D6.2

Toolkits for stakeholder groups

Task 6.2 Stakeholder involvement in Sets of Solutions

SINFONIA

"Smart INitiative of cities Fully cOmmitted to iNvest In Advanced large-scaled energy solutions"

CONTRACT NUMBER	**609019**	**INSTRUMENT**	**COLLABORATIVE PROJECT**
START DATE	**01-06-2014**	**DURATION**	**60 MONTHS**

This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 609019

Publishable executive summary

The aim of task 6.2 “Stakeholder involvement in Sets of Solutions” was to involve the project partners in sharing their knowledge and experiences gathered during the runtime of SINFONIA and beyond. Therefore, lessons learned were collected from the partners on their experiences, regardless of the respective activity (project management, communication, financing, social aspects etc.). These lessons learned were compiled in an online toolkit, called Set of Solutions.

This Set of Solutions is embedded in the umbrella toolkit for stakeholder involvement summarising all activities of work package 6 (see: http://alpsthu.bplaced.net/wordpress/set-of-solutions/). It is structured in different categories and linked to the SINFONIA webpage (see: http://www.sinfonia-smartcities.eu/en/knowledge-center/set-of-lessons-learned).

About 30 lessons learned were collected from the partners. Most of the contributions are targeting designers, municipalities and housing associations. But also energy provides, R&D institutions and owners can find helpful information.

The majority of the contributions refer to topics such as knowledge and communication, design and consultancy, construction and regulatory framework. They include a variety of aspects such as guidelines for monitoring and communication, stakeholder’s involvement, tips for school refurbishment, consultancy on energy savings and more.

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INTRODUCTION

Work Package 6 “Local stakeholder involvement, evaluation & follow up in demo cities” is focussing on the social factor of smart city implementations. Since local acceptance of innovative demonstration measures is seen as a key factor for their success, which has also been proven in the first years of SINFONIA runtime, the involvement of all identified stakeholder groups (compare Deliverable 6.1a) has to be paid mayor attention. WP 6 is aiming at analysing different approaches for the involvement of single stakeholder groups and at extracting general guidelines from experiences in the demo cities Innsbruck and Bolzano in order to assist Early Adopter and other interested cities in their smart city efforts.

In this context, the aim of task 6.2 “Stakeholder involvement in Sets of Solutions” was to involve the project partners in sharing their knowledge and experiences gathered during the runtime of SINFONIA. Therefore, lessons learned were collected from the partners on their experiences, regardless of the respective activity (project management, communication, financing, social aspects etc.). In parts, the partners of the EU-funded project PassREg (IEE) worked on similar solutions for their regions, and cooperation was intended to create added value for the Smart Cities and the Passive House regions at the same time. These lessons learned were compiled in a common Set of Solutions structured in different categories and integrated in the online toolkit for stakeholder involvement for smart city projects which summarises all activities in work package 6 (see: http://alpsthu.bplaced.net/wordpress/). At the same time, the Set of Solutions is directly linked to the knowledge centre of the SINFONIA website (see: http://www.sinfonia-smartcities.eu/en/knowledge-center/set-of-lessons-learned) and other online resources such as Passipedia (see: https://passipedia.org/).

Passive House Institute (PHI) as task leader of Task 6.2 “Stakeholder involvement in Sets of Solutions” created, in cooperation with the work package leader alpS, a basic procedure including an accompanying template, workshops and interviews for the collection of best practice solutions with a focus on lessons learned, to feed the online resource.

Finally, almost 30 lessons learned were collected. Most of the contributions are targeting designers, municipalities and housing associations. But also energy provides, R&D institutions and owners can

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find helpful information in this collection. The majority of the contributions refer to topics such as knowledge and communication, design and consultancy, construction and regulatory framework.

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1. PROCEDURE OF STAKEHOLDER INVOLVEMENT IN SET OF SOLUTIONS

The involvement of numerous stakeholders in a set of solutions requires a consistent mix of personal contact, exchange and discussion and motivational work including repetitive explanations and reminders to finally receive documented lessons learned.

Therefore, Passive House Institute, the task leader of Task 6.2 “Stakeholder involvement in Sets of Solutions”, created in cooperation with the work package leader alpS, a procedure including an accompanying questionnaire, workshops and interviews for the collection of lessons learned to feed the online resource. In the following, the main workshops and processes are presented in order to give an idea of the development of the final output.

1.1 QUESTIONNAIRE

To collect the lessons learned from the partners, PHI developed a questionnaire defining the main information which might be necessary to develop a set of solutions (see the template in the annex).

Apart from the title, author, organisation, partners and location involved and the date of the documented lesson learned, it was important to assign the contribution to further categories. Thus, the partners could choose one or more categories matching with their lesson learned.
PHI defined, in dependence on the successful PassREg SOS, the following contextual themes:

- Regulatory Framework
- Business Case and Financing
- Knowledge and Communication
- Quality Assurance and Monitoring
- Design and Consultancy
- Construction

A further important assignment were the stakeholder categories. Based on the target groups identified by PHI’s communication strategy and the results from WP 6, the following stakeholders were suggested:

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- Designer
- Producer
- Politician
- Municipality
- Energy provider
- Trainer
- Financing institution
- Certifier
- R&D institution
- Tradesperson
- Housing association
- Owner
- Tenants
- Other

On a second page, the partners could fill in a short abstract as well as a short description of their lessons learned, and add images and links. In this form, the template was very helpful for a consistent documentation and collection.

1.2 WORKSHOPS

The involvement of the stakeholders in a set of solutions requires a continuous personal contact with the consortium including open exchange and interactive discussions. Especially in a complex project like SINFONIA, it is indispensable to sensibilise the partners repeatedly for the importance of such a set of solutions and to motivate them to participate in this task. Therefore, PHI organised several workshops and presentations to keep this task in mind of the consortium and to receive regular feedback on their opinions, new experience and questions. In the following, an overview of the main workshop activities and outcomes will be presented.

1.2.1 KICK-OFF MEETING IN INNSBRUCK, OCTOBER 2014

The first meeting on task 6.2 took place within the framework of the WP 6 Kick-Off Meeting in Innsbruck in October 2014. PHI explained the main objectives of this task and presented the template allowing an easy handling of the articles, for example, in terms of reviewing between the partners.

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To support the interlinkage between EU-funded projects, PHI suggested to link the SINFONIA deliverable with the existing "Solutions open Source", developed as a wikibased open platform under the auspices of the European PassREg project (see: https://passregsos.passiv.de/wiki/PassREg-Solutions_Open_Source). As a result of the discussions at the workshop it was decided that the outputs of WP 6 shall be accessible via the SINFONIA homepage.

1.2.2 18M MEETING IN INNSBRUCK, DECEMBER 2015

In order to prepare an efficient and successful data acquisition, PHI organised a workshop with SINFONIA project partners in Innsbruck in December 2015. In this workshop the present partners were asked to give inputs for potential topics (see the following table). Those shall serve as guideline to collect future lessons learned. Partners mainly suggested lessons learned in the field of communication and coordination, time management as well as tenants and politician involvement.

TOPICS FOR LESSONS LEARNED/SET OF SOLUTIONS	POTENTIAL PARTNER/AUTHOR
Communication strategy	Housing companies
City dissemination	Municipality
Presenting cost savings	Housing companies
Procedure of tenant involvement/ Tenants won´t allow access to the flat	IKB, IIG
Press claims that tenants have to pay even more money now → positive PR	IBK
Continuity of communication between stakeholders creates trust and collaboration	Research Institutes, Municipalities
More time in pre-design of refurbishments	Municipalities
Involvement of politicians, positive commitment of all parties	BOZ, IBK
Legal framework for energy solutions (ElWOG) – beginning adaption	Working groups with responsibility
Children involvement - events	tbd

TABLE 1 FIRST SUGGESTIONS FOR LESSONS LEARNED

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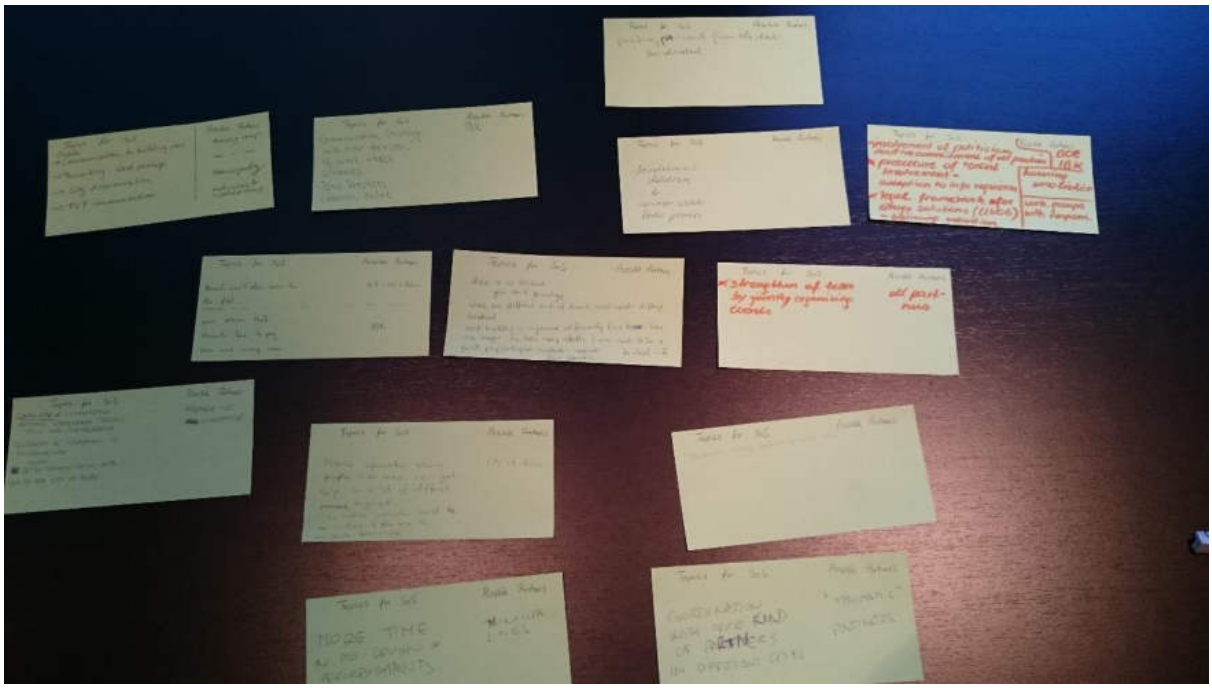

FIGURE 1 COLLECTION OF POTENTIAL TOPICS SUGGESTED BY THE PARTNERS

The partners agreed to support the data acquisition in Innsbruck through guided interviews with local SINFONIA partners, coordinated by alpS. The data acquisition in Bolzano should occur through a questionnaire and be coordinated by EURAC. PHI provided the partners with some example questionnaires.

1.2.3 24M MEETING IN SEVILLA, JUNE 2016

PHI organised a common workshop session at the 24 months meeting in Seville, in June 2016. The session was performed in order to clarify the idea of sharing experiences gathered during the SINFONIA project with others to support follower and Early Adopter Cities. The attendees discussed the concept and compilation. There was little confusion regarding task 4.1 and 6.2 among the partners. Therefore, PHI underlined the difference between the database on technical solutions developed within task 4.1 and the online resource on successful procedures, solutions, hints and lessons learned in task 6.2.

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1.2.4 30M MEETING IN BOLZANO, NOVEMBER 2016

The main objective of the workshop on 30 November 2016 in Bolzano was to clarify the cooperation with the partners from Bolzano and to discuss how to proceed with the collection of their contributions. At this stage, the partners from Innsbruck had delivered first contributions, but from Bolzano the input was still outstanding. Together with EURAC, the City of Bolzano, IPES and TIS, the workshop participants agreed on a common procedure, contact persons in Bolzano, a common deadline and on topics such as the tenant's representative as a mediator between building owners and tenants or the development of a user manual. Another topic was the collaboration between designers and researchers for the development of multifunctional façades.

1.2.5 POLICY MAKER WORKSHOP IN MUNICH, MARCH 2018 AND M49 MEETING IN LA ROCHELLE, JUNE 2018

FIGURE 2 WORKSHOP ON DEEP RETROFIT AND QUALITY ASSURANCE

The aim of task 6.2 was not only to promote the knowledge sharing of the SINFONIA consortium but also to involve external stakeholders such as policy makers and financing institutions. Therefore, PHI brought together 28 policy makers and representatives from financing programmes from all over the world to meet and discuss retrofitting solutions, with a focus on financing and quality assurance in the

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frame of the 22nd International Passive House Conference in Munich in March 2018. With speakers and attendants from a variety of backgrounds including the UNECE, GIZ, IPEEC, EASME as well as financial institutions, the session was well equipped to excite lively debate on the best incentives and implementation options for highly energy efficient buildings towards smart cities.

Presentations by representatives from the Bolzano and Innsbruck SINFONIA Demonstration Cities were complemented by speeches and a panel discussion describing the progress and achievements in the building and policy sectors in various countries and presenting the financing programme EuroPACE, an integrated building improvement platform for Europe, a project currently funded by the EU. The discussions displayed the group's optimism that retrofits can be completed to a high level if the proper incentives are in place and monitored for their effects and progress. A more detailed summary of this exchange is published at the SINFONIA webpage (see: http://www.sinfonia-smartcities.eu/en/knowledge-center/international-policy-maker-workshop-deep-retrofit-financing-and-quality-assurance).

The 49 months meeting in La Rochelle in June 2018 was the last opportunity to bring together the partners for a final brainstorming on outstanding lessons learned which should be published in the final toolkit. PHI presented the previous collection and the partners had a fruitful discussion about current topics and potential lessons learned for the toolkit.

The group identified 3 main topics which should be included in the collection. The first one concerned the financial part. The second topic referred to further experience from the housing associations, mainly how they changed their communication process with the tenants. The third part concerned the Early Adopter Cities and their experience in the project. A representative from La Rochelle, for example, stressed the important of being active from the beginning. Even when the Early Adopter Cities are waiting for results and their active role is actually foreseen at the end of the project in order to implement and adopt the strategies developed by the pilot cities, it is important to get in touch with all partners right at the beginning and to follow the whole process with high attention. The aim for the last period of task 6.2 was to collect these final experiences from the partners and to publish them online.

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1.3 INTERVIEWS

Workshops and questionnaires were helpful measures to collect lessons learned from the partners. However, filling in questionnaires by themselves seemed to be a burden for the partners, especially at the beginning. A reason could be the high number of collection processes in other tasks within the SINFONIA project in form of various databases etc. which made it difficult for the partners to still differentiate the numerous requirements. In order to facilitate and accelerate the start of the collection process, it seemed to be helpful to support them by offering personal interviews.

Therefore, alpS collected the first lessons learned from some stakeholders in Innsbruck by personal talks. Afterwards, alpS documented these lessons learned so that partners only had to proofread their contributions. In this way, alpS collected about 7 first lessons learned from Innsbruck, including topics such as the calculation of a baseline for the district energy consumption (in cooperation with the University of Innsbruck) and the installation of ventilation system in lived-in apartments (in cooperation with Neue Heimat Tirol). These interviews pushed the whole collection process immensely. Once, the partners have seen examples of filled in templates and already have edited their own first questionnaire, it was easier for them to document further lessons learned in the future.

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2. EVALUATION OF SET OF SOLUTIONS

PHI and alpS collected almost 30 contributions from the SINFONIA partners and external stakeholders. The lessons learned regard a variety of topics such as guidelines for monitoring and communication, stakeholder involvement, tips for school refurbishment, consultancy on energy savings and more. In the following, the evaluation of the stakeholder groups and topics will be presented.

2.1 STAKEHOLDER GROUPS

Based on the target groups identified by PHI's communication strategy and the results from WP 6 stakeholder identification, the following target groups were suggested:

- Designer
- Producer
- Politician
- Municipality
- Energy provider
- Trainer
- Financing Institution
- Certifier
- R&D institution
- Tradesperson
- Housing association
- Owner
- Tenants
- Other

The partners could assign one or more relevant stakeholders for their contribution. The evaluation of the contributions shows that most of the lessons learned were relevant for municipalities, designers and housing associations. Further contributions addressed R&D institutions, energy providers, owners, tenants, financing institutions, trainers and certifiers. The partners also emphasized the special role of further stakeholder groups such as media, craftsmen and the Early Adopter Cities. Producers and tradespersons were not part of the target groups, probably due to the fact that the participating partners did not represent these stakeholder groups.

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2.2 SUMMARY OF LESSONS LEARNED

The objective of this chapter is to summarise the main outcomes of the lessons learned. The complete written contributions from the partners are available in the Set of Solutions as html texts and in the annex of this report. The majority of the lessons learned belongs to the field of knowledge and communication and design and consultancy. In the following summary, some articles appear several times due to the fact that they are assigned to multiple categories.

2.2.1 KNOWLEDGE AND COMMUNICATION

The majority of the contributions refers to knowledge and communication focussing on lessons learned in the field of stakeholder involvement, tools, cooperation and further aspects:

- Calculation of a baseline for the district energy consumption
- Coordination of craftsmen and communication with tenants
- Electric Energy Efficiency for Households – Doing the whole step towards energy efficiency
- Experience Passive House - Open Passive House Days
- How we changed our communication process
- Installation of ventilation system in lived-in apartments
- Installation of a local communication team in response to a negative public perception of smart city implementations
- Involvement of Early Adopter Cities
- Nearly Zero Energy Building – Passive House and renewables
- Open Urban Sensor Data Platform as enabler for Reuse and Repurpose
- Refurbishments of SINFONIA school buildings – involvement of teachers and pupils
- Step-by-step refurbishment
- Tenants' Representative as a mediator between building owners and tenants
- User manual for tenants
- Young University Innsbruck: Day of action
- Deep retrofit financing and quality assurance – feedback from an international policy maker workshop

A very relevant topic was the **stakeholder involvement**. Partners reported on the creation of a user manual and of the importance to have a representative who acts as mediator between building owners and tenants. An important aspect is that tenants do not only need a transparent flow of information and an environment of trust, but also to experience themselves the technological innovations that

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shall be installed in their flats in advance. To give the possibility to visit a demo-apartment where tenants can see technological changes in practice, in this case how the ventilation system works, is crucial to the acceptance for the refurbishment measures (see: http://alpsthu.bplaced.net/wordpress/installation-of-a-ventilation-system-in-lived-in-apartments/). The Passive House Open Days are aimed at the same strategy. The best way to understand what an energy efficient building such as a Passive House specifically entails is to experience it first-hand. Therefore, PHI recommends to take part in the Passive House Open Days where Passive House residents open their doors to the public (see: http://alpsthu.bplaced.net/wordpress/experience-passive-house-passive-house-open-days/).

However, tenants are not the only stakeholders who need to be involved. School refurbishment, for instance, can be challenging. Partners report on time related challenges but also on their positive experience with organizing workshops to sensitize students and teachers on the matter of refurbishments and energy savings (see: http://alpsthu.bplaced.net/wordpress/refurbishments-of-sinfonia-school-buildings-involvement-of-teachers-and-pupils/). Further target groups who seem to need a special treatment are media, craftsmen and the Early Adopter Cities.

Some lessons learned are strongly linked to other work packages such as WP 4 presenting the **tools developed within the SINFONIA** project, for example the districtPH and CROCUS tools.

districtPH helps to calculate and plan the energy balance for a whole district, especially for refurbishments but also for new builds. The message of the lesson learned regarding this tool was that the best strategy to improve the energy demand of the building stock is to carry out deep refurbishments whenever the respective components require renovation. Although the reduction in energy demand may start rather slowly during the first years in this case, this approach is economically feasible and provides substantial improvements in the long run (see: http://alpsthu.bplaced.net/wordpress/renovation-strategies-assessed-via-district-energy-balance/).

Besides, DOWEL reported about their **CROCUS** tool to select a refurbishment plan. The tool is still in development and has not been in use so that they gave advice regarding the development and testing of such a tool. Thus, it is recommended to develop clear and detailed specifications early on in the development process, even if these specifications are reviewed and adjusted later on. The data

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collection process is a critical stage which requires a lot of effort and time. It represents also a unique opportunity to involve different city departments.

The regular involvement of the users (e.g. the cities) is very important to ensure that the tool meets their needs (see: http://alpsthu.bplaced.net/wordpress/crocus-tool-to-select-a-refurbishment-plan/).

2.2.2 DESIGN, CONSULTANCY AND CONSTRUCTION

The lessons learned in the range of design, consultancy and construction are connected so that they are summarised in a common chapter and include the following topics:

- Collaboration between designer and researchers for development of multifunctional façade
- Coordination of craftsmen and communication with tenants
- CROCUS tool to select a refurbishment plan
- Renovation Strategies assessed via District Energy Balance
- Guideline database for nearly zero energy neighbourhoods
- Experience Passive House - Open Passive House Days
- Electric Energy Efficiency for Households – Doing the whole step towards energy efficiency
- Thermal Bridge Catalogue
- Models for financing affordable energy solutions
- Defining the Nearly Zero Energy Building – Passive House and renewables
- Step-by-step refurbishment
- Installation of ventilation system in lived-in apartments
- Temporal challenges in refurbishing schools

This collection includes a variety of topics such as the integrated design process (IDP) which, according to the partners, is most successful when the housing company selects first the design team that in turn elaborates the final project instead of selecting a predefined renovation concept. The IDP can influence in a positive way the energy efficiency related design of the building and assist in risk reduction during the construction period. According to the partners, a high level of collaboration between energy consultants, designers, owners and technicians (meeting participation, level of knowledge of new technologies, etc.) is fundamental for the success of the final project design (see: http://alpsthu.bplaced.net/wordpress/collaboration-between-designer-and-researchers-for-development-of-multifunctional-facade/).

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Other contributions regard special topics such as thermal bridges. In retrofit projects, the final thermal performance of the building could be considerably affected by thermal bridges. Therefore, PHI recommends to analyse and optimise the connections in a building from a thermal point of view, to reduce their influence on the thermal energy balance and to assure the hygiene and comfort in the building (see: http://alpsthu.bplaced.net/wordpress/thermal-bridge-catalogue/).

To promote the interlinkage to previous EU-funded projects and to transfer already existing knowledge from these initiatives, the SINFONIA Set of Solutions also includes links to articles from the EU-funded projects **PassREG** and **EuroPHit** on the step-by-step refurbishment. The idea of the step-by-step refurbishment is to retrofit the building component by component or part by part. In the first case, the whole building is being modernised, but only one or several components at a time. For example, in a first step, insulation of the building envelope is applied, in a second step the windows and airtightness are installed, and in a last step, a ventilation system and heating and RES concepts are implemented. Buildings may also be retrofitted not as a whole, but partially. Starting with a section of the building only, then including all or at least most components, the efficiency of a certain part of the building is updated. This part can either consist of a building side or façade, a single or several flats or even whole building sections (see: http://alpsthu.bplaced.net/wordpress/step-by-step-refurbishment/ and https://passregsos.passiv.de/wiki/Step-by-step_refurbishment).

2.2.3 REGULATORY FRAMEWORK, BUSINESS CASE AND FINANCING

The **regulatory framework** was playing an important role in the SINFONIA project, especially, the data protection law in Austria which is rather strict. Contributions on **business cases and financing**, however, were limited. Neverthelesss, they contain interesting insights and ideas. Given that these topics are often linked with each other, the contributions are summarised in a common chapter. The lessons learned in the range of regulatory framework, business case and financing include the following topics:

- Deep retrofit financing and quality assurance – feedback from an international policy maker workshop
- Calculation of a baseline for the district energy consumption
- Legal framework for energy solutions in multi-family housing
- Models for financing affordable energy solutions

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- Defining the Nearly Zero Energy Building – Passive House and renewables
- Open Urban Sensor Data Platform as enabler for Reuse and Repurpose
- Economic feasibility of Passive House design

SINFONIA aims at a significant reduction of the energy demand in pioneer districts of the two demo cities Innsbruck and Bolzano. In order to evaluate the effect of demonstration measures implemented in the pioneer districts, a baseline of the district energy demand prior to the measures was required. The partners reported that obtaining the needed data was particularly challenging, since it obtains sensitive information on electricity and heating networks and data exchange is restricted by strong **data protection and data exchange laws in Austria**. To correspond to the law and institutional constraints, special procedures and data usage contracts had to be developed, considering the claims of all involved parties. Beyond that, data from different institutions and sources had to be connected. Thus, the design of a harmonized database and the harmonization of data, which is required for the baseline calculation, required a considerable amount of time (see: http://alpsthu.bplaced.net/wordpress/calculation-of-a-baseline-for-the-district-energy-consumption/).

In addition to experiences in coping with the data protection law, SINFONIA partners also presented several alternatives for the marketing of electricity from photovoltaic (PV), which has been implemented in the buildings in Innsbruck. According to the Austrian Electricity Act 2010, electricity from PV could only be directly consumed by the owner of the installation if the (local) public grid is not used to deliver the electricity from the PV installation to the consumer. Hence, the electricity provider who installed and owns the PV devices was not allowed to directly supply the electricity from the PV installations to the tenants within the renovated buildings. Thus, it was necessary to propose several alternatives for the marketing of electricity from PV of the SINFONIA buildings in Innsbruck (see: http://alpsthu.bplaced.net/wordpress/legal-framework-for-energy-solutions-in-multi-family-housing/).

In this case, the partners suggested alternatives such as feeding all generated electricity into the public grid and get a feed-in-tariff according to the Austrian Renewable Energy Law (“A” PV full feed system). Another solution consisted of using the electricity from PV for energy service purposes, for example electrical boiler, ventilation or central heating system (“B” PV for energy services). In summary this lesson learned underlined the high impact of national regulations on smart city projects.

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The partners only delivered a few contributions on **business case and financing**. However, they give ideas about different aspects such as the benchmarking of financing models and financing programmes. According to the partners, benchmarking the utilised financial models leads to the conclusion that the legal frame and regional promotion regimes are the key elements of the performed economic analysis results. These key elements serve as basic inputs for the selection of the necessary inputs to optimise the profitability of the demonstration objects and/or the benefits e.g. for tenants in residential buildings (see: http://alpsthu.bplaced.net/wordpress/models-for-financing-affordable-energy-solutions/).

The policy workshop brought together 28 policy makers from all over the world to meet and discuss retrofitting solutions, with a focus on financing and quality assurance. Hence, the EU-funded EuroPACE programme was presented, an integrated building improvement platform for Europe. It aims to make home renovation projects easier for all by offering investors secure, scalable returns and technical assistance combined with 100 % financing for up to 20 years, attached to the property and not the person – meaning it can transfer on sale (see: http://alpsthu.bplaced.net/wordpress/deep-retrofit-financing-and-quality-assurance-feedback-from-an-international-policy-maker-workshop/).

Another topic brought up in EASME's presentation at the policy workshop was that some funding can inadvertently undermine what it has set out to achieve. Consistency is key in retrofitting policy - implementing long-term financing and quality assurance strategies must continue past individual administrations and be carefully administered so as not to undo or contradict existing policy or financing measures. EASME has started the 'Smart Finance for Smart Buildings initiative,' which aims to improve the investment climate for energy efficiency by deploying financial instruments and flexible energy efficiency and renewable financing platforms, supporting the project pipeline at EU and local level, offering Project Development Assistance facilities and de-risking the Energy Efficiency Platform.

The aim of task 6.2 was also to link to the previous **EU-funded project PassREg** which already has developed an online resource containing a Set of "Solutions Open Source". Thus, PassREg content relevant for SINFONIA was linked to the toolkit, for example on the economic feasibility of Passive House design. This article shows how to design components for energy efficient renovation (EnerPHit) and new buildings so that all measures as a bundle are economically feasible as well as energetically reasonable. It includes cost calculation procedures so that architects and engineers can work with (see: http://alpsthu.bplaced.net/wordpress/economic-feasibility-of-passive-house-design/).

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2.2.4 QUALITY ASSURANCE AND MONITORING

Monitoring and quality assurance are important parts of the SINFONIA project in order to guarantee and document the final results and success in the field of energy savings. However, at the current stage of this deliverable, many monitoring undertakings could not start yet, due to organisational reasons. Hence, it would be beneficial to complement this collection at a later stage. So far, the lessons learned in the field of monitoring and quality assurance included the following topics:

- Application of quality assurance guidelines for refurbishment
- Monitoring heat consumption: Calculation and Demand
- Calculation of a baseline for the district energy consumption
- Realizing a large scale monitoring project in 300 apartments
- Deep retrofit financing and quality assurance – feedback from an international policy maker workshop

In the framework of SINFONIA more than 300 apartments were retrofitted to a very low energy standard in combination with installing renewable energies. To show the effect of these measures, a **monitoring** system had to be set up and results should be compared with demand calculations. Partners pointed out two strategic aspects which need to be considered in order to ensure a successful monitoring project: flexibility and tenant involvement. The early involvement of tenants into the retrofit process and their sensitization to the benefits is prerequisite for their consent to a following monitoring. Furthermore, to hold monitoring costs as low as possible, a flexible modular system can help to find solutions for the challenges at the construction side and helps to hold the disturbance of tenants as low as possible in order to maintain their cooperation (see: http://alpsthu.bplaced.net/wordpress/realizing-a-large-scale-monitoring-project-in-300-apartments/).

Besides, the monitoring of heat consumption requires to take into account basic conditions for the comparison of the previously calculated heating demand of a building and the subsequently measured heating energy consumption. For a reliable comparison with the actually built situation of the building (materials, thermal bridges, measured air tightness, etc.), verification using a suitable energy balance tool (e.g. PHPP) must take place. Deviations from the planning always exist. Only an accordingly adjusted (possibly complex) balance calculation is suitable for comparison.

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The actual weather conditions (outdoor temperature and global radiation) and the indoor temperature should also be entered in the adjusted balance calculation. These influences can have a great effect on the heating demand. Measurement of the heating energy consumption must take place in such a way that the actual consumption of heating energy can be determined. Other consumption parameters such as the hot water consumption, conversion losses and distribution losses must be deducted from the measured values before the comparison. Only then reliable data will be obtained which is suitable for a comparison (see: http://alpsthu.bplaced.net/wordpress/monitoring-heat-consumption-calculation-and-demand/.)

In the context of **quality assurance,** CasaClima has been testing the feasibility of the new certification protocol CasaClima R on the large-scale refurbishments of the district in Bolzano. During the design phase, a step-by-step comparison between the CasaClima R guidelines and the performances of the demo buildings showed that the guidelines required some adjustment and that in some cases the evaluation methodology had to be improved in order to be applicable to the real cases. According to their experience, the protocol for refurbishment must differ from the quality assurance method used for a new construction: it has to be more flexible in order to be applicable both in the design and in the implementation phase (see: http://alpsthu.bplaced.net/wordpress/application-of-quality-assurance-guidelines-for-refurbishment/).

3. PUBLICATION AND DISSEMINATION

The next steps subsequently to the collection of the lessons learned consist of the publication of the contributions in an online toolkit and the dissemination of these valuable experiences through various communication channels such as websites, social media, events and many more. The main measures will be presented in the following.

3.1 PUBLICATION

In order to present the outcomes of WP 6, alpS developed an online toolkit for stakeholder involvement linked to the official SINFONIA website in form of an interactive web application. Subsections are interlinked to enable a multi-dimensional access to contents resulting WP 6 outcomes.

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This way, it is ensured that different target groups can easily orientate in the toolkit and screen relevant information. The know-how derived on-site from the Demo Cities is capitalised in this toolkit for dissemination in Early Adopter Cities.

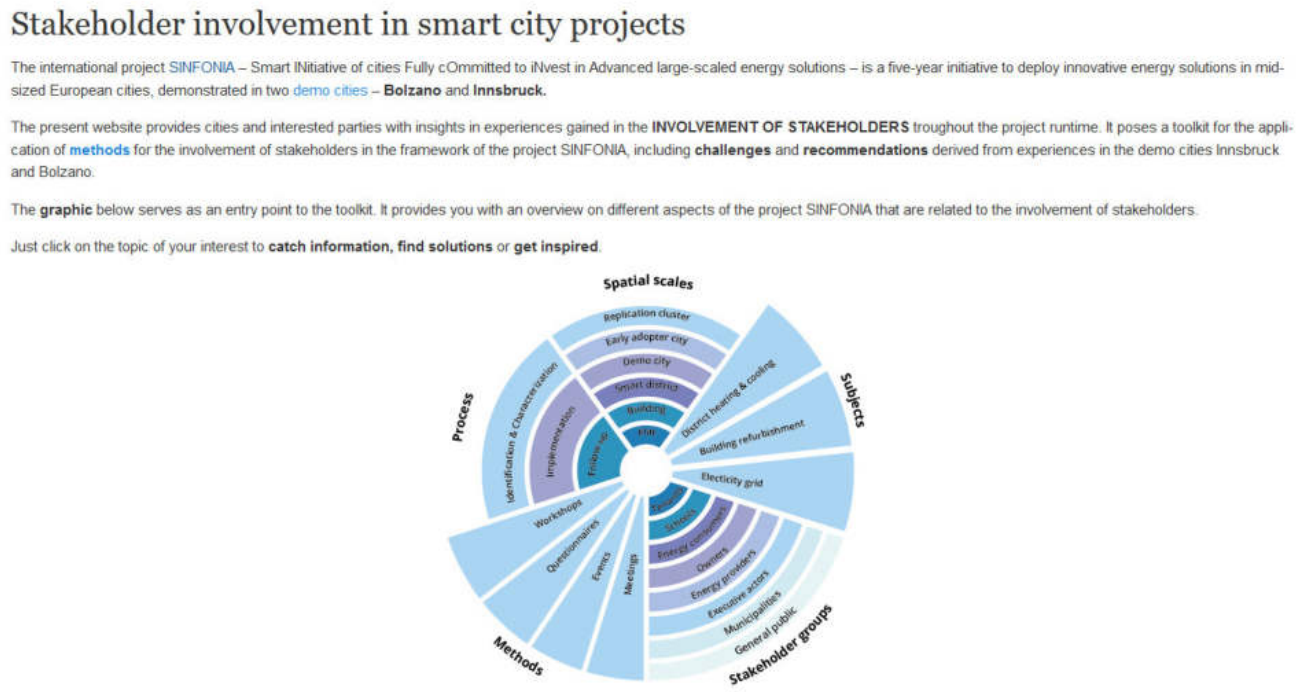

FIGURE 3 TOOLKIT FOR STAKEHOLDER INVOLVEMENT

To ensure a strong interlinkage with other outputs from WP 6, especially D 6.1, the Set of Solutions (D 6.2) is technically integrated in the database for stakeholder involvement by alpS (see: http://alpsthu.bplaced.net/wordpress/set-of-solutions/).

Thus, the Set of Solutions is accessible by two paths, either directly through the knowledge centre of the SINFONIA website (see: http://www.sinfonia-smartcities.eu/en/knowledge-center/set-of-lessons-learned) or through the toolkit for stakeholder involvement (see: http://alpsthu.bplaced.net/wordpress/set-of-solutions/).

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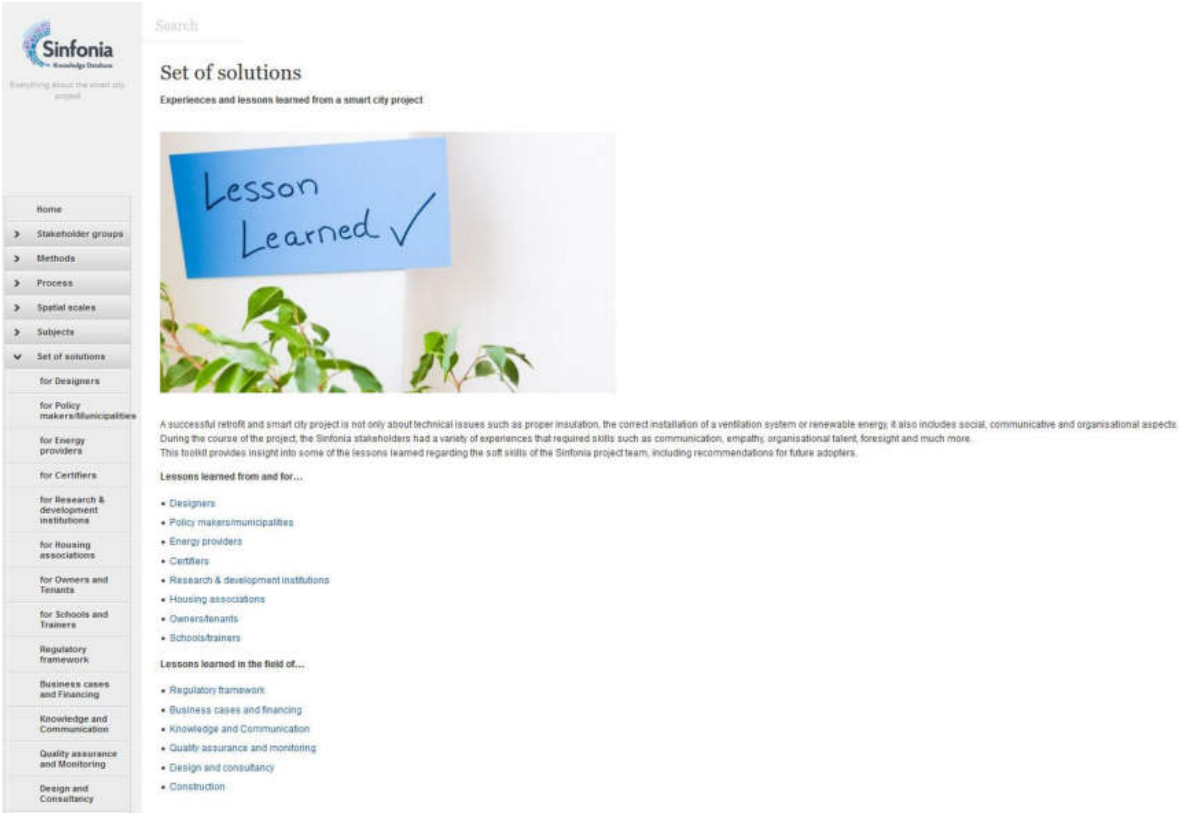

FIGURE 4 HOMEPAGE OF SET OF SOLUTIONS/TOOLKIT

On the homepage of the Set of Solutions, a short introduction explains the main idea of this toolkit. The users have access to the lessons learned by clicking either on the stakeholder groups or the thematic categories. The respective groups and categories, in turn, are linked with a subpage listing all relevant articles.

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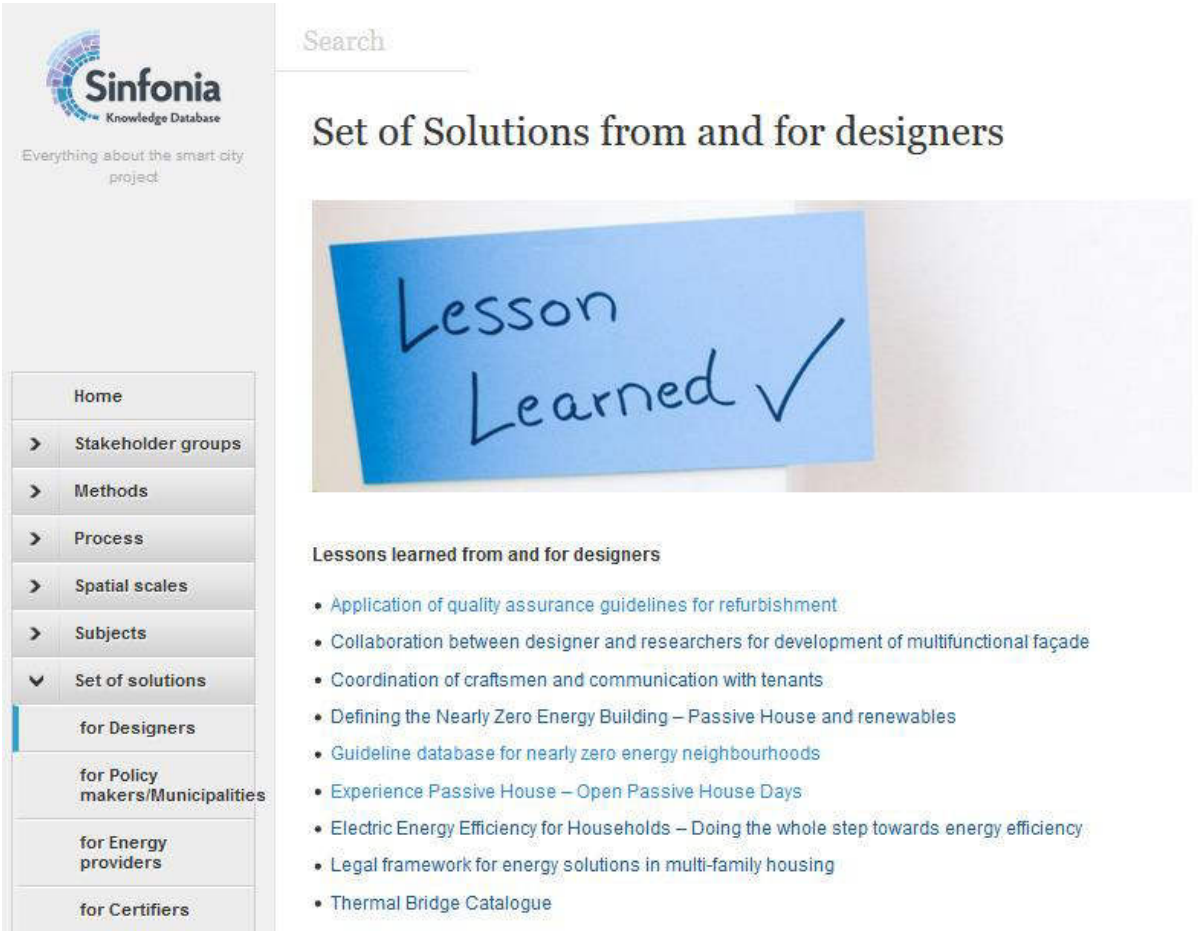

FIGURE 5 LESSONS LEARNED FOR DESIGNERS

Figure 5 shows the listing of all articles relevant for the stakeholder group “designers”. The titles are linked with the full articles. The same procedure applies for the thematic categories (figure 6). The user can click on the articles and read their content on a subpage. The presentation in html was preferred instead of adding simple PDF files so that the Set of Solutions is compatible with smartphones, too.

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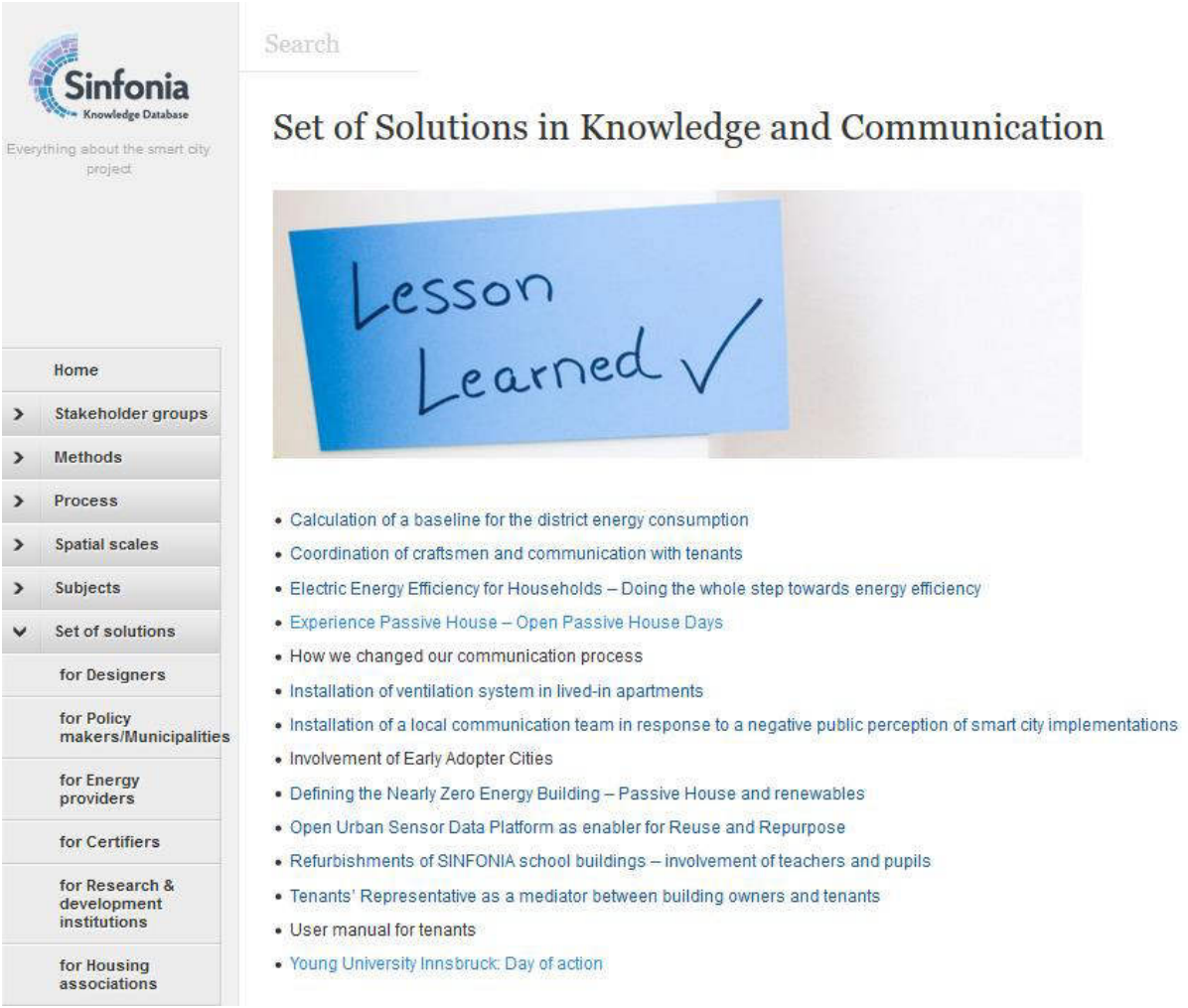

FIGURE 6 ARTICLES IN THE FIELD OF KNOWLEDGE AND COMMUNICATION

Furthermore, some of the lessons learned will also be linked to other parts of the umbrella toolkit for stakeholder involvement (D 6.1).

3.2 DISSEMINATION

The aim of the final project period is to disseminate the lessons learned available in the Set of Solutions to the widest possible audience and to reach especially the target groups indicated in this toolkit such as municipalities and designers. Thus, this part is strongly linked to WP 10.

A successful dissemination will be guaranteed by using various communication channels such as websites and social media but also workshops and other events. As mentioned, one important

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communication channel is the SINFONIA website itself where the Set of Solutions is linked to the knowledge centre. Furthermore, the Set of Solutions is embedded in the toolkit for stakeholder involvement by alpS.

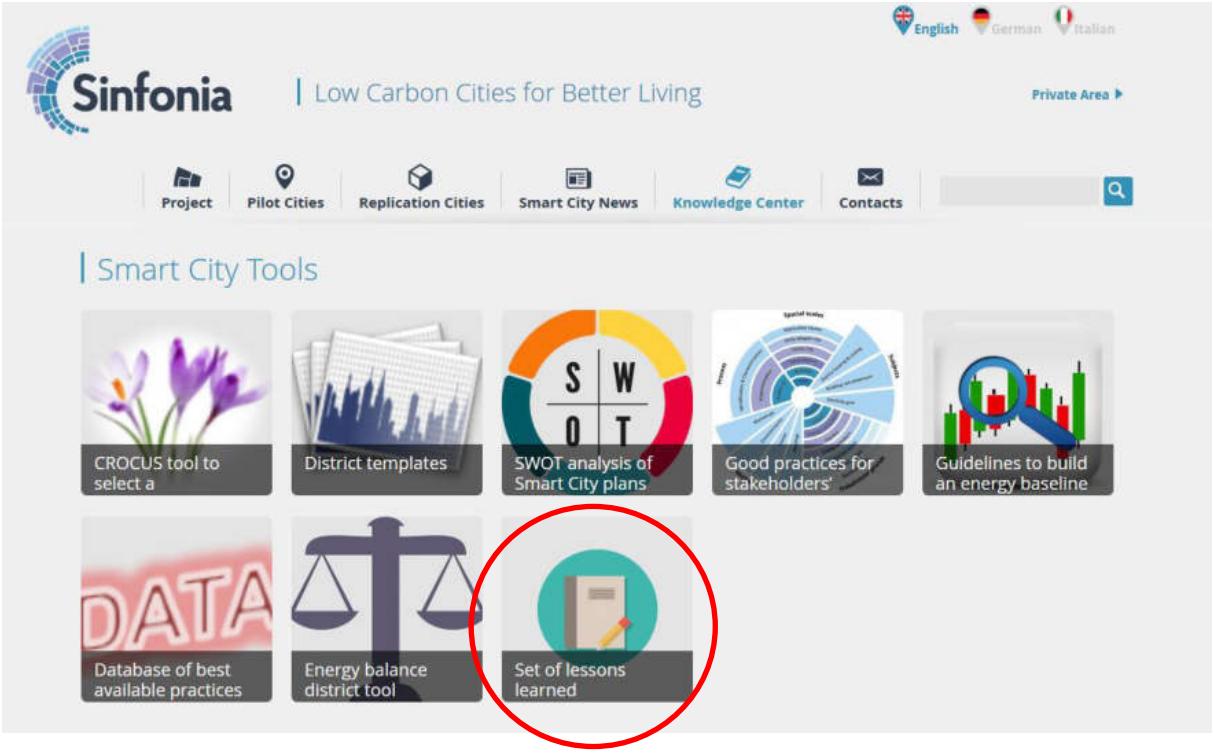

FIGURE 7 KNOWLEDGE CENTER ON SINFONIA WEBSITE

Moreover, an important objective was to connect the toolkit to existing platforms such as the Solutions Open Source made by the EU-funded project PassREg (see: https://passregsos.passiv.de/wiki/PassREg-Solutions_Open_Source) and to the online resource for Passive House buildings called Passipedia (see: https://passipedia.org/). Therefore, some of the lessons learned were also integrated in Passipedia with a direct link to the toolkit, for example the article on electric energy efficiency for households (see:https://passipedia.org/sinfonia/electric_energy_efficiency_for_households_doing_the_whole_step_towards_energy_efficiency)

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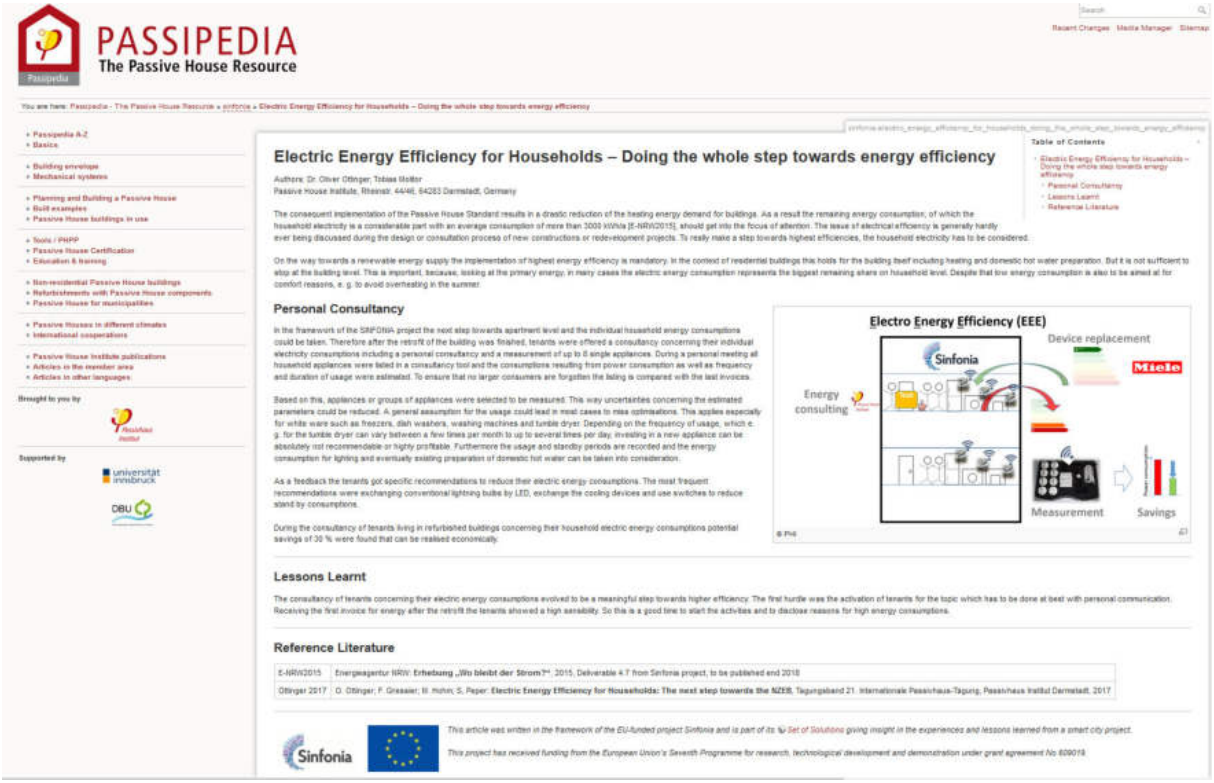

FIGURE 8 SINFONIA LESSON LEARNED ON PASSIPEDIA

Besides, the SINFONIA partners have been informed about the finalisation of the toolkit and asked to spread the word about it in their own communication and dissemination channels.

PHI will disseminate the Set of Solutions through the communication channels of its networks IG Passivhaus Deutschland and the International Passive House Association (iPHA). The International Passive House Association has a blog and a newsletter reaching more than 3000 recipients. Both networks are maintaining social media channels such as twitter and Facebook where they will post information about the toolkit.

Furthermore, events such as courses, workshops, trade fairs and conference presentations aiming at the respective target groups are important dissemination channels. The partners have to make sure to draw the attention of these target groups to this toolkit. PHI is organising a variety of events such as courses for designers, workshops for municipalities and the International Passive House Conference with about 1000 attendees every year where it will inform the audience about this offer.

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Annex: DOCUMENT INFORMATION

SINFONIA DELIVERABLE FACT SHEET	
PROJECT START DATE	1 June 2014
PROJECT DURATION	60 months
PROJECT WEBSITE	http://www.sinfonia-smartcities.eu
DOCUMENT	
DELIVERABLE NUMBER:	6.2
DELIVERABLE TITLE:	Toolkit for stakeholder groups
DUE DATE OF DELIVERABLE:	30/11/2018
ACTUAL SUBMISSION DATE:	7/12/2018
EDITORS:	Janna Breitfeld (PHI)
AUTHORS:	Janna Breitfeld (PHI)
REVIEWERS:	Kathrin Schwab (alpS)
PARTICIPATING BENEFICIARIES:	alpS, PHI, IDM, NHT; IIG; ROSE, CASA CLIMA, BOZ, EURAC, UIBK, Greenovate!, Technof, Commune de La Rochellei
WORK PACKAGE NO.:	6
WORK PACKAGE TITLE:	Local Stakeholder involvement, evaluation & follow up in Demo cities
WORK PACKAGE LEADER:	alpS
WORK PACKAGE PARTICIPANTS:	Passive House Institute, SP, RISE, magibk, Innsbrucker Kommunal, UIBK, TZS, Comune di Bolzano, EURAC, IPES, SEL SPA, CASA CLIMA, Boras Stad, COMMUNE DE LA ROCHELLE, CEMS; MUNICIPALITX OF PAFOS, Greenovate! Europe, Passive House Institute, ROSE, ALFA LAVAL CORPORATE
DISSEMINATION LEVEL:	
CO (CONFIDENTIAL, ONLY FOR MEMBERS OF THE CONSORTIUM INCLUDING THE COMMISSION SERVICES)	
PU (PUBLIC)	
PP (RESTRICTED TO OTHER PROGRAMME PARTICIPANTS, (INCLUDING THE COMMISSION SERVICES)	
RE (RESTRICTED TO A GROUP SPECIFIED BY THE CONSORTIUM INCLUDING THE COMMISSION SERVICES)	X
DRAFT/FINAL:	FINAL
NO OF PAGES (INCLUDING COVER):	28

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KEYWORDS:	Set of solutions, Knowledge sharing, energy efficiency, tenants involvement, stakeholder involvement, lessons learned, refurbishment, communication

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STAKEHOLDER INVOLVEMENT IN SETS OF SOLUTIONS

Article Template (Version 20161127)

DATE			
AUTHOR(S)			
TITLE			
CONTEXTUAL THEME	Regulatory Framework ☐ Business Case and Financing ☐	Knowledge and Communication ☐ Quality Assurance and Monitoring ☐	Design and Consultancy ☐ Construction ☐
STAKEHOLDER CATEGORY	Designer ☐ Producer ☐ Politician Municipality ☐ Energy provider ☐	Trainer ☐ Financing Institution ☐ Certifier ☐ R&D institution ☐ Tradesperson ☐	Housing association ☐ Owner ☐ Tenants ☐ Other:_____ _____
PARTNER ORGANIZATIONS INVOLVED			
LOCATION INVOLVED	Innsbruck ☐ Bolzano ☐	La Rochelle ☐ Sevilla ☐ Rosenheim ☐ Boras ☐ Pafos ☐	No specific location involved ☐ Other_____ ☐

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STAKEHOLDER INVOLVEMENT IN SETS OF SOLUTIONS

ABSTRACT			
KEY WORDS			
INTRODUCTION MAIN BODY CONCLUSION			
LESSONS LEARNT			
REFERENCES			
WEB LINKS			
IMAGES			
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Overview of the contributions delivered by the SINFONIA partners

Title	Location involved
Tenants' Representative as a mediator between building owners and tenants	Bozen
Application of quality assurance guidelines for refurbishment	Bozen
User manual for tenants	Bozen
Collaboration between designer and researchers for development of multifunctional façade	Bozen
Coordination of craftsmen and communication with tenants	Bozen
Renovation Strategies assessed via District Energy Balance	Innsbruck
Monitoring heat consumption: Calculation and Demand	Innsbruck
Guideline database for nearly zero energy neighborhoods	Innsbruck
Experience Passive House - Open Passive House Days	Innsbruck
Electric Energy Efficiency for Households – Doing the whole step towards energy efficiency	Innsbruck
Thermal Bridge Catalogue	Innsbruck
Installation of ventilation system in lived-in apartments	Innsbruck
Calculation of a baseline for the district energy consumption	Innsbruck
Young University Innsbruck: Day of action	Innsbruck
Realizing a large scale monitoring project in 300 apartments	Innsbruck
Installation of a local communication team in response to a negative public perception of smart city implementations	Innsbruck
Legal framework for energy solutions in multi family housing	Innsbruck
Temporal challenges in refurbishing schools	Innsbruck
Refurbishments of SINFONIA school buildings – involvement of teachers and pupils	Innsbruck
How we changed our communication process	Innsbruck
Models for financing affordable energy solutions	Innsbruck
Open Urban Sensor Data Platform as enabler for Reuse and Repurpose	Innsbruck

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Defining the Nearly Zero Energy Building – Passive House and renewables	Innsbruck
CROCUS tool to select a refurbishment plan	Sophia Antipolis
Involvement of Early Adopter Cities	Rosenheim
Practical tasks for Early Adopter Cities	La Rochelle
Step-by-step refurbishment	Innsbruck/Darmstadt
Economic feasibility of Passive House design	Innsbruck/Darmstadt
Deep retrofit financing and quality assurance - feedback from an international policy maker workshop	Innsbruck/Darmstadt

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