portugal, Slovakia, United Kingdom) collaborated in providing specifications, information and evaluation. Poland, who has not created any pilot service, involved 31 Polish key actors to provide feedback on the completed R2A services.

The distribution of the type of engaged stakeholders is shown in figure 20 and compared to initial predictions (in the SE plan) in table 3.

Figure 20 – Distribution of the type of engaged stakeholders per R2A Country

Table 3. Distribution and number of stakeholders planned (red) and actually engaged (green)

Country	TOT Number		Building owners		Energy Agencies and Advice		Policy makers and Local Authorities		Representative bodies of trade/professionals		Universities, Research Organisations		Investors and developers		Trades and professionals	
	pl	a	pl	a	pl	a	pl	a	pl	a	pl	a	pl	a	pl	a
AUSTRIA Data Tool	6	28			3	6	2	9		9					1	4
BELGIUM Hub	20	24	1	1	5	5	1	3	5	4	8	8				3
GREECE Hub	25	42		3	1		1	3	6	8					17	28
ITALY Data tool, Hub	45	56	1	2	11	16	8	9	21	17	1	9	2		1	3
NETHERLANDS Data tool	5	9									1	1	4	8		
PORTUGAL Hub	19	13	1	1	7		3	2	6	9	1		1	1		
SLOVAKIA Data Tool	19	45	2		2		3	45	7		3		1		1	
U. KINGDOM Data Tool Hub	16	9	1		2	1	2	4	11							4
<b>Total</b>	<b>173</b>	<b>226</b>	<b>6</b>	<b>7</b>	<b>36</b>	<b>28</b>	<b>23</b>	<b>75</b>	<b>65</b>	<b>47</b>	<b>17</b>	<b>18</b>	<b>5</b>	<b>9</b>	<b>21</b>	<b>42</b>
Poland		31		-		7		4		10		7		2		1

Input and evaluation SE workshops counted almost **500 attendees** who almost unanimously declared themselves interested in being informed and further engaged in future actions like the R2A pilots. Around **160 evaluation questionnaires** have been filled by attendees (several times by the same persons, in some cases).

There was a **high appreciation of the way the consultation has been led**, notably facilitation, documents, presentations, insight provided by R2A partners.

80% of engaged stakeholder stated they would be available to share data/resources for the development of these pilots.

#### **Within WP2-3 pilots (AT, IT, NL, SK, UK)**

- 85% declared they can use the data/services provided by the R2A partner
- 20% are willing to share data/resources to carry on the work
- Almost 100% showed interest in working in future projects like R2A Pilot and share information
- 5 agreements were signed or verbally arranged for use of the R2A Data Tools (2 Austria, 2 Italy, 1 UK)

#### **Within WP4 pilots (BE, EL, IT, PT)**

- 77% stakeholders declared the workshop provided them with data/services they can use in their role
- 75% of stakeholders stated they can use the data/services provided by the R2A partner
- For CRES and ENEA Hubs, stakeholders were willing to contribute with information on products/techniques/events
- 80% stakeholders showed interest in carrying on collaboration in the Hubs
- 7 agreements were signed (6 Greece, 1 Belgium) or verbally arranged for the use/further development of the Hub (commitment by 14 more stakeholders: 7 Greece, 5 Italy, 2 Belgium)

## Lessons learned and recommendations

Outputs of the Stakeholder engagement have provided for an overview of usefulness, reliability, quality and self-sustainability of national R2A pilot projects (transferable tools and hubs under WP2-3 and 4) so supporting the evaluation of the whole project impact.

Moreover, the engagement of stakeholders throughout the REQUEST2ACTION project duration resulted in the following benefits for the R2A Partners:

- Information and data collected
- Increased understanding of the market
- In kind contribution (to Hubs)
- lessons learned on how to improve their services/products

**R2A Partners** learned from stakeholders how the R2A service content, layout; format could reflect user's needs. Engagement and dialogue has enabled increased understanding on market developments and identification of new strategic opportunities.

Resources have been pooled (knowledge, people, money, technology) to solve problems and reach objectives that cannot be reached by the single organisation (i.e. modelling, analysis and insight).

On the other hand **stakeholders** are now aware of present and future activities around EPC data and their use for promoting low-carbon building retrofit. Some of them (Italy, Greece, Belgium) benefit from marketing associated to their LOGO display on the Hubs. Finally, durable minutes and reports were produced and Network created in the different countries that can generate new opportunities for future collaboration on the R2A topics (Better access and use of data on EE of Buildings).

The pilots raised interest from other potential users:

- Styria and Tyrol, all Austrian provinces (as interface users) (Austria)
- More producers/trades association predicted to contribute to consultancy and contents and being part of the Hub supporting network (Italy, Greece, Portugal)
- Some more region to replicate the Lombardian experience (Italy)
- Continuing dialogue on the R2A issues (Portugal and The Netherland)
- Citizens, energy experts and solution providers engagement committed in Portugal for completing ADENE Hub

### Highlights from the stakeholder engagement:

#### Data Tools:

- Exchange of information towards integration of different databases on EE of buildings is needed mainly from policy makers at different territorial levels (municipal, regional, national) aiming at implementing and monitoring building energy performance codes/policies and energy planning.

There is a general interest in easy-to-interpret data (e.g. geo-coding, energy metric matrix, web tools). Recommended user interfaces/data format vary with targets but all agree with the role of geo-referenced maps and GIS.

Distributors, providers are interested to spot areas for potential deal.

Trades unions and larger trades or corporations would access data to expand and develop their business or targeted services, while small trades (SMEs) do not appear so interested and fear they might be affected by "unfair competition" of larger disreputable companies who have easier access to data.

Banks do not trust calculated energy performance data (from EPCs) to issue loans and are not interested in tools uniquely based on those data.

The **Hubs** are welcomed by all stakeholders. Recommendations include:

- Appeal to raise awareness on multiple benefits of low-carbon renovation for different targets
- Inclusion of cost-effectiveness of renovation measures and best practices

- Inclusion of risk issues (insurance and guarantees)
- To raise trust on the quality and skills (advisors and installers)
- Reliability and transparency of data (measures, certification schemes, labels, impact of policies)
- Targeted information/services
- Improved navigation features with more obvious links to vital features and increasing interactivity to help improve textual comprehension
- Clear rules for access and data sharing (public and restricted areas) addressing privacy concern-

A higher number of stakeholders was engaged compared to the original plan. Yet the full process was not performed by Portugal owing to the delays in subcontracting and finalising the Hub, and by the Netherlands, owing to the low interest by Banks in a service exclusively trusting EPC data.

Partners decided not to involve the predicted number of energy agencies since they found solutions for capitalising their own data and resources. The number of stakeholders was higher in those countries (Greece, Italy) that developed general and multi-topic Hubs.

Some data tools (UK, Austria, and Italy) require more specific competence from a narrower target. In this case, despite restricted attendance to the webinars/workshops and few feedbacks, relevant recommendations have been identified for enhancement and further development.

Those stakeholders who engaged as key players (as detailed in Annex 1) in the R2A pilots development are  $\frac{1}{4}$  of the total involved stakeholders (around 50): this can be easily justified by the different interest that actors may have in collaborating and using the hubs in the short term.

## Conclusions

Wider use of EPC data can help understand the housing stock, monitor EE progress and develop strategy, but it is not a common practice. REQUEST2ACTION provided large data related to current energy performance of European buildings (mostly residential ones). This action incorporated the development of databases, -containing both known records and modelled data on the whole building stock, - and of web oriented applications/ services, the R2A Retrofit Hubs, so that they are very easily accessible and can attract more users to support energy efficiency measures. This attempt was reinforced by the **contribution of relevant stakeholders** through a product-service-system (PSS) approach.

When engaging stakeholders in R2A pilot projects, partners initiated, managed, performed and evaluated two-way dialogue seeking understanding and solutions to mutual concern on optimised data on building performance and renovation. A common engagement methodology provided a benchmark for the quality and effectiveness of the data-service co-creation process in the different R2A countries.

Lessons learned from stakeholder consultations resulted in further refinement and evaluation of these services. Outputs of the Stakeholder engagement have provided for an overview of usefulness, reliability, quality and self-sustainability of national R2A pilot projects (transferable tools and hubs under WP2-3 and 4) so supporting the evaluation of the whole project impact.

Access to R2A data-service is needed mainly from policy makers at different territorial levels (municipalities, regional governments and agencies) and representative bodies of trades people. For the first ones the aim is: monitoring, building energy performance code implementation and energy planning. Data aggregated at municipal level seem to be advisable for the larger scale of provincial and regional planning. Collecting and integrating data at address level aimed at drafting SEAPs within the Covenant of Mayors initiative appears to be particularly interesting for cities.

Larger trades or corporations would access data to expand and develop their business or to provide targeted services to their members. Visualisation of data aggregated at the zone level (e.g. 500-1000 buildings or postal code, like in UK) is recommendable in this case, in order to avoid door-to-door selling and data privacy concerns. On the contrary, interest from single trades seems to be low: the supply chain, in many EU countries, is dominated by small companies (1-5 persons) who operate in small geographic areas. Their leads is based on words-of-mouth or localised advertising rather than on data analysis.

Meeting platforms matching supply and demand in a one-stop-shop, **like the R2A Retrofit Hubs**, are welcome and are a priority in the European policy for building stock renovation.

Beyond assessment of the value of new data services stakeholders engagement resulted in increased understanding of the market by Partners, further data collection, and in-kind contribution, commitment for collaboration in the development and integration of similar services.

The performed consultation had the potential – as well as to gather the data we needed for the project - to generate long-lasting networks focused on energy and low-carbon renovation of buildings and using the R2A data-services.

Finally, R2A partners believe that the Stakeholder Engagement, in developing their pilot projects, has pooled resources (knowledge, people, and technology) to solve problems and reach objectives that could not be reached by the single organisations.

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## Annex 1 - Overview of Stakeholders actually involved

	LOGO	Stkh Acronym	Stkh Full name (in English)	Stkh Category (	SIZE (e.g. n. employees, n. members)	Role
AUSTRIA	1	Energieberatung Salzburg	Energy Consulting Salzburg	Energy Agencies and Advice Organisations	40	Key player
	2	Blaue Lagune	Blaue Lagune	Trades people and professionals	36	Crowd
	3	Land Vorarlberg	Federal state Vorarlberg	Policy makers and Local Authorities	24	Key player
	4	ÖGUT	Austrian Society for environment and Technology	Energy Agencies and Advice Organisations	27	Key player
	5	klimaaktiv	klimaaktiv	Policy makers and Local Authorities	300	Key player
	6	EIV	Energy Institute Vorarlberg	Energy Agencies and Advice Organisations	80	Key player
	7	AEA	Austrian Energy Agency GmbH	Energy Agencies and Advice Organisations	70	Key player
	8	EPBD+	EPBD authorities and other interested persons	Policy makers and Local Authorities		Crowd
	9	gizmocraft	gizmocraft, design and technology GmbH.	Trades people and professionals	9	Context setter, later changed to crowd
	10	Zehentmayer	Zehentmayer Software GmbH	Trades people and professionals	10	Key player
	11	Tsukalas	Rebecca Tsukalas	Trades people and professionals	1	Key player
	12	MA39	Magistrate of the City of Vienna	Policy makers and Local Authorities	na	crowd
	13	NÖ GV	Office of the Lower Austrian Provincial Government	Policy makers and Local Authorities	12	crowd
	14	OÖ GV	Office of the Upper Austrian Provincial Government	Policy makers and Local Authorities	na	crowd
	15	BGL GV	Office of the Burgenland Provincial Government	Policy makers and Local Authorities	na	crowd
	16	TYL GV	Office of the Tyrol Provincial Government	Policy makers and Local Authorities	na	crowd
	17	ET	Energy Tyrol	Energy Agencies and Advice Organisations	24	crowd
	18	STK GV	Office of the Styria Provincial Government	Policy makers and Local Authorities	17	crowd
	19	KTN GV	energie:bewusst Office of the Carinthia Provincial Government	Energy Agencies and Advice Organisations	na	crowd
	20	ArchIng W, NÖ, Bgld	Chamber of the architects and Engineers of Vienna, Lower Austria and Burgenland	Representative bodies of tradepeople and professionals	4339	crowd
	21	ArchIng OÖ, Sbg	Chamber of the architects and Engineers of Upper Austria and Salzburg	Representative bodies of tradepeople and professionals	1489	crowd
	22	ArchIng Ktn, Stmk	Chamber of the architects and Engineers in Styria	Representative bodies of tradepeople and professionals	1524	crowd

	<b>23</b>	ArchIng T, Vbg	Chamber of the architects and Engineers in Vorarlberg	Representative bodies of tradepeople and professionals	1258	crowd
	<b>24</b>	BI Sanitär	Federal Guild of Installers for HVAC	Representative bodies of tradepeople and professionals	5605	crowd
	<b>25</b>	LI Bau Bgld	Federal Guild of constructors - Burgenland	Representative bodies of tradepeople and professionals	na	crowd
	<b>26</b>	LI Bau NÖ	Federal Guild of constructors – Lower Austria	Representative bodies of tradepeople and professionals	na	crowd
	<b>27</b>	LI Bau W	Federal Guild of constructors - Vienna	Representative bodies of tradepeople and professionals	na	crowd
	<b>28</b>	LI Bau Stmk	Federal Guild of constructors - Styria	Representative bodies of tradepeople and professionals	na	crowd
<b>BELGIUM</b>						
<b>BELGIUM</b>	<b>1</b>	VEA	Flemish Energy Agency	Energy Agencies and Advice Organisations	57	Key player
	<b>2</b>	VCB	Flemish Constructors' Federation	Representative bodies of tradepeople and professionals	9000	Context setter
	<b>3</b>	IBGE-BIM	Brussels Environmental Institute	Energy Agencies and Advice Organisations		Crowd
	<b>4</b>	WTCB	Scientific and Technical Centre for the Construction Industry	Universities, Research Organisations	240	Subject
	<b>5</b>	UA	Antwerp University	Universities, Research Organisations		Subject
	<b>6</b>	DUBOLIMBURG	Support Centre for Sustainable Building in the province of Limburg	Energy Agencies and Advice Organisations	6	Subject
	<b>7</b>	CeDuBo	Centre for Sustainable Buildings	Energy Agencies and Advice Organisations		Subject
	<b>8</b>	Bouwunie	Flemish federation of the SMEs of the construction	Representative bodies of tradepeople and professionals	8000	Subject
	<b>9</b>	Thomas More	Thomase More University College, Campus Geel	Universities, Research Organisations		Crowd
	<b>10</b>	KAHO Sint-Lieven	Catholic University College, Sint-Lieven	Universities, Research Organisations		Subject
	<b>11</b>	NAV	National Architects Association	Representative bodies of tradepeople and professionals		Subject
	<b>12</b>	OVED	Organization of Flemish Energy Assessors	Representative bodies of tradepeople and professionals		Crowd
	<b>13</b>	PHP	Passive House Platform	Universities, Research Organisations		Subject
	<b>14</b>	Kamp C	Provincial Center for Sustainable Building and Living	Energy Agencies and Advice Organisations		Subject
	<b>15</b>	UCL	Catholic University of Louvain la Neuve	Universities, Research Organisations		Crowd

16	Ugent	Ghent University	Universities, Research Organisations		Crowd	
17	KU Leuven	Catholic University of Leuven	Universities, Research Organisations		Subject	
18	VMSW	Flemish Society for Social Housing	Building owners (occupiers, landlords)		Subject	
19	Stad Gent	Milieudienst Stad Gent	Policy makers and Local Authorities		Key player	
20	Eandis	Eandis	Trades (Regional DSO)		Key player	
21	Infrax	Infrax	Trades (Regional DSO)		Key player	
22	Stad Genk	Wonendienst Stad Genk	Policy makers and Local Authorities		Context setter	
23	Stad Hasselt	Wonendienst Stad Hasselt	Policy makers and Local Authorities		Crowd	
24	Enovos	Enovos	Trades (DSO in Luxembourg)		Subject	
<b>GREECE</b>						
<b>GREECE</b>	<b>LOGO</b>	<b>Stkh Acronym</b>	<b>Stkh Full name (in English)</b>	<b>Stkh Category (</b>	<b>SIZE (e.g. n. employees, n. members)</b>	<b>Role</b>
	1	SEKA	Greek Association of Aluminium Manufacturers	Representative bodies of tradepeople and professionals		Key player
	2	EURAL SYSTEMS	EURAL SYSTEMS	Trades people and professionals		Key player
	3	GREEN WINDOWS SA	GREEN WINDOWS SA	Trades people and professionals		<b>Subjects</b>
	4	DIAMANTIS KONSTANTINOS	DIAMANTIS KONSTANTINOS	Trades people and professionals		Key player
	5	INTERSCALA	INTERSCALA	Trades people and professionals		<b>Subjects</b>
	6	PSEM	Panhellenic Association of insulation companies	Representative bodies of tradepeople and professionals	100	Key player
	7	HEPSA	Hellenic Association of Expanded Polystyrene	Representative bodies of tradepeople and professionals	29	Key player
	8	ANDREOU INSULATION ABETE	ANDREOU INSULATION ABETE	Trades people and professionals		Key player
	9	POEVY	Panhellenic Federation of Glass Tradesmen & Manufacturers	Representative bodies of tradepeople and professionals	336	Key player
	10	EBHE	Greek Solar Industry Association	Representative bodies of tradepeople and professionals	40	Key player
	11	CALPAK KIKERON HELLAS ABETE	CALPAK KIKERON HELLAS ABETE	Trades people and professionals		Subjects
	12	KETERLIS PANAGIOTIS	KETERLIS PANAGIOTIS	Representative bodies of tradepeople and professionals	1	Key player
	13	INTERSOLAR ABETE	INTERSOLAR ABETE	Trades people and professionals	4	Responsible
14	ENEPIITHE	Union of Hellenic Enterprises for Heating and Energy	Representative bodies of tradepeople and professionals		Key player	

15	MEECC	Ministry of Environment, Energy & Climate Change	Policy makers and Local Authorities		Responsible
16	D & G TRADE	D & G TRADE	Trades people and professionals		Subjects
17	NEOTEX	NEOTEX	Trades people and professionals		Subjects
18	ABOLIN CO - PERDIKIS SA	ABOLIN CO - PERDIKIS SA	Trades people and professionals		Subjects
19	VITEX – GIANNIDIS SA	VITEX – GIANNIDIS SA	Trades people and professionals		Key player
20	FIBRAN	FIBRAN	Trades people and professionals		Key player
21	JUBILAND	JUBILAND	Trades people and professionals		Subjects
22	PRISMA GLASS	PRISMA GLASS	Trades people and professionals		Subjects
23	GRUNDFOS HELLAS A.E.B.E.	GRUNDFOS HELLAS A.E.B.E.	Trades people and professionals		Key player
24	TEMPA	TEMPA	Trades people and professionals		Subjects
25	WILO HELLAS ABEE	WILO HELLAS ABEE	Trades people and professionals		Key player
26	GREENTECH	GREENTECH	Trades people and professionals		Key player
27	KOUSIOURIS	D&G TRADE	Trades people and professionals		Key player
28	POVAS	National Federation of aluminium manufacturers	Representative bodies of tradepeople and professionals		Key player
29	MARINAKIS ANDREAS	MARINAKIS ANDREAS	Trades people and professionals		Subjects
30	DIMITRIOU GEORGE	DIMITRIOU GEORGE	Trades people and professionals	1	Subjects
31	MUNICIPALITY OF VARI - VOULA - VOULIAGMENI	MUNICIPALITY OF VARI - VOULA - VOULIAGMENI	Policy makers and Local Authorities		Subject
32	MUNICIPALITY OF AG. PARASKEVI	MUNICIPALITY OF AG. PARASKEVI	Policy makers and Local Authorities		Subject
33	EMERGON	EMERGON	Trades people and professionals		Crowd
34	ZIOGAS VASILEIOS	ZIOGAS VASILEIOS	Building owners (occupiers, landlords)		Crowd
35	KAIFI GRAMMATI	KAIFI GRAMMATI	Building owners (occupiers, landlords)		Crowd
36	B2Green	B2Green	Building owners (occupiers, landlords)		Subject
37	Profil	Profilnet	Trades people and professionals		Context setter
38	SPEED SA	SPEED Development Consultants SA	Trades people and professionals		Responsible
39	enefsys	Energy Systems Engineering	Trades people and professionals		Responsible
40	InZeb	Institute of zero energy buildings	Trades people and professionals	8	Subject
41	Greek Passive House Institute	Passive house institute	Trades people and professionals	166	Responsible
42	4Green	Green House & building	Trades people and professionals		Subject
<b>ITALY</b>					

ITALY	LOGO	AIAT	Association of environmental engineers	Representative bodies of tradepeople and professionals		
	2	ACEA		Trades (Utility)	Large	Crowd
	3	ACER	Public Housing Company	Energy Agencies and Advice Organisations	>5'200 dwellings	Subject
	4	AESS Modena	Energy Agency of Modena city	Energy Agencies and Advice Organisations		Crowd
	5	AIPE	Italian Association of expanded polystyrene	Representative bodies of tradepeople and professionals		Subject
	6	IREN	IREN Multiutility	Utility		Subject
	7	ANCE	National Association of private building construction companies	Representative bodies of tradepeople and professionals		Key player
	8	ANCI	National Association of Italian Municipalities	Policy makers and Local Authorities		Context setter
	9	ANDIL	National Association of Brick Manufacturers	Representative bodies of tradepeople and professionals		Key player
	10	ANIT	National Association for the thermal and acoustic insulation	Representative bodies of tradepeople and professionals		Subject
	11	ANPE	National Association of rigid polyurethane foam	Representative bodies of tradepeople and professionals		Crowd
	12	ASSOTERMICA-ANIMA	Association of equipment and components for thermal plants Producers	Representative bodies of tradepeople and professionals		Subject
	13	ASSOVETRO	National Association of Glass Industries	Representative bodies of tradepeople and professionals		Subject
	14	CESARCH	Italian Architects Association	Representative bodies of tradepeople and professionals		Crowd
	15	CLIMABITA Foundation	Sustainable living and building foundation	Universities, Research Organisations		Crowd
	16	CNA	National Confederation of Crafts and Small and Medium Enterprises	Representative bodies of tradepeople and professionals		Subject
	17	CNAPPC	National Council of Architects	Representative bodies of tradepeople and professionals		Crowd
	18	CNI	National Council of Engineers	Representative bodies of tradepeople and professionals		Crowd
	19	CNPI	National Council of Industrial Experts	Representative bodies of tradepeople and professionals		Subject
	20	Conferenza Stato-Regioni	Joint conference State/Regions	Policy makers and Local Authorities		Responsible
	21	CONFINDUSTRIA	Association of Italiana manufacturing and service companies	Representative bodies of tradepeople and professionals		Key player
	22	DINTEC	Consortium for Energy Innovation	Energy Agencies and Advice Organisations		Crowd
	23	ENEL	National Utility Energy DSO/Electric energy/RES /Research	Trades (Utility)	Large company	Context Setter
	24	Lazio Innova	In-house Lazio Agency for innovation	Energy Agencies and Advice Organisations		Crowd

25	FEDERCASA	Italian Federation of Social Housing Organizations	Building owners (occupiers, landlords)	114 Social Housing companies are members (>850'000 dwellings)	Key player
26	FINCO	National Association of building construction companies	Representative bodies of tradepeople and professionals	>36 trades association	Key player
27	FINLOMBARDA-ILSPA	Holding company of Lombardia Region	Energy Agencies and Advice Organisations		Responsible
28	FIRE	Italian Federation for Rational use of Energy and Energy Managers Association	Energy Agencies and Advice Organisations		Subject
29	Fond. Svil. Sostenibile	Sustainable Development Foundation	Energy Agencies and Advice Organisations		Crowd
30	Federesco	Italian Federation of Italian ESCOs	Representative bodies of tradepeople and professionals		Subject
31	GBC Italia	Green Building Council Italia	Energy Agencies and Advice Organisations		Crowd
32	GSE	State-owned company which promotes and supports renewable energy sources in Italy	Energy Agencies and Advice Organisations		Subject
33	ICIE	Applied research and technology transfer in the building sector	Universities, Research Organisations		Subject
34	IRES	Istituto ricerche economiche e sociali	Energy Agencies and Advice Organisations		Crowd
35	ISPRA	National Energy for Environment	Energy Agencies and Advice Organisations		Subject
36	Ecuba srl		Energy Agencies and Advice Organisations		Crowd
37	RENAEL	Italian Network of Local Energy Agencies	Energy Agencies and Advice Organisations		Crowd
38	UNICEDIL	Association of metal carpentry/doors and windows SMEs	Representative bodies of tradepeople and professionals		Crowd
39	ZENITAL	Italian Association of natural lighting and ventilation systems industries	Representative bodies of tradepeople and professionals		Context setter
40	IRE Liguria		Energy Agencies and Advice Organisations		Key player
41	Passivhouse Italia-Zephir	Italian consultant/certification and research center for Passive Buildings	Energy Agencies and Advice Organisations		Key player
42	Regione Abruzzo	Region Abruzzo	Policy makers and Local Authorities		Responsible
43	Regione Lombardia	Region Lombardy	Policy makers and Local Authorities		Responsible
44	Regione Sardegna		Policy makers and Local Authorities		Key player
45	Regione Val d'Aosta		Policy makers and Local Authorities		Key Player
46	University Sapienza - Roma	University La Sapienza - Roma	Universities, Research Organisations		Crowd
47	University Udine		Universities, Research Organisations		Crowd
48	University L'Aquila		Universities, Research Organisations		Crowd
49	EURAC	European Research Center - Bolzano	Universities, Research Organisations		Subject

	50	Politecnico di Torino	Turin Polytechnique	Universities, Research Organisations		Subject
	51	University of Pavia	University of Pavia	Universities, Research Organisations		Crowd
	52	Coa Energia Finaosta - "Centro Osservazione e Attività sull'Energia"	Observatory on energy – Region Val d'Aosta	Energy Agencies and Advice Organisations		Crowd
	53	RSE- Ricerca Sistema Elettrico	Research of the Electric System	Universities, Research Organisations		Subject
	54	Regione Lazio	Lazio Region	Policy makers and Local Authorities		Subject
	55	MISE	Ministry of economic environment	Policy makers and Local Authorities		Responsible
	56	Agenzia del Demanio	National Cadaster – Public Buildings	Policy makers and Local Authorities		Key Player
<b>THE NETHERLANDS</b>						
<b>THE NETHERLANDS</b>	LOGO	Rabobank	Bank	Investor/developer		Key player
	2	SNS bank	Bank	Investor/developer		Key player
	3	Triodosbank	Bank	Investor/developer		Key player
	4	ABNAMRO	Bank	Investor/developer		Key player
	5	SvN bank	Bank	Investor/developer		Key player
	6	Other Bank	Bank	Investor/developer		Key player
	7	Other Bank	Bank	Investor/developer		Key player
	8	Other Bank	Bank	Investor/developer		Key player
	9	TIAS Universiteit Tilburg, Nibud	University TIAS Nibud	Universities, Research Organisations		Subject
<b>PORTUGAL</b>						
<b>POTRTUGAL</b>	1	APIRAC	Portuguese Association of Industry of Refrigeration and Air Conditioning	Representative bodies of tradepeople and professionals	40	Key player
	2	ANFAJE	National Association of Efficient Windows Manufactures	Representative bodies of tradepeople and professionals	36	Crowd
	3	AFIQ	Association of Manufactures of Boilers	Representative bodies of tradepeople and professionals	24	Key player
	4	APISOLAR	Portuguese Association of Solar Industry	Representative bodies of tradepeople and professionals	27	Key player
	5	APFAC	Portuguese Association of Mortar manufacturers and ETICS	Representative bodies of tradepeople and professionals	300	Key player
	6	APCMC	Portuguese Association of Traders of Building Materials	Representative bodies of tradepeople and professionals	80	Key player
	7	CPCI	Construction and Real State Confederation	Representative bodies of tradepeople and professionals	70	Key player
	8	AGEFE	Association of Corporate Sectors Electric Appliance, Photographic and Electronic	Representative bodies of tradepeople and professionals	150	Crowd

	9	AECOPS	Association of Construction and Public Works and Services	Representative bodies of tradepeople and professionals	9	Context setter, later changed to crowd
	10	DGEG	General Energy and Geology Direction	Policy makers and Local Authorities	80	Key player
	11	INCI	Construction and Real State Institute	Policy makers and Local Authorities	1	Key player
	12	APS	Portuguese Association of Insurance Companies	Investor/developer	71	crowd
	13	DECO	Portuguese Consumer Association	Consumer association	12	crowd
<b>SLOVAKIA</b>						
<b>SLOVAKIA</b>	1	UMOSR	The Union of Towns and Cities of Slovakia	Policy makers and Local Authorities		Key Player
	2	RRA Topoľčany	City of Topoľčany	Policy makers and Local Authorities		Key Player
	3	Trenčiansky SK	Trenčín selgovernong body	Policy makers and Local Authorities		Key Player
	4	Združenie MOS	Association of the cities and villages of the Slovak Republic	Policy makers and Local Authorities		Key Player
	5	Mestský úrad Nováky	City of Nováky	Policy makers and Local Authorities		Key Player
	6	Magistrát Bratislava	Capital City of Bratislava - Office of the Mayor	Policy makers and Local Authorities		Key Player
	7	Mestský úrad Trnava	City of Trnava	Policy makers and Local Authorities		Key Player
	8	Mestský úrad Komárno	City of Komárno	Policy makers and Local Authorities		Key Player
	9	Obec Čata	City of Čata	Policy makers and Local Authorities		Key Player
	45	Private list of other 36 Cities engaged since 2015				
<b>UNITED KINGDOM</b>						
<b>UNITED KINGDOM</b>	1	Scottish Government	Scottish Government	Policy makers and Local Authorities	3052 employees	Responsible
	2	Stroma	Stroma	Tradepeople and professionals	145 employees	Subject
	3	City Technical	City Technical Services (UK) Ltd.	Tradepeople and professionals	51-200 employees	Subject
	4	Wolesley	Wolesley UK Ltd.	Ttradepeople and professionals	4831 employees	Subject
	5	Job Worth Doing	Job Worth Doing	Tradepeople and professionals	62 employees	Subject
	6	HES	Home Energy Scotland	Consumer/ Local Authority Advice	50-200 employees	Subject
	8	The Wise Group	The Wise Group	Consumer/ Local Authority Advice	201-500 employees	Subject
	9	Argyll LA	Argyll and Bute Council	Policy makers and Local Authorities	11-50 employees	Subject
	<b>POLAND</b>					
<b>POLAND</b>	1	WIL PW	Warsaw University of Technology The Faculty of Civil Engineering	Universities, Research Organisations	Academic staff, Students	Crowd
	2	WIBHIIŚ PW	Warsaw University of Technology Faculty of Building Services, Hydro and Environmental Engineering	Universities, Research Organisations	Academic staff	Crowd

3	MIB	Ministry of Infrastructure and Construction - Department of Construction	Policy makers and Local Authorities	no data	Crowd
4	NFOŚiGW	National Fund for Environment Protection and Water Management	Investors and developers of finance programmes	no data	Crowd
5	SPIUG	Association of Heating Appliances Manufacturers and Importers	Representative bodies of trade people and professionals	17 members	Crowd
6	WISE	Warsaw Institute for Economic Studies	Universities, Research Organisations	no data	Crowd
7	PORT PC	Polish Organisation of Heat Pumps Development	Representative bodies of trade people and professionals	no data	Crowd
8	NAPE	National Energy Conservation Agency	Energy Agencies and Advice Organisations	no data	Crowd
9	GUS	Central Statistical Office of Poland	Policy makers and Local Authorities	no data	Crowd
10	RCITT Ltd.	Regional Centre for Innovation and Technology Transfer Ltd.	Universities, Research Organisations	no data	Crowd
11	PRAZE	Association of Regional Energy Management Agency in the Vistula River Valley	Energy Agencies and Advice Organisations	3	Crowd
12	ZAE	Association of Energy Auditors	Representative bodies of trade people and professionals	no data	Crowd
13	FPE	Energy Conservation Foundation	Energy Agencies and Advice Organisations	no data	Crowd
14	IGCP	Chamber of Commerce Polish Heating	Representative bodies of trade people and professionals	no data	Crowd
15	Kreisel	Kreisel	Trades people and professionals	no data	Crowd
16	ME	Ministry of Energy	Policy makers and Local Authorities	no data	Crowd
17	BOŚ	Bank for Environmental Protection	Investors and developers of finance programmes	no data	Crowd
18	Konfederacja LEWIATAN	The Polish Confederation of Private Employers LEWIATAN - Department of Energy and Climate Changes	Representative bodies of trade people and professionals	4100 members	Crowd
19	IEE	Institute of Environmental Economics	Universities, Research Organisations	no data	Crowd
20	PSWIP	Association for Thermal Insulation Systems	Representative bodies of trade people and professionals	no data	Crowd
21	PSPS	The Polish Association of Manufacturers of Polystyrene	Representative bodies of trade people and professionals	28 supporting members	Crowd
22	MIWO	Association of Wool Producers	Representative bodies of trade people and professionals	5 major manufacturers	Crowd
23	PTE	Polish Society of Energy	Representative bodies of trade people and professionals	no data	Crowd
24	NAPE	National Energy Conservation Agency	Energy Agencies and Advice Organisations	no data	Crowd
25	PIBP	The Polish Institute of Passive Houses	Universities, Research Organisations	no data	Crowd

26	Gebco	Gebco	Energy efficient houses manufacturer	no data	Crowd
27	SNB	Modern Buildings Association	Representative bodies of trade people and professionals	no data	Crowd
28	UWM	University of Warmia and Mazury in Olsztyn	Universities, Research Organisations	no data	Crowd
29	UMW	City Office of Warsaw	Policy makers and Local Authorities	no data	Crowd
30	FEWE	Polish Foundation for Energy Efficiency	Energy Agencies and Advice Organisations	no data	Crowd
31	InE	Institute for Sustainable Development	Energy Agencies and Advice Organisations	no data	Crowd

## Annex 2 - LOGOs of supporters of R2A products

### AUSTRIA: Supporters to AEA



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Π.Ο.Β.Α.Σ.

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### UK Scotland: Supporters to EST





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### **P** Project Details

**REQUEST2ACTION** IEE/13/789/SI2.675069

**Duration:** April 2014 – March 2017

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### **N** Partners

**Energy Saving Trust, EST, UK (coordinator)**

**Austrian Energy Agency, AEA, Austria**

**Centre for Renewable Energy Sources and Saving, CRES, Greece**

**Italian National Agency for New Technologies, Energy and Sustainable Economic Development ENEA, Italy**

**Flemish Institute of Technological Research, VITO, Belgium**

**Polish National Energy Conservation Agency, KAPE, Poland**

**Portuguese Energy Agency, ADENE, Portugal**

**Slovak Innovation and Energy Agency, SIEA, Slovakia**

**Netherlands Enterprise Agency, RVO, The Netherlands**



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