DOCUMENTATION ON DECISIONS OF 1ST "DEPLOYMENT DESK MEETING"

D.T1.1.2

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Content

1. Summary

Between June and September, the first deployment desk meetings took place in every participating country. The main target of the first deployment desk meetings was to bring together all so far envisioned relevant stakeholders, present the pilot planning to them, receive their initial feedback and agree on the next steps related to pilot deployment as well as their involvement. The deployment desk meeting was the first of four deployment desk meetings and focuses next to the integration of stakeholders whose support will be needed for the future implementation of the pilot systems on the identification of problems, needs and opportunities on EMS and energy storage planning. The participants were composed from the internal stakeholders (people/companies which are part of the project team) and the external stakeholders (representatives of different public utilities, institutions, technical experts, etc.).

The meetings were organized as an open discussion. First a short presentation of the pilot was given by the most countries to inform the stakeholders which have not been at the kick-off meeting to bring everyone on the same level. In some countries the kick-off was held on the same date as the first deployment desk meeting. Moreover, three different thematic blocks were discussed in an open discussion. Depending on the number of participants, the stakeholders have been split up in different groups, or the questions where discussed all together. The discussions have been very informative for the project team as well as for the external stakeholders. The outputs of the meetings are summarized in chapter 4 and are explained more detailed in the national reports in the appendix.

The events were very successful as the participant were beneficial and actively involved in the discussion. Moreover, the feedback of the participants was very positive in every country. The stakeholders are engaged and have confirmed to cooperate in future meetings.

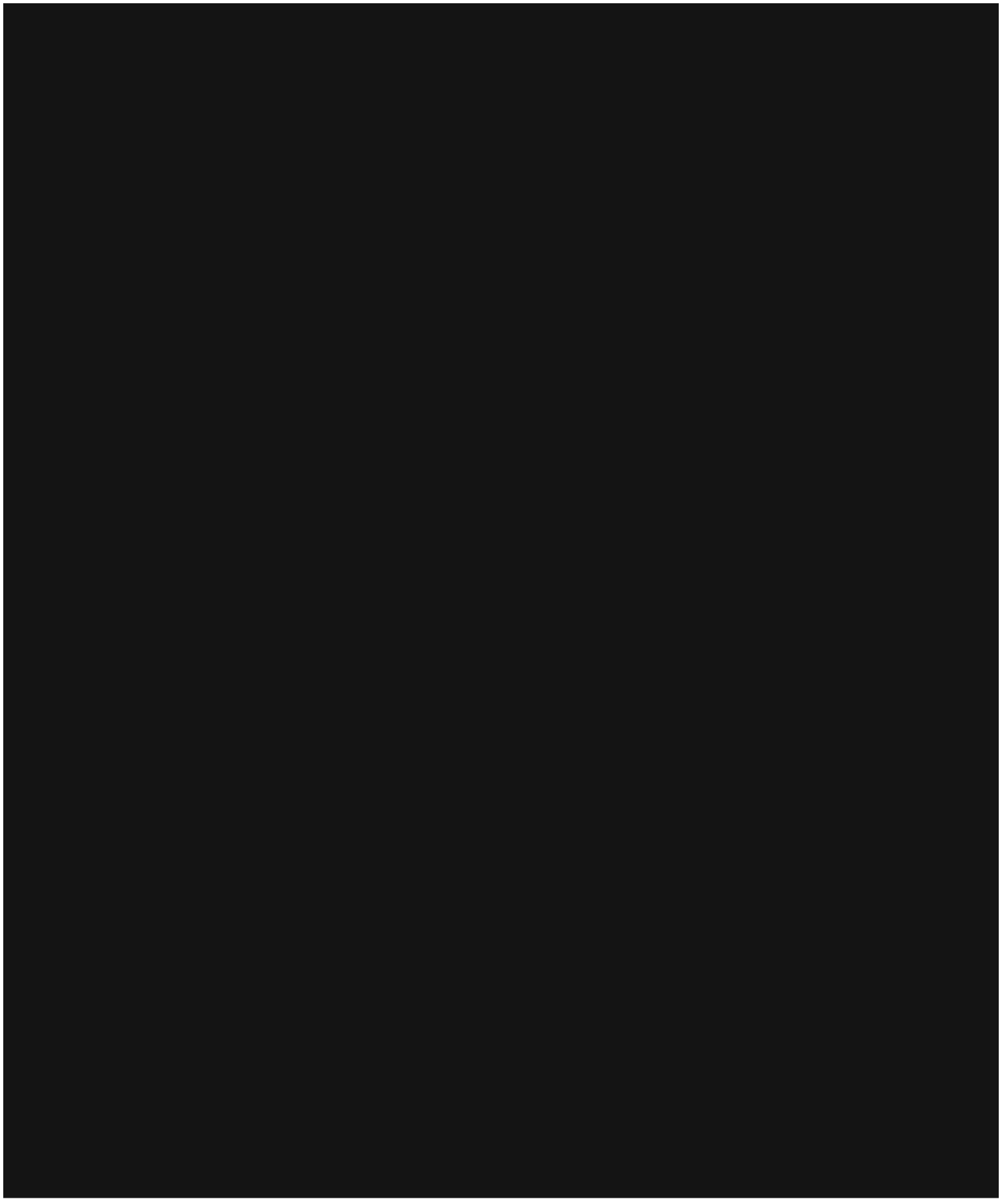
2. Date and place

- The 1st Deployment desk meeting in Slovenia was held on 23rd of September 2019 in the City hall of Municipality of Lendava.
- The 1st Deployment desk meeting in Croatia was held on 16th of September 2019 at the pilot site of the Bračak Manor (Energy Centre Bračak), Bračak 4, 49210 Zabok, Croatia.
- In Weiz more deployment desk meetings are planned than specified in the proposal. That is why already two deployment desk meetings have taken place until now. The 1st Deployment desk meeting was held on 14th of June and the second one on 11th of September 2019 both at Gasthof Ederer, Weizberg 2, 8160 Weiz, Austria
- The 1st Deployment desk meeting in Italy was held on 12th of September 2019 in Cuneo at the Casa del Fiume in Via Porta di Mondovì 11A.
- In Germany a telephone survey was carried instead of the Deployment desk meeting as there is no pilot in Germany.

3. Number and types of participants/target groups

- Slovenia:
  - [redacted]
- Croatia:
  - [redacted]
- Austria
  - [redacted]

- Italy



- [redacted]
- Germany
  - City of Heilbronn
  - Bavarian City
  - Energy Agency of the state of Northrhine-Westphalia

4. Topics tackled

4.1. Transnational summary

In every country three different thematic questions blocks have been discussed with the participants of the deployment desk. The first one consists of general questions about EMS and storages in HUCs, the second one of technical and legal questions and the third one of social and political aspects. Some questions were the same for all countries and some were national ones, related to the pilot or the specific situation in one country. Moreover, it was free for every country to adjust the suggested questions according to their needs. This makes sure that every deployment desk deals with the most important topics for his stakeholders and gives the flexibility to adjust the questions also in short-term, if a stakeholder brings some new inputs.

The basic situation is different in every country. While for example the city of Weiz already has a lot of experiences with energy related topics, the pilot in Slovenia is the first of its kind on national level. In Italy some good best practice examples are known but many of them were developed thanks to pilot project or research project. In Croatia the situation is similar. Therefore, the experience of the stakeholders is different too. A lot of our stakeholders/participants in the deployment desk have good experiences with energy technologies or energy storages in general, but for most of them, the specific connection to HUC is new. Moreover, for Slovenia the installation of the latent heat storage is also a completely new thing.

The question about problems, needs and opportunities of energy storage planning in HUC were one central part of the first deployment desk. A problem many countries have to deal with are strict conservative rules, slow administration as well as a lack of interest and cooperation with some institutions. Especial in Slovenia and Croatia, this seems to be a bigger problem. As a result, there is a lack of good best practice examples. The project Store4HUC respectively the planned pilots, will be one of them and should demonstrate all the opportunities of storages in HUC. The deployment desk meetings respectively the good integration and cooperation of the stakeholders in the meetings is one first step in this direction.

Moreover, the first deployment desk meeting was used to present the pilot to the stakeholders and bring all of them to the same level. At the end of the meetings, all stakeholders in every country, agreed on the objectives of the pilots. There are some critical issues we have to take care of, but none of them should jeopardise the execution of the pilot from the current point of view. Moreover, it become clear, that the biggest problems occur if the planned measures are visible from the outside. In none of the participation country PV systems can be installed on listed buildings (at least not without a special permit and a lot a paperwork). In Bracak Manor the PV system will therefore be installed in the surrounding. Moreover, in Weiz the design of the storage is a critical issue, as the storage will be visible from the outside. Furthermore, the KPIs were also discussed with the stakeholders and are listed in the national parts for every pilot.

In the third thematic block the main stakeholders for every pilot have been clarified and the best way for a close cooperation was discussed, as this is very crucial for the success of the project. In addition, the benefits for the citizens, the respective end-users, for the municipality and for the surrounding neighbourhood were discussed. In Lendava for example, as snowball effect and as an added value other municipalities and regions will benefit from the good practice case and experiences. In Weiz the church as well as the district heating distributor will benefit most. However, a successful implementation may result in the expansion of this small-scale district heating network with storage facility to other historic urban city districts, what brings benefits also to other citizens. Bračak Manor in Croatia is a public building open to all citizens, respective end users and it is used as a central place for organizations, companies and institutions interested in renewable energy as well as for small and medium companies from other sectors. In Italy too every citizen will benefit from the energy efficient slop elevator either by using it as

connection to the city or because of the reduced traffic in the city centre. Furthermore, the pilot case will serve as a show-character for EE/RES measures on the transnational and regional level.

In Germany three surveys were carried out, which can be summarized as follows:

- Getting a permission for installing PV or energy storage in historical buildings can be difficult. In some German states practically impossible. It depends on the rules set by the persons in the monument protection authorities.
- Because of financial restrictions in the municipalities its more likely to install a storage system related to the churches.
- In the days of writing this report in the city of Würzburg organizes an event dealing with using solar energy in the old part of the city. As they are member in Climate Alliance, PP10 could plan a common event with Store4HUC and would like to have a storage seminar with them.
- It seems that the topic of climate protection and sustainable energy supply in the building sector has been more well received by the churches than in the municipal sector. As the "preservation of creation" is one of the basic missions of the churches, the achievement of a CO2-neutral building stock is a task to which many dioceses and regional churches (Landeskirchen) are intensively dedicated. The installation of energy storage systems could be a natural part of the projects to reach this goal. If this knowledge is combined with the quota of listed buildings in the church area, the relevance of the Store4HUC project for the churches becomes clear.

4.2. Regional summary

4.2.1. Slovenia:

Outcome of general questions about EMS and storages in HUCs

On regional as well as on national level Slovenia does not have any real good examples on EMS and energy storage planning and investments in HUC´s. So, the energy managers have not many experiences in this sector and also often no clear guidelines. On national level, it is common that cooperation is assessed as purely official and often inefficient. Moreover, there is almost no connection between different segments / development areas on regional level.

That means, that there is a need of real good examples on EMS and energy storage planning in HUC´s on regional (and also on national) level. The latent storage pilot will hopefully be a good example for further development in this sector and will hopefully encourage also other cities/energy managers/spatial planners to implement such kind of energy solutions in their HUC´s. Thermal energy storage technologies and geothermal district heating systems have the potential to play a significant role in the transition towards 100 % renewable energy systems through increasing system flexibility and overall efficiency and thus reduce CO_2 emissions and increase domestic energy security, additional reduce the costs of heating.

Furthermore, the stakeholders agree that on the long term a new long-term Strategic Sustainable Energy Plan with incorporated Regional Action plan for the energy efficiency and exploitation of renewable energy sources (HUC´s included as a special areas) as a basis for future documents has to be developed.

Outcome of the questions regarding to pilot specific technical/legal framework conditions

In general, the idea of the pilot is interesting for the stakeholders. The participants are satisfied that the investment will not cause any harmful impact on the environment. They find the idea of heating the premises of the library good in order the temperature of the rooms don’t drop too much at night.

The pilot is an innovative investment at national level, such installation has not yet been built anywhere in the Slovenia and in this case the pre-investment report will give a clear technical overview/specification. The reason is that the geothermal energy could be exploited only in the north-

eastern part of the Slovenia (especially in Pomurje region) as the potential is a lot better in this part of the country. The idea of the latent thermal storage is quite new also. Therefore, the stakeholder does not have any experiences with this kind of storages yet. The reason why the decision was made on this kind of storage, instead of a thermal hot water storage, is because it requires less space, which is very important especially in case of Lendava library.

The pilot is in accordance and in line with the measures and goals of most important strategic action plans of Lendava municipality. The objectives of the pilot in Lendava (e.g. 60 MWh reduction of energy consumption of fossil fuels, reduction of 16,8 tons of CO_2, 5,5 % or 3 MWh increase of energy efficiency, etc.) were presented to the stakeholders. All stakeholders have agreed on these objectives. Moreover, potential KPIs of the pilot has been worked out together:

- supply temperature (between DHS and heat exchanger)
- supply temperature (between heat exchanger and storage)
- return temperature (between storage and heat exchanger)
- several calorimeter's
- thermal power
- flow

Outcome of the questions regarding to pilot specific social/political aspects

The main actor of the pilot is a provider of the geothermal energy and the owner of the geothermal network/district heating system in Lendava city. They are Petrol Geo. The Lendava library and the Institute for the Protection of Cultural Heritage of Slovenia are also important actors as well as the Municipality of Lendava, the financer and the end-user of the storage. The municipality implements the measures and goes in line with the guidelines of their Local Energy Concept, which represents their concept of developing a self-governing local community in energy supply and use, which in addition to energy supply plans includes measures for energy efficiency, cogeneration of heat and electricity and the use of renewable energy sources. As a snowball effect and as an added value other municipalities and regions will benefit from the good practice case and experiences. The pilot case will serve as a show-character for EE/RES measures on the transnational and regional level. The Municipality of Lendava is quite interesting in the replication effect of the pilot, to apply the pilot in other public buildings (e.g. schools, kindergartens).

4.2.2. Croatia:

Outcome of general questions about EMS and storages in HUCs

In Croatia there are very few examples of good practice, but as an example is recognized Spiritual Education Center Mary's Palace near Zaprešić, and Bračak Manor which is the pilot building on Store4HUC project. Nevertheless, the participating stakeholders already have experience in implementing photovoltaic systems with battery storages, and also with the possibilities of integrating different assets into a central monitoring system but not in implementing such systems in HUC. The main problems of implementing EMS and energy storage planning in HUC in North-west Croatia are strict conservation rules, and slow administration as well as a lack of interest due to increased investment.

Outcome of the questions regarding to pilot specific technical/legal framework conditions

All stakeholders agreed on the objectives of the pilot in Bračak. Furthermore, the usage of IT and energy management to best exploit the assets installed was found very needed for HUCs in order to keep the physical interventions as minimal as possible for the targeted performance at the end. They like the way PP8 and PP9 plan to monitor and predict energy consumption and production in the Bračak Manor through

the central building management and control system, as well as to manage heat production assets, heat storage and battery storage to gain optimum performance in accordance with our KPIs:

- direct savings on electricity bills
- increasing the use of RES
- reducing CO_2 emissions
- increasing energy independence

So far, no critical issues regarding to the cultural heritage protection have been identified. It is clear that the photovoltaic system cannot be attached directly to the building and its positioning in the manor surrounding was discussed where a car pot was agreed as a good position for it.

Outcome of the questions regarding to pilot specific social/political aspects

The main actors are representatives of the Krapina-Zagorje County, Conservation Office in Krapina, Croatian electricity distribution system operator (HEP-ODS), Ministry of Construction and Physical Planning, Zagorje Development Agency (ZARA) and Croatian Association of Historic Towns (HUPG). Stakeholders recognized the Bračak Manor as an excellent example of how-to energy refurbish a cultural heritage building in accordance to best energy efficiency practices and use of renewable energy sources, and they agree that the practice should be replicated to other HUC buildings. In that respect, Ministry of Construction and Physical Planning wanted to be closely informed about the further developments both on the Croatian pilot and also on the other Store4HUc pilots since they are in a process of drafting technical regulations for energy renovation of protected sites and clear performance figures and practical examples are very important to them now.

Bračak Manor is a public building open to all citizens, respective end users and it is used as a central place for organizations, companies and institutions interested in renewable energy as well as for small and medium companies from other sectors. The main objective of the energy centre located in Bračak Manor is continuing education, exchange of experience and information to all stakeholders on the sustainable use of energy, so this will continue in the future.

4.2.3. Austria

Outcome of general questions about EMS and storages in HUCs

There are already some good best practice examples and projects in the city of Weiz as for example the plus energy building “W.E.I.Z. 4, the MULTI-transfer project and the Hot Ice Weiz project (integration of a latent heat storage). Therefore, many of the participating stakeholders already have a lot of experiences regarding renewable energy and storage technologies but the focus on historical urban centres is a relatively new thing for most of them too.

In Austria structural changes according to the respective zoning plan, as for example in Weiz, requires a building licence including a positive local landscape protection evaluation. Therefore, the following requirements and needs have to be fulfilled locally and also nationally due to the approval situation:

- mostly implementation below terrain and surface level,
- utilization of existing buildings to cover the extension and associated restrictions regarding the dimensions of the new building,
- specially adapted design of the visible facades with regard to colour and geometry while complying with the requirements for weather resistance,
- minimally invasive integration, in order not to influence existing natural conditions such as trees and bushes.

Outcome of the questions regarding to pilot specific technical/legal framework conditions

The pilot plant biomass heating plant Weizberg already offers a CO_2 neutral and 100 % renewable heat supply with wood as energy source. However, the plant is currently inefficient due to a lack of thermal energy storages. More wood is burned than necessary and the locally limited land consumption and life cycle footprint is considerably higher than necessary. The integration of a thermal energy storage into the existing heating plant can counteract this and contribute to a more efficient use of resources and land. The integration of a latent heat storage has also been discussed, but a thermal hot water storage is the preferred option because of cost issues.

All of the biomass members are satisfied with this solution. As there had already been discussions with most of the stakeholders before the official kick-off meeting, it was already largely possible to agree on the present approach. There are no problems regarding to the cultural heritage protection expected, as long as the points mentioned above (general questions) are fulfilled. Moreover, following KPIs have been identified/confirmed:

- Profitability
- Reduction in energy delivered per capita
- Average yearly emission abatement
- Autarky rate in days
- Stimulation of the local economy

Outcome of the questions regarding to pilot specific social/political aspects

The main stakeholders in Weiz are the members of the biomass network Weizberg, the representatives of the city of Weiz as well as the energy and innovation centre W.E.I.Z (PP3). Furthermore, the church is an important stakeholder too. They are not part of the deployment desk but nevertheless a close dialog with them is planned. The church (the whole parish) is very interested in energy efficiency and in saving energy, as well are the interested in reduce the backflow temperature, so the solutions with enlarge the energy efficiency with several measures and to implement a heat exchanger, was a good solution for the parish and they are willing to support and finance the project. However, there are not directly any special social aspects to consider for the reason that the pilot is a church.

Citizens play a minor role in the project implementation. Connected to the district heating system and the new water storage system is mainly the parish buildings, the church, the elementary school and a restaurant with hotel. However, a successful implementation may result in the expansion of this small-scale district heating network with storage facility to other historic urban city districts.

Due to the meetings, which take place about once every six months, the interest groups should follow the course of the project and be constantly updated. The meetings will include a summary of problems and their causes. By sharing the gained knowledge in a meeting, discussions about the implementation process can be raised, which contributes to an informed solution-finding.

4.2.4. Italy:

Outcome of the Energy Storage in Historic Centres: What opportunities

In Italy some good experience or best practice are known but many of them were developed thanks to pilot project or research project. One reason therefore might be that only in Veneto and Lombardi the private owners have the opportunity to require incentives for the installation of energy storage connected with installation of RES. Nevertheless, the participants of the deployment desk agree, that in the specific case of HUC the energy storage could be a big opportunity for storage energy produced out to HUC. Many constraints concerning the protection of architectural and environmental heritage that prevent the installation of RES and energy storage in historic centres could be overcome by the installation of energy

storage. The RES could be produced out of HUC and directly used in the HUC thanks to the energy storage. At the regional level there aren't specific need on technological aspect. Technologies and expertise are on the market. Moreover, the implementation of energy communities is considered like a big opportunity in order to improve the use of energy storages.

Outcome of the Energy Storage in Historic Centres: What constraints?

There are no barriers and regulatory constrain concerning protection of architectural and environmental heritage that prevent the installation of Energy Storage in HUC but new regulation and law at national level must be developed on the field of energy trading. The lack of regulation on energy marked based on energy decentralization and peer to peer energy trading prevents the spread of energy storages. In Italy it is quite easy to get the permit for PV installations in HUC if the building isn't protected by regulatory constraints. If it is protected, no PV plant can be installed. Innovative integrate photovoltaic system could help to overcome these constraints but must be evaluated case by case and depending by the overall architectural design. Regarding to the pilot itself, a regulatory barrier concerning the protection of natural heritage join with the lack of regulation on energy marked based on energy decentralization and peer to peer energy trading could limits the installation of PV plant foreseen by the project.

Outcome of Storage systems and energy/environmental planning towards the 2030 targets

The main stakeholder involved on energy and environmental planning towards the 2030 targets are the different sector of Public Authority at different level (municipality, province, region). The principal opportunities of municipality regarding the integration of economic, social, energy and environmental aspects into its policies are the SEAP and SECAP, but these documents are effective only if integrated with the other planning and regulatory tools of the Municipality. In order to obtain social and economic benefits, greater interactions between the various sectors of the municipal administration are hoped for.

The stakeholders agree that the potential replicability of the pilot is very high. Cuneo Pilot project could even be replicated on the same municipality thanks to the new sustainable urban mobility plan that foreseen the implementation of new elevators that will connect the HUC with intermodal parking. Also, in the Province of Cuneo other municipality have similar public mobility system where is possible implement the same technology and solutions.

4.2.5. Germany:

In Germany a survey was carried out instead of the physical deployment desk meeting. As there is no pilot in Germany, the questions are a bit different to the other meetings. A summary of the outcome is shown below. The detailed questions and answers are part of the national document in the appendix.

Problems:

- Building measures for climate protection at cultural monuments often are in conflict with the legal regulations for the protection of historical monuments.
- Energy storage systems are likely to be of particular interest for individual and ensemble supply systems and local heating solutions.
- Often the requirements as a basis for the planning of the storage facilities are not known. Especially if the energy supplier is not the owner of the buildings to be supplied.
- A big difficulty is planning security because an investor will only know the actual requirements very roughly. Therefor a modular, expandable concept is recommended.
- In HUC there are problems with the structural integration of the storage facilities into the existing system.

Needs:

- The investor is free in the planning and technical conception, but the listed building must remain intact.

Opportunities:

- Often not all buildings are listed in a HUC. This means there is more room for manoeuvre for the interior of the buildings. Changes to the external appearance of "non-cultural monuments" in historical areas are often subject to approval (e.g. through design statutes).

Local differences:

- In Germany the protection of historical monuments is in the sovereignty of the federal states, i.e. each federal state has its own law for the protection of historical monuments.

  Basically, the laws regarding (electrical) energy storage are the same, but the law hands over the final responsibility for grid stability to the respective distribution system operator. Therefore, a large electrical storage system with high power output may be allowed in one region but not allowed in another region, due to grid issues.

- Heat storage systems are usually not connected to any grid; therefore, registration and approval is not necessary.

- For planning and implementation there are the standards of the professional associations (DIN, VDI, DVGW etc.) which are regarded as recognized state of the art and which should be observed.

Experiences of the participant:

- One of the participants providing feedback has worked for 10 years in the lower protection monument authority of a German state. An energy manager runs battery storage systems in not protected buildings and PV-systems in a protected HUC area.
-
- The consultant of the energy agency has a wide range of experience with municipal projects and energy storage.

Permits for installations:

- Always it is a case-by-case decision of the responsible authorities, because each cultural monument is individual. Basically, the storage elements which are housed in the adjoining rooms in the basement of a cultural monument and have no appreciable effect on the appearance and the historical substance, can rather be regarded as being compatible with the monument. The energy manager of the Bavarian city says that the challenge is to get a permission for the energy generation unit (i.e. PV panels or solar thermal modules) which are visible from outside.

Best practice examples:

- The representative of the city of Heilbronn knows no best practice examples, the energy manager from the Bavarian city only very few. The NRW energy agency representative seems to know several examples. One of these is in the framework of the Energy Laboratory Ruhr.

Kind of storage:

- The main technology in the heating sector are hot water storage tanks. Solar thermal modules are always black. Therefore, it would not be possible to get a permission for red roofs of listed buildings. Since PV panels are available in different colours, it is easier to have them installed on listed buildings. But it is economically not feasible.

Latent heat storages:

- City of Heilbronn is not aware of any paraffin storage facilities that have been realized. In the Bavarian city they have district heating in their historic city centre, therefore no need for heat storage.
- In NRW the most common variant of latent heat storage is ice storage. The technology is currently establishing itself on the market. The representative knows of a regional church that focuses on wood pellets + ice storage in its CO2 reduction program.

Permit for PV systems:

- The question must be considered in a very differentiated way. The permit depends on how the cultural monument is classified. In Baden-Württemberg in case it is a cultural monument of special importance it enjoys special protection. In that case the buildings are also protected with regard to their effect in their surroundings including non-listed buildings. Each decision is an individual decision of the authority. In the Bavarian city everything depends on the people working in the institutions. If the set-up rules of the person in charge are obeyed a permission is possible.

- The NRW energy agency confirms that it is very difficult to obtain approval for PV systems.

- The officials in the monument protection authority have always the right to decide. If the whole area is protected no PV system can be approved - even for new buildings. Although there are similarly designed PV modules for historic roof tiles, in all cases known to him the approval was refused. In NRW, there are no PV systems known to the energy agency on listed buildings.

PV roof tiles:

- The high costs of special red PV-panels make these systems economically inefficient and private investors as well as e.g. the local perishes refrain from installing these systems. Energy Agency of the state of Northrhine-Westphalia states that in theory PV roof tiles would be a solution but practically it’s not possible to obtain a permit.

5. Implemented actions and links to deliverables, outputs

In four of the five countries (SI, HR, IT, AT) the deployment desk was carried out as a physical meeting of the local/national stakeholders. All stakeholders were involved in the deployment desk initially through direct contacts (phone calls, emails, etc.) and sometimes through official invitations if necessary. The meetings were held in a moderated way. In most countries first the presentations (introduction of the pilot, etc.) were carried out and then the questions were asked by the moderator. In Slovenia, Croatia and Austria, the questions have been divided into three topics:

- General questions about EMS and storages in HUCs
- Pilot specific technical/legal framework conditions
- Pilot specific social/political aspects

In Italy slightly different topics have been chosen:

- The Energy Storage in Historic Centres: What opportunities?
- Second Topic: The Energy Storage in Historic Centres: What constraints?
- Third topic: Storage systems and energy/environmental planning towards the 2030 targets

In some countries, the first deployment desk meeting was connected with the kick-off meeting. In Austria more deployment desk meetings are planed than in the other countries. Approximately one every half year. Therefore, the first and the second Austrian meeting are combined in this report.

In Germany a telephone survey was carried instead of the Deployment desk meeting as there is no pilot in Germany. The main action consisted of contacting different city representatives by phone, explaining the targets of the Store4HUC project and sending additional information by email. In order to obtain a written feedback, usually several phone calls are necessary. The contact persons got chosen from cities with a long history, where it is supposed that they have monument protected buildings within its areas. They got chosen looking on the background with a possible professional knowledge in monument protection. Some representatives got approached during participation in events or invited to personal meetings.

Depending on the date of the deployment desk, in some countries already some promotion material has been used, the other countries will use it from the second deployment desk meeting on.

This deliverable relates also to D.T1.1.1 deliverable which outlines the deployment desks concept on Store4HUC as well as to D.C 6.7 the kick-off event and D.C.1.1 the communication strategy.

6. Results, effects and the response

The most important achievement of the first Deployment desk meetings is that we have brought together in one place all the relevant institutions and organizations needed to properly discuss open questions and potential obstacles that we could potentially encounter during implementation of the pilots. By establishing the stakeholder deployment desk, we will make sure, that the stakeholders are involved in the whole project. With this instrument, we will reach the relevant players to share the knowledge and transfer it to other additional audience.

In Slovenia the participants were positive in terms of the new idea and the pilot storage presentation. The discussion followed by the presentation was long and intensive, all participants provided the feedback and their opinion. The comments provided are useful for the further work and brought added value. The participants were curious if the storage also consumes additional energy for operation. The replication of the idea was also discussed and how much should (additional) storages differ compared to the pilot storage (are there modification required and possible). It was pointed out that the optimisation of the storages is necessary. E.g. the pilot storage should be filled in the peak when the water is the hottest. The old boiler heated by fossil fuel will remain in case the temperate outside in the winter will be low (around -20 degrees). Just in case the location for the storage should be again checked, but after careful spot check the storage will be located in the library itself and not in the building close to the library. The paraffin-based storage was selected due to small volume that occupies in the boiler room. Moreover, the director of the library highlighted a few issues regarding the structure of the building and the heat distribution system, that should be considered when planning. Although the director hesitates, he supports the storage installation and is looking forward for reduction of the costs.

In Austria, there are 44 cities with historical city centres. In addition, 26 monuments are under protection in Weiz and 38 367 in Austria. Considering these figures, there is broad agreement among the stakeholders to continue along the chosen path. However, the main critical points are the integration into the landscape and the resulting additional costs, which are necessary due to the additional planning. Since the pilot plant is not supported by investment subsidies from Store4HUC, external subsidies for the planned plant are an important goal of the stakeholders and will be investigated further. The stakeholders were particularly surprised by the fact that the innovative approach not only makes implementation possible, but also that it is possible to save almost 20 % of CO2 emissions due to optimised boiler operation. It is also essential for the stakeholders and the implementation that the boilers can be used for a longer period of time due to optimised operation and thus costs can be saved.

In Croatia, all relevant stakeholders were invited, to inform them about the planned pilot action and to receive feedback from them. The meeting was attended by representatives of the Krapina-Zagorje County, Zagorje development agency, Ministry of Culture of the Republic Croatia – Conservation office in Krapina, Ministry of Construction and Physical Planning, Croatian Association of Historic Towns, University of Zagreb Faculty of Electrical Engineering and Computing, and North-West Croatia Regional Energy Agency. After the initial presentation of the project performed within the kick-off event leaned to the deployment desk meeting, the stakeholders were introduced to the pilot project Bračak and were explained what is planned through the project. After that, a discussion was opened to identify technical, economic and conservation barriers related to the implementation of energy efficiency measures and renewable energy sources and energy storages in historical urban centres in Croatia. The discussion was of an open character where stakeholders presented separately their views while focusing on their area of expertise.

In Italy, based on the topics discussed, many ideas and suggestions emerged both for the development of the pilot and more generally on the opportunities for development and dissemination of energy storage in urban areas. The deployment desk has given the opportunity to create a better connection between the different sectors of Municipality of Cuneo in the definition of the energy and environment policy. Many

results of the discussion will be useful for the develop of the SECAP that will be finalized at the beginning of the next year. During the first deployment desk the stakeholder had also discussed on the opportunities to create energy communities on Piedmont Region and about the improvement of the smartness level in the municipality of Cuneo. Important and significant relations between energy storage and the development of municipal policies for the creation of energy communities and smart cities have also emerged.

In Germany, we received written feedback from 2 municipalities and one energy agency. Two other municipalities did respond in a positive way showing interest in following the project. They didn't want to provide written feedback because they are just started being active in the Store4HUC field and don't feel save writing about this topic.

7. Conclusion

The event was successful as the participant were beneficial and actively involved in the discussion. The feedback of the participants was very positive in every country. In Croatia for example all stakeholders have been fully satisfied with the generally meeting and 98 % with the content of it. The other countries have not used feedback forms but asked for a short feedback at the end of the meeting. In general, the stakeholders liked the innovative topic which is attractive, and they did also like the exchange of opinions. The stakeholders are engaged and will cooperate in the future meetings. Following targets have been the main motivation for the stakeholders to participate in the meetings:

- Learning something new and gain the knowledge.
- Knowledge sharing.
- Improvement of collaboration and communication between different sectors/stakeholders/departments.
- Learning the results in order to replicate the idea.
- To provide the ideas and solutions for successful implementation.
- To reduce the costs of the energy.

In Germany it turned out that it is very difficult to motivate the stakeholders to participate in the survey without having a specific pilot in this country. But nevertheless, we could get three very interesting interview results.

8. Annexes

- Documentation on decisions of 1st “deployment desk meeting” in Slovenia
- Documentation on decisions of 1st “deployment desk meeting” in Croatia
- Documentation on decisions of 1st “deployment desk meeting” in Austria
- Documentation on decisions of 1st “deployment desk meeting” in Italy
- Documentation on decisions of 1st “deployment desk meeting” in Germany

DOCUMENTATION ON DECISIONS OF 1ST „DEPLOYMENT DESK MEETING”

SLOVENIA

D.T1.1.2

Version: final

10 2019

Title	Documentation on decisions of 1st “Deployment Desk Meeting” in Slovenia
Deliverable	D.T1.1.2
Authors	Katja Karba, Štefan Žohar
Contributors	
Status	final
Reviewed by	
Submission	

Content

1. Summary

This document provides the insight into the 1st deployment desk meeting that have been organised in September 2019 at the Municipality Lendava for pilot process implementation in the frame of Stor4HUC project. The participants were composed from the internal stakeholders (this is to be the employees from Municipality of Lendava) and the external stakeholders (representatives of different public utilities, institutions, and of Development agency Sinergija). The external stakeholders have been invited by the municipality. The meeting has been important for engaging the stakeholders into the process, to be part of the pilot action process implementation (installation of the energy storage in Lendava) and to disseminate a positive information on pilot to wider audience. The original idea to include them into the stakeholder group has been to obtain the information and feedback. Their opinion worth and should be considered to make the commitment on the pilot approval and implementation bigger. The inputs have been recorded and are provided in this report below, the input facilitate the pilot implementation. The participants are aware of the procedure and about the aim of the pilot.

2. Date and place

The 1st Deployment desk in Slovenia was held on 23rd of September 2019 in the City hall of Municipality of Lendava.

3. Number and types of participants/target groups

The meeting was attended by 15 participants. There was different type of the organisations:

- Lendava Primary school – possible multiplier;
- Lendava High school;
- Public utility company;
- Public/city gallery-museum organisation;
- Institute for Tourism and Development Lendava;
- Geological survey Slovenia;
- Municipality of Lendava;
- Public housing company;
- City Library Lendava;
- Local energy agency Pomurje;
- Development agency Sinergija.

4. Topics tackled

The aim of the 1st Deployment desk meeting was to generally present the idea behind the project and to identify the problems, needs and opportunities on EMS and energy storage and energy planning. The representative of Development agency Sinergija Štefan Žohar presented the main idea of the pilot action. He focused on potential technical and logistical solutions of the Paraffin based latent storages in connection with geothermal district heating system in Lendava. The constrains have been highlighted as well, such as the closest connection of the geothermal network, the efficiency of the intended system, the possible energy back-up´s, the costs provided and the location of the installation of the paraffin storage. The discussion followed the presentation which was moderated by Katja Karba.

4.1. Suggested questions

First topic: General questions about EMS and storages in HUCs

international:

- What are the problems on EMS and energy storage planning in HUCs in Slovenia/Lendava?

On regional (and also on national) level we do not have any real good examples on EMS and energy storage planning and investments in HUC´s. So, the energy managers have no experiences in this sector and also often no clear guidelines.

- At the national level, it is common that cooperation is assessed as purely official and often inefficient, although the level of cooperation varies between institutions
- The central government stakeholders are often bureaucratic and sometimes very rigid,
- Slovenia has no regional government. The main instruments/policies are adopted by the Ministry at national level In Pomurje region
- There is almost no connection between different segments / development areas on regional level. Very important is the fact that there is no connection between energy projects and spatial planning – especially in HUC´s. Thus, the connection and coordination between these two different areas is totally necessary and a key aspect to the successful of the regional development in the future. The current situation and approach, within Pomurje region, on integrated planning is increasing but it is still very low. Regional planning is not integrated and there is a low level of understanding and collaboration between these two areas, i.e. spatial and energy planning.

- What are the needs on EMS and energy storage planning in HUCs in Slovenia/Lendava?

On regional (and also on national) level we need real good examples on EMS and energy storage planning in HUC´s.

On the long term we must develop a new long-term Strategic Sustainable Energy Plan with incorporated Regional Action plan for the energy efficiency and exploitation of renewable energy sources (HUC´s included as a special areas) as a basis for future documents.

- What are the opportunities on EMS and energy storage planning in HUCs in Slovenia/Lendava?

In the frame of the current national regulations/restrictions related to cultural/historical protected buildings, we still have space to develop and achieve significant results on EMS and energy storage planning also in HUC´s. Our latent storage pilot will hopefully be a good example for further development in this sector and will hopefully encourage also other cities/energy managers/spatial planners to implement such kind of energy solutions in their HUC´s.

- What experiences does your external stakeholders have with this topic?

The stakeholders attended the first deployment desk meeting don't have specific and concrete experiences with the energy storages. But they find the topic interesting and relevant based on the arguments provided during the discussion. Especially they are curious on the replication effect on other buildings.

- Are there already some other best practice examples?

If we are talking about the connection between geothermal district heating and latent energy storages, there are no other (good or bad) practises in Slovenia, although thermal energy storage technologies and geothermal district heating systems have the potential to play a significant role in the transition towards 100% renewable energy systems through increasing system flexibility and overall efficiency and thus reduce CO_2 emissions and increase domestic energy security, additional reduce the costs of heating.

Also, the use of paraffin cells are innovative buffer storages that have been developed to efficiently store heat and cold generated from small irregular energy sources such as solar energy, heat pumps etc. – so we do not have any known good examples on this.

In case of thermal energy storage technologies (water based) and biomass district heating systems we have some very good examples also in our region (Martjanci, Kuzma, Beltinci…).

Second topic: Pilot specific technical/legal framework conditions

international:

- Short explanation of the targets of your underlying energy concept/plan. Have the various stakeholders agreed on these objectives?

Our pilot is in accordance and in line with the measures and goals of most important strategic action plans of Lendava municipality:

- Sustainable Energy Action Plan of Municipality Lendava (SEAP) - 2012:
  - Measure No.11: Supplementary heating of buildings with geothermal energy from the Lendava geothermal well
  - SEAP target till 2020: Reduction of CO_2 on municipality level: 12.122,41 tonnes (36,2 %) from baseline year 2001
- Local Energy Concept of Municipality Lendava (LEC) - 2012:
  - Measure No.15: Promotion of district heating by geothermal energy
  - Measure goal: The goal is to expand district heating to geothermal energy in the selected area or to connect interested users/public buildings.

Lendava pilot objectives:

- Reduction of energy consumption/share of fossil fuels: 60 MWh (current consumption of heating oil in Lendava Library);

- Reduction of CO_2 Emissions Pollution: 16,8 tons of CO_2 (geothermal energy has an CO_2 emission factor of "0");
- Exploitation of renewable energy – geothermal energy: 57 MWh (savings related to energy storing included);
- Increase of energy efficiency: 5,5% or 3 MWh;
- Implementation and presentation of an innovative way of energy storing;
- Integration of political decision makers/public sector in the development and implementation process of the pilot project – as a basis for further promotion of the project to other sectors and integration of measures into the policies.

- If not, what are their points?
- Are there any critical issues regarding to the cultural heritage protection?

There are a few issues that should be pre-defined and pre-solved with the responsible and competent institution which is Institute for the Protection of Cultural Heritage of Slovenia and which could issue the cultural consent. The general information received so far is that the pilot building (public city library) protected by the law is not protected as a whole building but only the outside of the building (envelop of the building) for which the permission could be received easier than usually.

- What are good KPIs for the pilot plant?

At least the following parameters will be measured/recorded - accurate real-time data for:

- supply temperature (between DHS and heat exchanger)
- supply temperature (between heat exchanger and storage)
- return temperature (between storage and heat exchanger)
- several calorimeter's
- thermal power
- flow
- Etc.

national:

- What is the opinion of the stakeholders about (paraffin based) latent heat storages?

In general, the idea is interesting. The participants are satisfied that the investment will not cause any harmful impact on the environment. They find the idea of heating the premises of the library good idea in order the temperature of the rooms don't drop too much at night.

- Why have they never been installed in Slovenia before?

The pilot is an innovative investment at national level, such installation has not yet been built anywhere in the Slovenia and in this case the pre-investment report will give us clear technical overview/specifications. The reason is that the geothermal energy could be exploited only in the north-eastern part of the Slovenia (especially in Pomurje region) as the potential is a lot better in this part of the country. The idea of the latent thermal storage is quite new also.

- Does anyone have some experiences with this kind of storages anyway?

Not actually, but in any case, the investment can serve as an example of good practice in the project area-example of innovative solution of storing renewable energy in an effective way. After the investment an effective monitoring report will be prepared using energy management tool developed to see the results of the investment (CO_2 savings, kWh savings, cost savings, etc.).

- Are there some other possible solutions? /Why is the latent heat storage the best option?

Our pilot building (Lendava Library) will be the last connection in the geothermal district network/grid and the supply is NOT stable - the temperatures are and will not be constant also in the future. This was the main reason, why they didn´t changed the fossil fuel in this building yet - the storage in our pilot is CRUCIAL for us, to change the heating source into RES. The storage will in this case ensure the stable supply for end-users. The advantage of paraffin used storages before regular water storages: requires less space, which is very important especially in case of Lendava library.

Third topic: Pilot specific social/political aspects

international

- Who are the main actors and how are they connected?

The main actor of the pilot is a provider of the geothermal energy and the owner of the geothermal network/district heating system in Lendava city. They are Petrol Geo. The second main actor is Municipality of Lendava, the financer and the end-user of the storage. The next important actors are the Lendava library where the storage will be located and the Institute for the Protection of Cultural Heritage of Slovenia that commands the legal requirements.

- How effectively policy development and implementation are integrating relevant economic, social, energy and environmental aspects?

Municipality of Lendava implements the measures and goes in line with the guidelines of their Local Energy Concept, which represents their concept of developing a self-governing local community in energy supply and use, which in addition to energy supply plans includes measures for energy efficiency, cogeneration of heat and electricity and the use of renewable energy sources. And together with other strategic documents (SECAP, Municipal Spatial Plan, etc.) their follow also the aspects of economic, social and environment.

- What will be the benefits for the citizens, respective end-users / for the municipality / for the surrounding neighbourhood?

As a snow ball effect and as an added value other municipalities and regions will benefit from the good practice case and experiences. The pilot case will serve as a show-character for EE/RES measures on the transnational and regional level. The Municipality of Lendava is quite interesting in the replication effect of the pilot, to apply the pilot in other public buildings (e.g. schools, kindergartens). At the meeting there was also the representative of the Public housing company that manages the residential buildings. If the pilot will be successful story the company could replicate the idea in the apartment blocks, in that way the citizens could benefit as well.

- How evident are they for your municipality?

There are several advantages of latent paraffin-based storages against the “usual” thermal heat storages: Require less space – smaller dimensions; Less temperature loss; Less reactivity with the environment and less likelihood of leakage as it changes phases; Better heat transfer performances=higher efficiency=lower heating costs.

- How may the project Store4HUC influence your municipal policy strategy?

The pilot and the project itself will have the positive impact on the municipal policy. If the pilot shows the success and the good results, the municipality could focus more on geothermal energy and proposed the measures linked to the pilot solutions.

- What are the targets for your stakeholders for participating in the deployment desk (self-assessment)?

- Learning something new and gain the knowledge.
- Improvement of collaboration and communication between different sectors/stakeholders/departments.
- Learning the results in order to replicate the idea.
- The provide the ideas and solutions for successful implementation.
- To reduce the costs of the energy.

5. Implemented actions and links to deliverables, outputs

The meeting was held in the moderated way, first the presentation was carried out, then the questions were asked by the moderator. It was used the PowerPoint presentation. The questions have been divided into three topics:

- General questions about EMS and storages in HUCs.
- Pilot specific technical/legal framework conditions.
- Pilot specific social/political aspects.

The participants were invited by Municipality of Lendava. They received the invitation and were phoned as well to ensure the attendance. The same participants attended also Kick-off event (D-C.6.7) for launching the pilot.

6. Results, effects and the response

The participants were positive in terms of the new idea and the pilot storage presentation. The discussion followed by the presentation was long and intensive, all participants provided the feedback and their opinion. The comments provided are useful for the further work and brought added value. The participants were curious if the storage also consumes additional energy for operation. The replication of the idea was also discussed and how much should (additional) storages differ compared to the pilot storage (are there modification required and possible). It was pointed out that the optimisation of the storages is necessary. E.g. the pilot storage should be filled in the peak when the water is the hottest. The old boiler heated by fossil fuel will remain in case the temperate outside in the winter will be low (around -20 degrees). Just in case the location for the storage should be again checked, but after careful spot check the storage will be located in the library itself and not in the building close to the library.

The representative from the public Housing company that managing several residential blocks, provided productive feedback, namely he stressed out that heating the building at night makes sense when the temperatures drop down to 0 degree. He is interested to apply the idea into several residential blocks. At the moment they have optimal heating system which based also on the geothermal energy. He asked also why not install the solar PV, instead of thermal storage.

The paraffin-based storage was selected due to small volume that occupies in the boiler room. The director of the library highlighted a few issues that it should be considered when planning. These are: in library are still old cast iron radiators and the old windows, all these aspects could reduce the effect of the storage and the question arise whether to first manage the energy efficiency of the building and then exploit the renewable energy sources. How the library (the municipality actually as it is the owner of the building) will maintain the system if it is not energy efficient. Although the director hesitates, he supports the storage installation and is looking forward for reduction of the costs. The representative of the Local energy agency Pomurje argue that the costs could be reduced for around 50% and the heating is possible also with the old radiators. The investment could be reimbursed in 7 years and it has positive environmental and economic impact.

The participants were satisfied with the event.

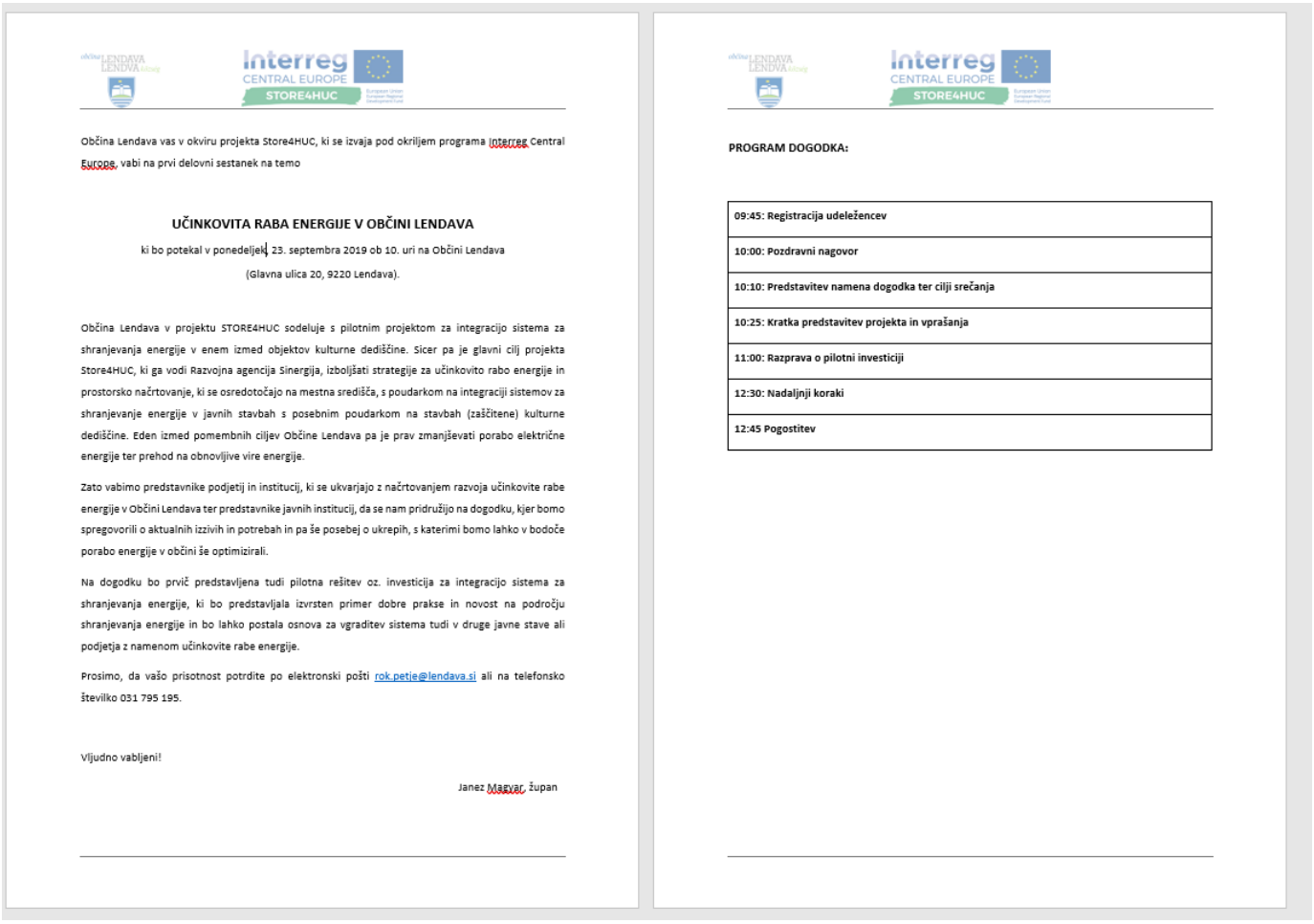
7. Conclusion

The event was successful as the participant were beneficial and actively involved in the discussion. Each of them presented their point of view. In the future events they requested to present more concrete technical solution and operation of the storage. They liked the innovative topic which is attractive and did like also the exchange of opinions. Common argument for proceeding towards the pilot was that it does not produce any emissions, so it is green/clean solution. The pilot idea will be implemented and will serve as a role model for other institutions.

At the meeting a valuable feedback was gained which will facilitate the further work on the pilot. The stakeholders are engaged and will cooperate in the future meetings.

8. Annexes

8.1. Invitation and Agenda



Občina Lendava vas v okviru projekta Store4HUC, ki se izvaja pod okriljem programa Interreg Central Europe, vabi na prvi delovni sestanek na temo

UČINKOVITA RABA ENERGIJE V OBČINI LENDAVA

ki bo potekal v ponedeljek, 23. septembra 2019 ob 10. uri na Občini Lendava

(Glavna ulica 20, 9220 Lendava).

Občina Lendava v projektu STORE4HUC sodeluje s pilotnim projektom za integracijo sistema za shranjevanja energije v enem izmed objektov kulturne dediščine. Sicer pa je glavni cilj projekta Store4HUC, ki ga vodi Razvojna agencija Sinergija, izboljšati strategije za učinkovito rabo energije in prostorsko načrtovanje, ki se osredotočajo na mestna središča, s poudarkom na integraciji sistemov za shranjevanje energije v javnih stavbah s posebnim poudarkom na stavbah (zaščitene) kulturne dediščine. Eden izmed pomembnih ciljev Občine Lendava pa je prav zmanjševati porabo električne energije ter prehod na obnovljive vire energije.

Zato vabimo predstavnike podjetij in institucij, ki se ukvarjajo z načrtovanjem razvoja učinkovite rabe energije v Občini Lendava ter predstavnike javnih institucij, da se nam pridružijo na dogodku, kjer bomo spregovorili o aktualnih izzivih in potrebah in pa še posebej o ukrepih, s katerimi bomo lahko v bodoče porabo energije v občini še optimizirali.

Na dogodku bo prvič predstavljena tudi pilotna rešitev oz. investicija za integracijo sistema za shranjevanja energije, ki bo predstavljala izvrsten primer dobre prakse in novost na področju shranjevanja energije in bo lahko postala osnova za vgraditev sistema tudi v druge javne stave ali podjetja z namenom učinkovite rabe energije.

Prosimo, da vašo prisotnost potrdite po elektronski pošti rok.petje@lendava.si ali na telefonsko številko 031 795 195.

Vljudno vabljeni!

Janez Magyar, župan

PROGRAM DOGODKA:

09:45: Registracija udeležencev
10:00: Pozdravni nagovor
10:10: Predstavitev namena dogodka ter cilji srečanja
10:25: Kratka predstavitev projekta in vprašanja
11:00: Razprava o pilotni investiciji
12:30: Nadaljnji koraki
12:45 Pogostitev

8.2. List of participants

Interreg CENTRAL EUROPE European Union European Regional Development Fund
STORE4HUC

D.T1.1.2: 1. srečanje deležnikov in D.C.6.7: Kick-off srečanje za pilot, Lendava, 23.09.2019

Page 2

Interreg CENTRAL EUROPE European Union European Regional Development Fund
STORE4HUC

Page 3

8.3. Pictures

8.4. Media coverage

The media announcements were at the 2 online local news media: Lendava info and Lendava danes.

The links are provided in the next chapter.

8.5. Web-links

http://lendavainfo.com/pilotni-projekt-za-integracijo-sistema-za-shranjevanje-energije-v-lendavski-knjiznici/

http://lendavadanes.si/sl/blog/sodelovanje-delavnica-v-okviru-projekta-store4huc
https://www.kl-kl.si/360/

DOCUMENTATION ON DECISIONS OF 1ST „DEPLOYMENT DESK" MEETING **CROATIA**

D.T1.1.2

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10 2019

Title	Documentation on decisions of 1st “Deployment Desk” Meeting in Croatia
Deliverable	D.T1.1.2
Authors	Alois Kraußler, Robert Pratter, Matija Hrupački, Mario Vašak
Contributors	Filip Rukavina, Kristina Radoš Cvišić, Kristijan Škoc, Vinko Lešić, Mateja Car
Status	final
Reviewed by	
Submission	

Content

1. Summary

This document contains minutes on the 1st deployment desk meeting organized in Zabok where the pilot site Bračak Manor is located. It demonstrates decisions of the deployment desk meeting connected to identification of problems, needs and opportunities on EMS and energy storage planning.

The recently renovated Bračak Manor is already equipped with wood pellets boiler for heating, micro CHP for hot water and power production during summer, air-water heat pump system for cooling and heating in transitional periods, wall insulation on the inside and energy efficient windows and doors, efficient lighting system, HVAC system, advanced central BMS for monitoring of heating, cooling and energy consumption, rainwater harvesting for irrigation of green areas and wastewater treatment as well as electric vehicle charging station. It is planned to add a properly sized photovoltaic system and battery storage to it (up to 10 kWp and 10 kWh). The already existing systems will be combined with the new ones through an advanced energy management ICT system that can be built on top of the already existing central monitoring system as a coordination service that optimally exploits different available assets. The introduced energy management system will inherit the preview projects (3Smart) in which its modular parts for central HVAC system level management of heat production via micro CHP and wood pellets boiler and heat storage will be combined with the photovoltaic and battery system introduced on the top-level (microgrid-level) of the pilot site operation.

The main target of the first Deployment desk meeting was to bring together all so far envisioned relevant stakeholders, present the pilot planning to them, receive their initial feedback and agree on the next steps related to pilot deployment as well as their involvement. Deployment desk meeting was the first of four deployment desk meetings and focus was on the integration of stakeholders as well as selected players whose support will be needed for the future implementation of the pilot systems. The meeting was attended by representatives of the Krapina-Zagorje County, Conservation Office in Krapina, Croatian electricity distribution system operator (HEP-ODS), Ministry of Construction and Physical Planning, Zagorje Development Agency (ZARA), Croatian Association of Historic Towns (HUPG) and representatives of project partners University of Zagreb Faculty of Electrical Engineering and Computing (UNIZGFER) and North-West Croatia Regional Energy Agency (REGEA). As the meeting was leaned to the kick-off event in Croatia with the same participants, all participants were already at the meeting acquainted with the general information about the Store4HUC project: programme Interreg Central Europe, Programme priority and specific objective, information about project partners, project duration, pilots and work packages. The meeting was organized as an open discussion where the planned interventions on Bračak Manor were first explained from the investment point of view (REGEA) as well as the energy management and IT point of view (UNIZGFER). After that it was discussed about pilot site Bračak implementation with focus on potential technical, conservation and economic barriers linked to pilot action in Croatia.

2. Date and place

Deployment desk meeting was held on September 16, 2019 at the pilot site of the Bračak Manor (Energy Centre Bračak), Bračak 4, 49210 Zabok, Croatia.

3. Number and types of participants/target groups

The meeting was attended by 21 people in total.

- Owner of Bračak Manor (Krapina-Zagorje County) representatives: one person
- Ministry of Construction and Physical Planning authorities: four persons
- Cultural heritage preservation authorities: two persons
- HUPG representatives: one person
- Infrastructure and (public) service provider – HEP Distribution System Operator: one person
- Sectoral agency: one person
- Pilot site users (employees of REGEA on the pilot site): four persons
- Local pilot experts from REGEA: four persons
- energy management tool developers – UNIZGFER representatives: three persons
-

4. Topics tackled

In the first part of the Deployment desk meeting, through the ppt presentation the stakeholders were provided with the information and planning related to the Croatian pilot site project where it is planned to add a properly sized photovoltaic system and battery storage to it (up to 10kWp and 10kWh). Also, it was discussed about energy management ICT system that will be built on top of the already existing central monitoring system as a coordination service that optimally exploits different available assets. Also, the discussion was guided in order to answer some previously identified issues by the Store4HUC consortium, common for the whole Central Europe, or regional/local issues.

4.1. Suggested questions

First topic: General questions about EMS and storages in HUCs

international:

- What are the problems on EMS and energy storage planning in HUCs in your Croatia/Bračak?

The problems in implementing EMS and energy storage planning in HUC in North-west Croatia are:

- strict conservation rules, and slow administration,
- lack of interest due to increased investment.

- What experiences do your external stakeholders have with this topic?

In an open discussion, during the deployment desk meeting, we found out that stakeholders have experience in implementing photovoltaic systems with battery storages, and they are also familiar with the possibilities of integrating different assets into a central monitoring system but not in implementing such systems in HUC, so they think this pilot project is a great opportunity to gain extra knowledge and experience.

- Are there already some other best practice examples?

In Croatia there are very few examples of good practice, but as an example is recognized Spiritual Education Center Mary's Palace near Zaprešić, and Bračak Manor which is the pilot building on Store4HUC project.

Second topic: Pilot specific technical/legal framework conditions

international:

- Short explanation of the targets of your underlying energy concept/plan. Have the various stakeholders agreed on these objectives?

Within the pilot site Bračak it is planned to add a properly sized photovoltaic system and battery storage to it (up to 10 kWp and 10 kWh). The already existing systems will be combined with the new ones through an advanced energy management ICT system that can be built on top of the already existing central monitoring system as a coordination service that optimally exploits different available assets. The introduced energy management system will inherit the preview projects (3Smart) in which its modular parts for in which its modular parts for central HVAC system level management of heat production via micro CHP and wood pellets boiler and heat storage will be combined with the photovoltaic and battery system introduced on the top-level (microgrid-level) of the pilot site operation. All stakeholders agreed on these objectives. Furthermore, the usage of IT and energy management to best exploit the assets installed was found very needed for HUCs in order to keep the physical interventions as minimal as possible for the targeted performance at the end.

- Are there any critical issues regarding to the cultural heritage protection?

So far, we have not identified any critical issues regarding to the cultural heritage protection. It is clear that the photovoltaic system cannot be attached directly to the building and its positioning in the manor surrounding was discussed where a car pot was agreed as a good position for it.

- What are good KPIs for the pilot plant?

Good Key Performance Indicators for the pilot action in Croatia are direct savings on electricity bills, Increasing the use of RES and reducing CO2 emissions, Increasing energy independence.

national / pilot specific issues

- Short description of the energy management tool. What do your stakeholders think about the EMS concept in particular?

The pilot site in Bračak is an example of a historical urban site where recently significant integration and refurbishment efforts have been already done, making it already now a site with class A energy certificate. Energy management tool will plan optimal operation of the installed battery energy storage system with photovoltaic system, operation of the combination of wood pellets boiler and micro Combined Heat and Power (CHP) plant and the remaining HUC energy relevant systems. Stakeholders are enthusiastic about the idea of EMS concept. They like the way we plan to monitor and predict energy consumption and production in the Bračak Manor through the central building management and control system, as well as to manage heat production assets, heat storage and battery storage to gain optimum performance in accordance with KPIs listed above.

Third topic: Pilot specific social/political aspects

international

- Who are the main actors and how are they connected?

Main actors are representatives of the Krapina-Zagorje County, Conservation Office in Krapina, Croatian electricity distribution system operator (HEP-ODS), Ministry of Construction and Physical Planning, Zagorje Development Agency (ZARA), Croatian Association of Historic Towns (HUPG) and their field of work is not closely connected but they collaborate institutionally on different projects.

- What will be the benefits for the citizens, respective end-users / for the municipality / for the surrounding neighbourhood?

Bračak Manor is a public building open to all citizens, respective end users and it is used as a central place for organizations, companies and institutions interested in renewable energy as well as for small and medium companies from other sectors. The main objective of the energy centre located in Bračak Manor is continuing education, exchange of experience and information to all stakeholders on the sustainable use of energy, so this will continue in the future.

national / pilot specific issues

- What do your stakeholders think about the replication of the concept in Bračak?

Stakeholders recognized the Bračak Manor as an excellent example of how-to energy refurbish a cultural heritage building in accordance to best energy efficiency practices and use of renewable energy sources, and they agree that the practice should be replicated to other HUC buildings. In that respect, Ministry of Construction and Physical Planning wanted to be closely informed about the further developments both on the Croatian pilot and also on the other Store4HUc pilots since they are in a process of drafting technical regulations for energy renovation of protected sites and clear performance figures and practical examples are very important to them now.

- Would for example an installation like this also be possible in the HUC of Zagreb?

Such an installation could certainly be replicated in the HUC of Zagreb.

- Is it easy to get the permits for PV installations in HUCs in Croatia?

Obtaining permission to install photovoltaics installations in Historical urban sites in Croatia depends on various factors. Most important factor are Conservation permits, because the design solution of PV must not disturb the exterior view of the building. Since protected buildings differ in size and shape, conservation requirements may vary from building to building or site to site.

5. Implemented actions and links to deliverables, outputs

We have approached stakeholders by contacting them by e-mail and phone. For the first Deployment desk meeting we provided roll-up as a promotional project material. This deliverable relates also to D.T1.1.1 deliverable which outlines the deployment desks concept on Store4HUC.

6. Results, effects and the response

The most important achievement of the first Deployment desk meeting in HR is that we have brought together in one place all the relevant institutions and organizations needed to properly discuss open questions and potential obstacles that we could potentially encounter during implementation of the pilot in Bračak Manor. The stakeholders especially liked the fact that we gave them the opportunity to be actively involved in the implementation of the project and the way we approached them, which is confirmed by anonymous feedback on an anonymous questionnaire that we shared after the meeting. After the meeting, we collected a total of 17 feedback forms.

Statistic from anonymous feedback forms:

Registration process	98,82% satisfied stakeholders
Location	100% satisfied stakeholders
Venue	100% satisfied stakeholders
Drinks	100% satisfied stakeholders
Food	100% satisfied stakeholders
Presenters	100% satisfied stakeholders
Hygiene	100% satisfied stakeholders
Content	98,82% satisfied stakeholders
How would you generally rate the meeting	100% satisfied stakeholders

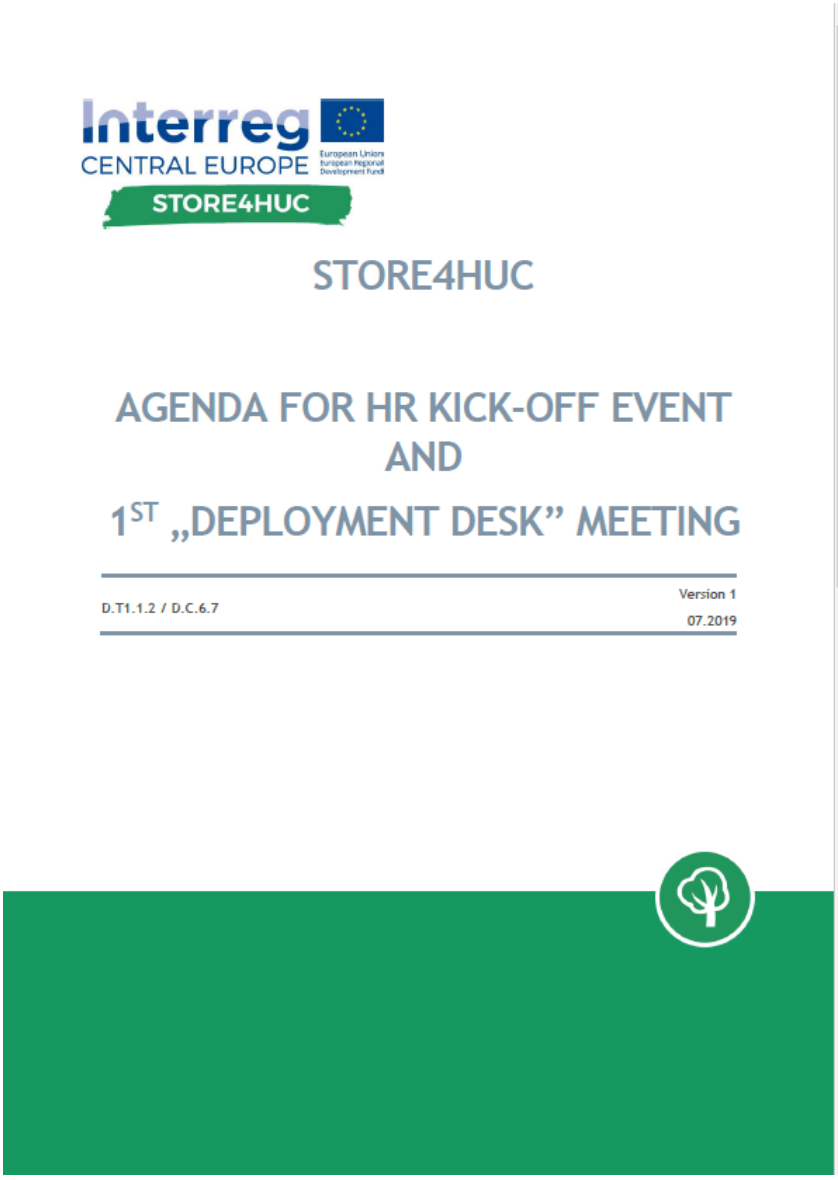
7. Conclusion

By establishing the stakeholder deployment desk, we will reach the relevant players to share the knowledge and transfer it to other additional audience. First Deployment desk meeting was held on 16 September 2019, at the location of Bračak Manor - location of the Croatian Store4HUC pilot. At the meeting were invited all relevant stakeholders, to inform them about the planned pilot action and to receive feedback from them. The meeting was attended by representatives of the Krapina-Zagorje County, Zagorje development agency, Ministry of Culture of the Republic Croatia – Conservation office in Krapina, Ministry of Construction and Physical Planning, Croatian Association of Historic Towns, University of Zagreb Faculty of Electrical Engineering and Computing, and North-West Croatia Regional Energy Agency. After the initial presentation of the project performed within the kick-off event leaned to the deployment desk meeting, the stakeholders were introduced to the pilot project Bračak and were explained what is planned through the project. After that, a discussion was opened to identify technical, economic and conservation barriers related to the implementation of energy efficiency measures and renewable energy sources and energy storages in Historical urban centres in Croatia. The discussion was of an open character where stakeholders presented separately their views while focusing on their area of expertise.

8. Annexes

8.1. Invitation and Agenda

Agenda



STORE4HUC

AGENDA FOR HR KICK-OFF EVENT
AND
1ST „DEPLOYMENT DESK" MEETING

D.T1.1.2 / D.C.6.7

Version 1
07.2019

Inicijalno predstavljanje projekta Store4HUC u Hrvatskoj (HR kick-off) i prvi sastanak dionika pri provedbi investicije u spremnike energije na zaštićenoj lokaciji dvorca Bračak (HR deployment desk meeting)

Datum: 16. rujna 2019.

Lokacija : Energetski centar Bračak - dvorac Bračak; Bračak 4

Vrijeme: 12:00 h

Terminski plan događanja

Inicijalno predstavljanje projekta Store4HUC

- 12:00: Doček sudionika ispred dvorca Bračak
- 12:10: Pozdravni govor domaćina (REGEA)
- 12:20: Kratka prezentacija projekta Stoe4HUC (FER)

Croatian deployment desk meeting No. 1

- 12:40: Upoznavanje sudionika s temama i ciljevima HR deployment deska (REGEA)
- 13:00: Prezentacija - Investicije u sklopu projekta Store4HUC (FER)
- 13:20: Obilazak uz prezentaciju - Pilot projekt Bračak (REGEA)
  - Ugradnja fotonaponskog sustava kraj dvorca Bračak (REGEA i FER)
  - Ugradnja baterija za skladištenje energije dobivene putem fotonaponskih ćelija u dvorcu Bračak (REGEA i FER)
  - Integracija fotonaponskog i baterijskog sustava u postojeći pametni sustav upravljanja zgradom (REGEA i FER)
- 13:45 Fotonaponska elektrana na krovu Opće bolnice Zabok (REGEA)
- 13:50: Pitanja i odgovori
- 14:00: Druženje uz ručak

Page 1

8.2. Presentations from the event

Themes and goals of HR deployment desk and general information about the Croatian pilot and its initial state:

Pilot action with focus on energy management and its related IT:

8.3. List of participants

List of participants

Inicijalno predstavljanje projekta Store4HUC u Hrvatskoj pri provedbi investicije u spremnike energije na zaštićenoj lokaciji dvorca Bračak (HR deployment desk meeting)

Datum: 16. rujna 2019.
Lokacija: Energetski centar Bračak - dvorac Bračak; Bračak 4
Vrijeme: 12:00 h

"Osobne podatke koje REGEA i Fakultet elektrotehnike i računarstva, Sveučilište u Zagrebu prikupljaju na potpisnim listama prikupljaju se dana 16.9.2019. od 11 do 15 sati u svrhu provedbe projekta pod nazivom Store4HUC, odnosno, u svrhu evidencije i dokaza broja sudionika na prvom radnom sastanku (HR deployment desk meeting, HR kick-off), slijedom čega se isti neće upotrebljavati za niti jednu drugu svrhu osim ovdje navedene, te se isti neće dostavljati bilo kojim trećim osobama u Republici Hrvatskoj i/ili inozemstvu."

"Svi sudionici radnog sastanka projekta Store4HUC dana 16.9.2019. od 11 do 15 sati mogu biti fotografirani za potrebe vidljivosti, a fotografije mogu biti korištene za potrebe slanja priopćenja za medije, za potrebe objava na društvenim mrežama, te u druge reklamne i/ili promidžbene svrhe. Fotografiranje će obaviti Matija Hrupački i Kristijan Skoc. Ako ne želite biti na fotografiji, odnosno, ako ne želite da se Vaša fotografija koristi za potrebe slanja priopćenja za medije i/ili objave na društvenim mrežama i/ili u druge reklamne ili promidžbene svrhe molimo da se obratite na mail ibelic@regea.org."

Regionalna energetska agencija Sjeverozapadne Hrvatske i Fakultet elektrotehnike i računarstva, Sveučilište u Zagrebu postupaju u cijelosti u skladu s odredbama UREDBE (EU) 2016/679 EUROPSKOG PARLAMENTA I VIJEĆA od 27. travnja 2016. godine o zaštiti pojedinaca u vezi s obradom osobnih podataka i o slobodnom kretanju takvih podataka te o stavljanju izvan snage Direktive 95/46/EZ (Opća uredba o zaštiti podataka).

Potpisna lista

[redacted]

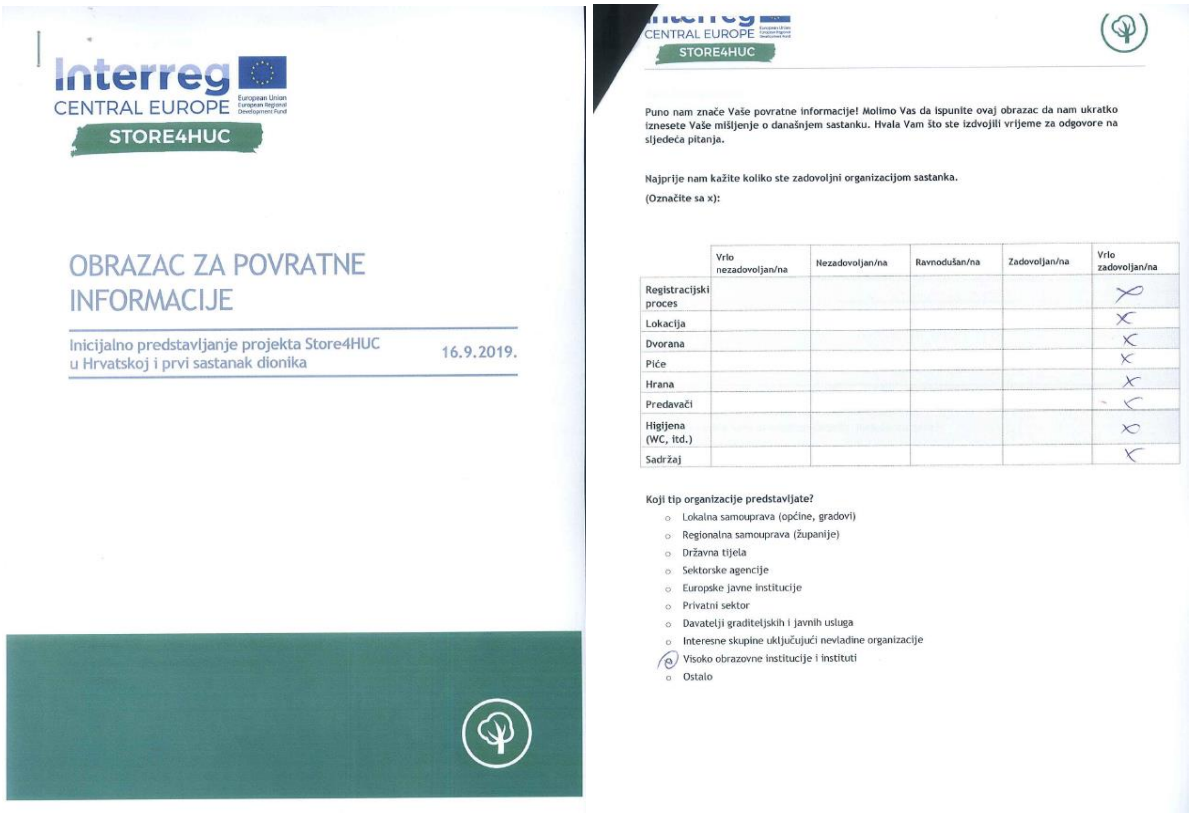
[redacted]

8.4. Pictures

Figure 1: Deployment desk meeting - presentation

Figure 2: Deployment desk meeting - presentation

8.5. Feedback form



Interreg CENTRAL EUROPE
STORE4HUC

OBRAZAC ZA POVRATNE INFORMACIJE

Inicijalno predstavljanje projekta Store4HUC u Hrvatskoj i prvi sastanak dionika — 16.9.2019.

Puno nam znače Vaše povratne informacije! Molimo Vas da ispunite ovaj obrazac da nam ukratko iznesete Vaše mišljenje o današnjem sastanku. Hvala Vam što ste izdvojili vrijeme za odgovore na sljedeća pitanja.

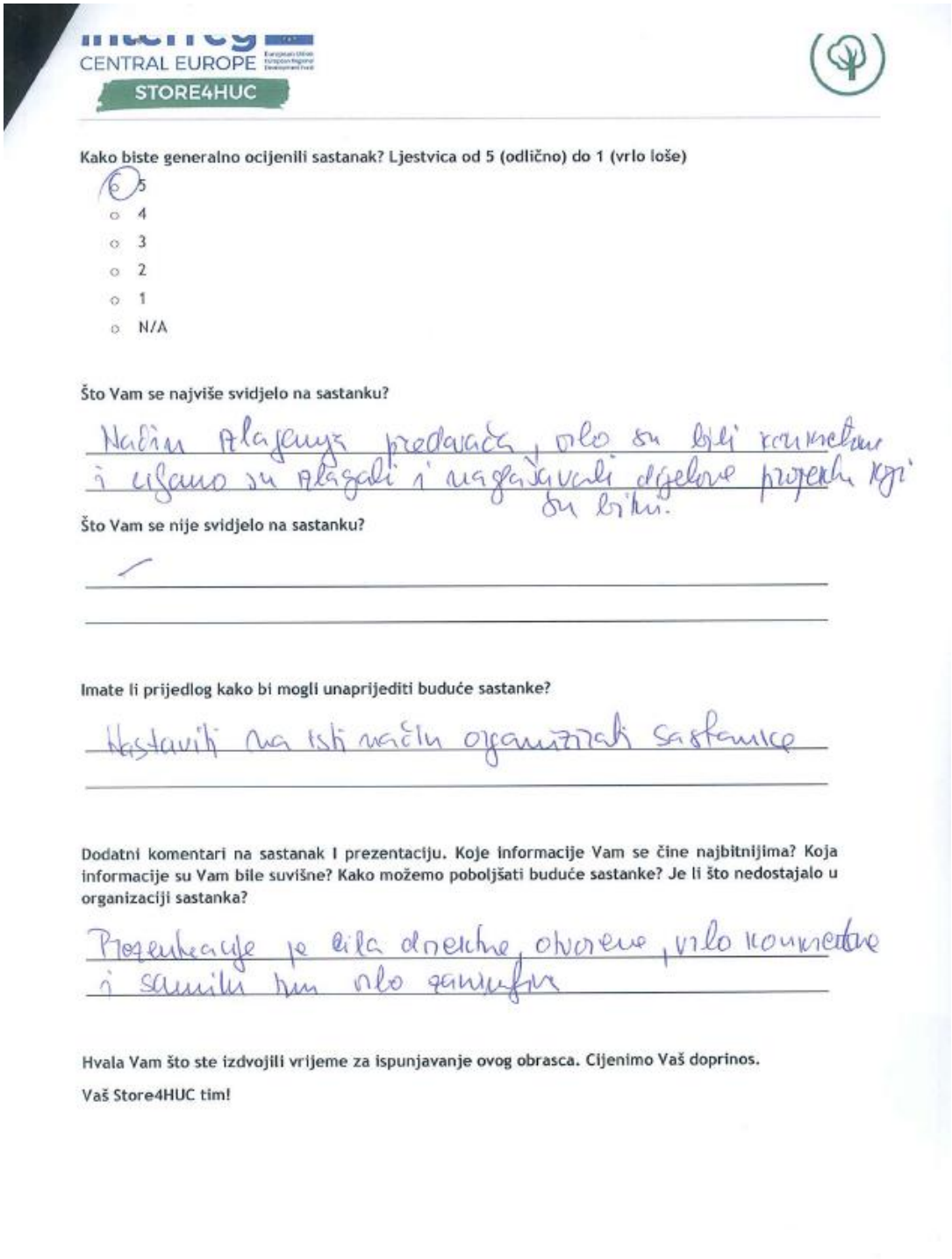
Najprije nam kažite koliko ste zadovoljni organizacijom sastanka.

(Označite sa x):

	Vrlo nezadovoljan/na	Nezadovoljan/na	Ravnodušan/na	Zadovoljan/na	Vrlo zadovoljan/na
Registracijski proces					✓
Lokacija					X
Dvorana					X
Piće					X
Hrana					X
Predavači					X
Higijena (WC, itd.)					X
Sadržaj					X

Koji tip organizacije predstavljate?

- o Lokalna samouprava (općine, gradovi)
- o Regionalna samouprava (županije)
- o Državna tijela
- o Sektorske agencije
- o Europske javne institucije
- o Privatni sektor
- o Davatelji graditeljskih i javnih usluga
- o Interesne skupine uključujući nevladine organizacije
- ✓ Visoko obrazovne institucije i instituti
- o Ostalo



CENTRAL EUROPE

STORE4HUC

Kako biste generalno ocijenili sastanak? Ljestvica od 5 (odlično) do 1 (vrlo loše)

- (5)
- 4
- 3
- 2
- 1
- N/A

Što Vam se najviše svidjelo na sastanku?

Način izlaganja predavača, oni su bili koncretni i ciljano su izlagali i naglašavali dijelove projekta koji su bitni.

Što Vam se nije svidjelo na sastanku?

/

Imate li prijedlog kako bi mogli unaprijediti buduće sastanke?

Nastaviti na isti način organizirati sastanke

Dodatni komentari na sastanak I prezentaciju. Koje informacije Vam se čine najbitnijima? Koja informacije su Vam bile suvišne? Kako možemo poboljšati buduće sastanke? Je li što nedostajalo u organizaciji sastanka?

Prezentacije je bila dinamične, otvorene, vrlo konkretne i sadržaju ima vrlo zanimljiva

Hvala Vam što ste izdvojili vrijeme za ispunjavanje ovog obrasca. Cijenimo Vaš doprinos.

Vaš Store4HUC tim!

8.6. Media coverage

Link: https://www.zagorje-international.hr/index.php/2019/09/18/odrzan-prvi-u-nizu-sastanaka-jedan-od-ciljeva-je-i-nova-investicija-na-dvorcu-bracak/

Figure 3: Article published in local newspaper

8.7. Web-links

Link to the announcement published by the REGEA official Facebook page during the meeting

Link: https://www.facebook.com/regeaSZhr/posts/3036856046455105

DOCUMENTATION ON DECISIONS OF 1ST „DEPLOYMENT DESK" MEETING **AUSTRIA**

D.T1.1.2

Version: final
10 2019

Title	Documentation on decisions of 1st “Deployment Desk” Meeting in Austria
Deliverable	D.T1.1.2
Authors	Andrea Dornhofer, Rafael Bramreiter, Alois Kraußler, Robert Pratter
Contributors	
Status	final
Reviewed by	
Submission	

Content

1. Summary

The focus of the demonstration site will be on the integration of a thermal storage for the church on Weizberg, which is connected to a small public district heating grid. For the local deployment desk 14 stakeholders have been identified in a first stage. In the kickoff meeting in total 10 stakeholders (4 internal stakeholders, who are already part of the project team; 6 external stakeholders, mostly local authorities or members of the biomass network) participated. In the second deployment desk meeting in September 9 stakeholders have attended. Within this meeting the procedure of implementing the storage system and also the historical protection issues were discussed. Additionally, the timeframe of the implementation phase and some financing issues are discussed. The funding of the storage system is not part of the project and is done with the help of external resources.

2. Date and place

In Weiz more deployment desk meetings than specified in the proposal are planned. That is why already two deployment desk meetings have taken place until now. The deliverable summarizes the results of both meetings.

- 14th of June, 7 pm
- 11th of September, 8 am
- Weiz, Gasthof Ederer, Weizberg 2, 8160 Weiz

3. Number and types of participants/target groups

The first meeting was attended by 10 participants, 4 internal and 6 external ones

The second meeting was attended by 9 participants, 3 internal and 6 external ones

4. Topics tackled

The main scope of the present deployment desk meeting was to design the solutions (storage system implementation and energy savings for the parish church of Weizberg) together with the involved stakeholders. The procedure backgrounds and targets of the deployment desk were also shown and discussed.

The obtained storage solutions and energy saving actions requires the active involvement of all members of the deployment desk. Another important task of the deployment desk was the definition of the monitoring of the actions, which will be implemented. It should be decided within the meetings of the deployment desks, how to create one or more workshops of practical nature, mostly addressed to municipal employees, biomass heating members, or technicians. The aim of the workshops is to present the measures which have been implemented in the participating regions (especially in the pilot of Weiz) and on the other hand to improve the cooperation between those regions in order to exchange experiences and good practice examples.

4.1. Suggested questions

First topic: General questions about EMS and storages in HUCs

international:

- What are the problems on EMS and energy storage planning in HUCs in Austria/Weiz?

HUCs are in Austria subject to the building and spatial planning laws of the provinces and the Austrian Historic Buildings Acts. Protection of the local historic sites and historic buildings is guaranteed by respective local historic buildings protection zones, which is executed by a local historic building expert within the framework of building approvals. Structural changes according to the respective zoning plan, as for example in Weiz, therefore requires a building licence including a positive local landscape protection evaluation

- What are the needs on EMS and energy storage planning in HUCs in Austria/Weiz?

The Weizberg heating plant, as a pilot and best practice plant for Austria, was built below the existing site level due to the requirements for buildings within a HUC. The planned extension to accommodate a storage, a machine room, a control room, a retaining wall as well as the associated changes in terrain thus have a direct impact on the existing landscape. Therefore, the following requirements and needs have to be fulfilled locally and also nationally due to the approval situation:

(1) Mostly implementation below terrain and surface level,

(2) utilization of existing buildings to cover the extension and associated restrictions regarding the dimensions of the new building,

(3) specially adapted design of the visible facades with regard to colour and geometry while complying with the requirements for weather resistance,

(4) minimally invasive integration, in order not to influence existing natural conditions such as trees and bushes.

- What are the opportunities on EMS and energy storage planning in HUCs in Austria/Weiz?

Creative, intelligent and "smart" solutions are currently in demand at local and regional level in order to be able to supply those buildings or urban districts that are protected as historical monuments or townscapes with renewable energy sources and to optimise them in terms of energy efficiency in the future, particularly at local, national and transnational level. Such a local, national and European best-practice solution would be the innovative use of a thermal energy storage system within the monument or heritage protection zone of the Weizberg Basilica.

The pilot plant biomass heating plant Weizberg already offers a CO_2 neutral and 100 % renewable heat supply with wood as energy source. However, the plant is currently inefficient due to a lack of thermal energy storages. More wood is burned than necessary and the locally limited land consumption and life cycle footprint is considerably higher than necessary.

The integration of a thermal energy storage into the existing heating plant can counteract this and contribute to a more efficient use of resources and land. In addition, the use of regional forest chips by regional farmers ensures that the added value remains in the country or region.

- What experiences does your external stakeholders have with this topic?

The heating plant has been in operation since 1999, which is why the individual project partners have many years of specialist experience. Within the framework of the project, the following four stakeholders in particular were identified as central knowledge carriers:

(1) Biomass heating plant Weizberg reg. cooperative mbH

Role: Owner and operator of the local heating network

Founded in 1999 and built the Weizberg biomass heating plant. Has been operating the biomass heating plant for 20 years now with the help of 24 innovative farmers.

(2) Technical office Ing. Haas Ges.m.b.H.

Role: Executing HLKS company

Active in the HLKS industry since 1982. Many years of experience in the construction, operation and maintenance of biomass local heating networks. Since the beginning of 1999 responsible for operation, maintenance, repair and expansion projects of the Weizberg biomass heating plant.

(3) W.E.I.Z - Weizer Innovation Centre:

Role: PP3 Store4HUC - regional responsible PP

The Weizer Energie- Innovations-Zentrum GmbH (W.E.I.Z.) as a regional contact point for the main topics "Energy" and "Innovation" is an important initiator for the economic structural change in the region of Eastern Styria. As a network-oriented partner for economic development, the W.E.I.Z. is now known beyond the region as a contact point for sustainable activities, especially in the areas of "ecological building & living, energy efficiency and renewable energies". Focal points include energy innovations in the areas of waste heat recovery from industrial plants, CHP based on biomass (wood gasification, electric generators), as well as the development and promotion of regional energy concepts - energy analyses (national and international projects: MultiTransfer, PEACE_Alps. SoWeiTconnected, WEIZconnected; CitiEnGov, SUI, SynEnergie, Quick Bio Net, etc..)

(4) AEE INTEC - Institute for Sustainable Technologies

Role: Advisory Research Institute

AEE - Institute for Sustainable Technologies (AEE INTEC) is an independent research institute in the field of renewable energies and resource efficiency. Since its foundation in 1988, the institute has developed into one of the leading European institutions for applied research in this field. The group "Thermal Storage" has been involved in a large number of national and international projects with a focus on energy storage (EU project: CREATE, SCORES, COMTES; National flagship projects: giga_TES, Tes4seT; IEA SHC Tasks and IEA ECES Annexes). In particular, the design, development and demonstration of components for thermal energy storage systems can be considered as expertise.

- Are there already some other best practice examples?

The building W.E.I.Z. 4 is a customized research house for the Institute of "Materials" of the JOANNEUM RESEARCH Forschungsgesellschaft m.b.H. The building was successfully realized as part of the Smart City lead project **iEnergy 2.0**. The plus energy house uses the operational waste heat of the research laboratories (energy index 12 kWh/m²a) and generates enough electricity for the electrical self-sufficiency of the building services via a 30 kWp photovoltaic system. The system was installed by the regional energy supplier Energie Steiermark GmbH as a green electricity plant by means of plant contracting. Currently buildings with a photovoltaic system have hardly any stationary electricity storages and offer even less cross-building photovoltaic electricity. In order to continue using photovoltaic electricity economically, low green electricity tariffs require not only a high use of own electricity, but also the possibility to offer the energy-surplus directly to other customers or to feed it into a daily storage. This multiple utilization system for photovoltaic electricity with maximum own electricity utilization will be realized within the framework of the **WEIZconnected** project with the buildings W.E.I.Z. 2 and W.E.I.Z. 4. The technical, economic and legal (ElWOG) system solution will be demonstrated as a pilot plant at the W.E.I.Z. Innovation Centre. W.E.I.Z. also deals with issues relating to energy management systems. In the various implementation and research projects, several energy monitoring systems have been developed and/or implemented in order that the consumption and production of energy can be monitored. Knowing how much energy is needed is important for the Weiz site. Therefore, a **smart meter system** for the power consumption of the W.E.I.Z. 4 was installed to make it visible.

Another example is the **MULTI-transfer** project, in which innovative control and operating strategies for a bidirectional heat transfer station were developed. Because of the decentralization of the heat production in district heating grids, more and more consumers want to act as prosumers and feed their surplus heat into the district heating grid. Up to now, two transfer stations have always been required for such cases, one for the heat consumption and one for the heat supply. In this project, a bidirectional heat transfer station was developed, which can be transferred heat in both directions. The functionality of the innovative heat transfer station could be reviewed by laboratory tests and simulation studies.

Second topic: Pilot specific technical/legal framework conditions

international:

- Short explanation of the targets of your underlying energy concept/plan. Have the various stakeholders agreed on these objectives?

The parish church of Weizberg, which is under monumental protection, is connected to a district heating grid with a heating load of about 220 kW. The heating station with its four separate transformer stations is located close to the church as shown in Figure 1. Only regional biomass is used as fuel. In course of the project Store4HUC, a storage, new regulations, heat exchanger, thermostatic valves and a monitoring system will be installed.

Figure 1. Location of the heating station where the storage will be installed

Furthermore, the comfort in the individual rooms should be increased. Through the installation of a building management system, visualisations and the continuous recording of measured values, the plants should be able to be optimized in retrospect by evaluating this "historical data". Moreover, the reduction of the return temperature to the biomass district heating is also a target, and if it is possible a new thermal storage with a volume of about 38 m^3 will be installed. In Figure 2 a schema of the implementation of the planned storage is shown.

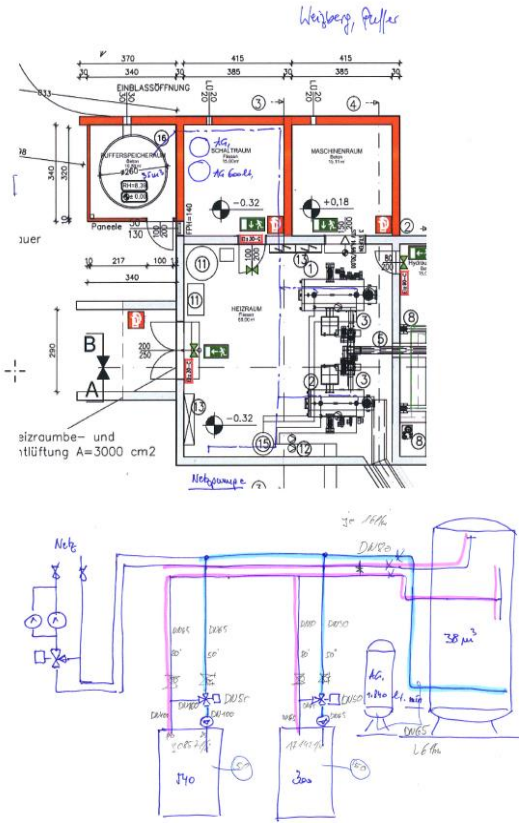


Figure 2: Scheme of the district heating station

The biomass heating plant Weizberg has been operated by 24 innovative farmers for 20 years (founded in 1999). Through the use of regional wood chips, the added value remains in the region. The heating plant supplies a total of twelve objects on the hill of Weizberg, including the elementary school as well as some commercial enterprises and residential buildings. Using renewable energy, the guiding principle of the farmer cooperative "Energy from the region for the region" is completely fulfilled in regard to the following rough figures:

- Heat consumption: Max. 812 kW / 1.200 MWh/a
- Wood chips consumption: About 1.500 loose cubic metre per year (100 % wood chips from regional farmers)
- Heat plant: 300 kW and 540 kW biomass boilers with rotation combustion

The stakeholders have agreed on these objectives.

- If not, what are their points?

  -

- Are there any critical issues regarding to the cultural heritage protection?

As already mentioned, there are numerous local, regional and national laws that must be observed with regard to cultural heritage protection in Austria. Structural measures are not allowed to lead to changes in the landscape. This is why the following points are relevant with regard to cultural heritage protection and hence buildings have to implemented as follows:

(1) Mostly implementation below terrain and surface level,

(2) utilization of existing buildings to cover the extension and associated restrictions regarding the dimensions of the new building,

(3) specially adapted design of the visible facades with regard to colour and geometry while complying with the requirements for weather resistance,

(4) minimally invasive integration, in order not to influence existing natural conditions such as trees and bushes.

- What are good KPIs for the pilot plant?

  KPI 1: Profitability i PI= NPV/I (Net Present Value (NPV) includes factors such as inflation, interest, equity and borrowed capital and all relevant costs that are associated with the investment over its overall lifetime (e.g. O&M costs, capital-related costs, reinvestments, etc.), and energy savings, which take into account the timing components of such savings.

  KPI 2: Reduction in Energy delivered per capita (comparative analysis of the status before and after realisation).

  KPI 3: Average yearly Emission abatement (with respect to the same reference value e.g. 2010 over the application life cycle)

  KPI4: Autarky rate in days (enhances the energy self-sufficiency of HUC).

  KPI 5: Stimulation of the local economy (New added value brought to the local economy and consequently potential number new business and trainings and jobs created (net)).

In particularly with regard to KPI 3 and the fact that the existing parts of the pilot plant are a CO_2 neural biomass heating plant operating with 100 % renewables, basically no CO_2 savings are possible, but under the assumptions of Table 1 it can be shown that CO_2 savings and savings of other emissions are possible through the integration of a storage.

Essentially, due to the planned measures of load balancing and peak load coverage, the disadvantageous partial/weak load operation of the boiler plant is avoided or reduced and thus the following positive effects are achieved:

- Increasing the efficiency of the fuel boilers → Savings in primary energy (fuel savings) → CO_2 savings through lower energy expenditure for the provision of the wood chips (production, transport, etc.)
- Lower pollutant emissions (carbon monoxide (CO), dust, NOx and volatile organic carbon compounds (CnHm))
- Increasing the service life of the plant components → Significant saving of ecological resources that would result from early complete renewal of the boiler plant.
- Increase in sweeping intervals (due to on/off operation of the boiler system, more time windows are available → Increase in efficiency, reduction in pollutant emissions
- Extension of maintenance intervals → Lower maintenance costs
- More dynamic operation of the local heating network possible → Consumers can be served more quickly with the required flow temperature
- In addition, the use of the heating network as a thermal buffer is avoided as a result of the central storage in the heating plant and the associated increased heat losses are reduced.

- Table 1: Calculated fuel and pollutant savings

		Before	After
Amount of fuel	[MWh]	1.781,76	1.688,19
Savings	[MWh]	93,56	
	[%]	5,25	
Amount of fuel	[srm]	1.869,10	1.770,95
Savings	[srm]	98,15	
	[%]	5,25	
Reduction of CO_2 equivalent emissions[1]	[t/a]	1,50	
Reduction of pollutants[2]			
- **CO**	[kg/a]	294,89	
- **NO_x**	[kg/a]	43,28	
- **Staub**	[kg/a]	27,28	
- **C_nH_m**	[kg/a]	59,62	
Theoretical CO_2-Reduction[3]	[t/a]	29,10	

national:

- What is the opinion of the stakeholders about the chosen storage solution?

All of the biomass members are satisfied with this solution. As there had already been discussions with most of the stakeholders before the official project kick off, it was already largely possible to agree on the present approach.

- Would a latent heat storage also be an option (comparison with Lendava)?

We discussed about storages in general and about different types of storages:

Heat storage are storage for thermal energy (energy storage). A distinction is made between storage for sensible heat, latent heat storage and thermochemical heat storage. Heat storage can be built in different sizes, ranging from decentralized small systems to large central storage. They are available both as short-term as well as seasonal storage and can depending on the design and absorb low-temperature heat for space heating or high-temperature heat for industrial applications. In addition to the storage of thermal energy is the most important goal of heat storage is to decouple the generation and use of heat in time.

[1] Saved emission for the provision of the wood chips (production, transport, etc.); calculation basis: CO2-equivalent emission factor=16 g/kWhEE(Bst.); mean value of the emission factors from [1], [2] and [1], after the emission factors from the literature show very high ranges of fluctuation.

[2] Saved emissions due to fuel savings; calculation basis: CO=3.15 g/kWhEE(Bst.), NOx=0.46 g/kWhEE(Bst.), dust=0.29 g/kWhEE(Bst.), CnHm=0.64 g/kWhEE(Bst.); mean values of the emission factors for Austria and Germany from [1].

[3] Is the CO2 saving which would result from the lower fuel consumption if the saved fuel were evaluated with the CO2-equivalent emission factor of heating oil, with the assumption that the peak load coverage of the heating plant could not be provided by a storage tank but by an oil boiler or that the saved biomass of this heating plant could substitute the fuel of another fossil-fired heating plant. Calculation basis: CO2-equivalent emission factor=311 g/kWhEE(Bst.) from [2].

Types of heat storage

1. Sensible heat storage

They change during charging or discharging their "tactile" temperature, e.g. Buffers. The heat capacity is the most important parameter for sensitive storage materials. Since this type does not undergo phase transitions, it can be used over a wide temperature range, especially in the high temperature range.

2. Latent heat storage

They do not change their "sensible" temperature when charging or discharging, but the heat storage medium changes its state of aggregation. This is usually the transition from solid to liquid (or vice versa). The storage medium can be loaded or unloaded beyond its latent heat capacity, which only leads to an increase or decrease in temperature.

3. Thermochemical heat storage or sorption storage

They store the heat with the help of endo- and exothermic reactions, e.g. As with silica gel or zeolites.

In addition, it is still possible to distinguish between open, built into the ground so-called aquifer storage and the usual container designs

We had a lot of discussions with the planning company regarding to the best storage solution and came to the result that a latent heat storage would be to expensive in our case. The final decision, that it will be a thermal water storage was made by the owner of the biomass heating network and the planning company.

- **Third topic: Pilot specific social/political aspects**

  international

- Who are the main actors and how are they connected?

The following tables shows the time-wise stakeholder cooperation, and the tasks for each of them. The identified stakeholders have been summarized in groups with similar activities. The tables (Table 2 to Table 7) will be used as living document for the future deployment desks, which means that they will be updated during the project time. As far as they are already known the planned activities are listed.

Table 2: Stakeholder 1: WEIZ (employees of WEIZ)

Actions	
1.	Establish of feasibility study
2.	Organization of deployment desk meetings
3.	Lead the implementation process, local support
4	Support within the implementation of actions

Table 3: Stakeholder 2: 4ward Energy (employees of 4ward Energy)

Actions	
1	evaluate self-sustainability of different pilot options in the pilot preparatory phase – together with WEIZ
2	providing other consulting services – support of WEIZ

Table 4: Stakeholder 3: Technicians (Gerald Hutter, Varicon Günther Grabner (Iplan))

Actions	
1.	technical organization in terms of energy management; regularly
2.	checking with WEIZ and the regional actors the installations progress and perform final verification
3	Approve the planned investments within the project after the planning phase is finished

Table 5: Stakeholder 4: local authorities in reach of WEIZ, cities and municipalities representatives from Weiz, Thannhausen and Almenland

Actions	
1.	knowledge transfer of the pilot to make it relevant also for other sites

Table 6: Stakeholder 5 members of the biomass network

Actions	
1.	knowledge transfer of the pilot to make it relevant also for other sites
2.	Investor of the measures and the storage

Table 7: Stakeholder 6 researcher and biomass experts (AEE INTEC)

Actions	
1.	Feasibility study
2.	Pre investment concept
3.	providing other consulting services based on experience from investments in historical urban centers

Technicians of technical offices (Günter Grabner, Gerald Hutter, and Johann Haas) are regional experts in planning of biomass storages, EMS Systems and energy efficiency measurements. They will gain extra knowledge, and experiences in implementation of renewable energy systems and storages in the envisaged historical urban area.

Other Styrian cities and municipalities will be educated about the benefits of energy efficiency and the use of renewable energy sources as well as on storages in buildings under cultural heritage protection. The pilot will provide a good showcase to the local authorities which will also benefit in sense of improved energy efficiency, increased usage of renewable energy sources and lower costs for energy.

The members of the biomass district heating systems will be educated how to enable further development of projects dedicated to renewable energy sources on other cultural heritage buildings and will gain knowledge about possible technologies of district heating networks.

- How effectively policy development and implementation is integrating relevant economic, social, energy and environmental aspects?

As the Store4HUC project shows, the integration of relevant economic, social, energy and environmental aspects is very effective. The integration of these aspects should therefore play an important role in building projects of all sizes.

- What will be the benefits for the citizens, respective end-users / for the municipality / for the surrounding neighbourhood?

The main advantages of the new water storage system are that it will save resources and costs. In addition, the district heating boilers can be partially switched off.

Citizens play a minor role in the project implementation. Connected to the district heating system and the new water storage system is mainly the parish buildings, the church, the elementary school and a restaurant with hotel.

- How evident are they for your municipality?

They are very evident for this historical urban city district, which is difficult to access by the large district heating system of the city.

- How may the project Store4HUC influence your municipal policy strategy?

A successful implementation may result in the expansion of this small-scale district heating network with storage facility to other historic urban city districts. However, there are larger potentials for other cities with similar conditions (parish/church with hotel & restaurant and a school).

- What are the targets for your stakeholders for participating in the deployment desk (self-assessment)?

Due to the meetings, which take place about once every six months, the interest groups should follow the course of the project and be constantly updated. The meetings will include a summary of problems and their causes. By sharing the gained knowledge in a meeting, discussions about the implementation process can be raised, which contributes to an informed solution-finding.

National

- Are there any special social aspects to consider because the pilot will be a church?

No, not directly. The same requirements apply as for all historical buildings and listed buildings.

- How is the project seen within the church?

The church (the whole parish) is also interested in energy efficiency and in saving energy, as well are the interested in reduce the backflow temperature, so the solutions with enlarge the energy efficiency with several measures and to implement a heat exchanger, was a good solution for the parish and they are willing to support and finance the project

5. Implemented actions and links to deliverables, outputs

The W.E.I.Z. has set up the local deployment desk as part of its project work until now. In this context, various interest groups (local decision makers, members of the community, members of the biomass district heating network, sectoral authorities, energy experts, etc.) were involved in the process of controlling and planning energy storage. In this context, two deployment desk meetings were held. The launch of the deployment desk Meeting on 14 June 2019 and a second meeting on 11 September 2019 were used to discuss the feasibility study.

In the context of communication activities, the W.E.I.Z. provided inputs regarding D C.1.1 - the common communication strategy. The W.E.I.Z. also purchased a project rollup. A solar power bank will also be purchased by W.E.I.Z..

The most important (transnational) meetings, besides the project meetings in Slovenia and Italy, was the participation cross fertilization WS of Climate alliance in Rostock and the participation on 12th of September in a national event with the focus on "Energy-infrastructure". On the 29th of August a workshop on energy was organised by Weiz and the Project "Store4HUC" was presented there. A regional Meeting took place on the 2nd of July with the Government of Styria in Weiz were we presented solutions concerning climate adaption. The Store4HUC project is also on the W.E.I.Z. website and an article was written for regional newspaper.

6. Results, effects and the response

By the objective, innovative approach and despite additional expenditure it is possible to insert the existing biomass heating plant as well as the planned water buffer inconspicuously into the overall view. This can show that large thermal energy storage systems will be a technically and economically sensible option for providing heat and cooling in the future, even in buildings or districts protected by local and historical monuments, especially with regard to the integration of renewable energy sources. The result is that, following the Weizer model, the integration of a biomass local heating plant including thermal storage can be made possible at numerous locations in districts protected by local and historical monuments and therefore in Weizer districts by means of an integrated construction method for the plant. The number of cities with historical city centres in Austria is currently 44. In addition, 26 monuments are under protection in Weiz and 38 367 in Austria.

Considering these figures, there is broad agreement among the stakeholders to continue along the chosen path. However, the main critical points are the integration into the landscape and the resulting additional costs, which are necessary due to the additional planning. Since the pilot plant is not supported by investment subsidies from Store4HUC, external subsidies for the planned plant are an important goal of the stakeholders and will be investigated further. The stakeholders were particularly surprised by the fact that the innovative approach not only makes implementation possible, but also that it is possible to save almost 20 % of CO_2 emissions due to optimised boiler operation. It is also essential for the stakeholders and the implementation that the boilers can be used for a longer period of time due to optimised operation and thus costs can be saved.

7. Conclusion

At the end of the meetings the participating stakeholders were asked for a short feedback. Both meetings have been considered useful. The first one was a good start in the project, by explaining the concept of the deployment desk and providing an overview of the idea of the pilot. In the second meeting more detailed questions regarding to the technical, legal and social framework conditions of the pilot have been discussed. The external as well as the internal stakeholders have benefited from these discussions.

8. Annexes

8.1. Invitation and Agenda

19:00: „get together“

19:15: Welcoming speech (Johannes Schinagl, Managing director of Biomass district heating Weizberg)

19:30 Presentation of the procedure, backgrounds and targets of the deployment desk (Andrea Dornhofer)

20:00: Short presentation of the project Weizberg (Johann Neuhold – Chairmen of Biomass district heating Weizberg)

20:30 Questions about the project

Dieses Projektes „Store4HUC“ wird durch Mittel des transnationalen Interreg CENTRAL EUROPE Programmes zur nachhaltigen Entwicklung und Umsetzung von Energiestrategien und -maßnahmen in zentraleuropäischen Städten und Regionen gefördert!

AGENDA

Workshop: KICK OFF MEETING “Deployment Desk” STORE 4 HUC (Österreich)

Ort, Datum: Weiz, 14. Juni 2019, 19:00

1) Begrüßung:

Andrea Dornhofer, (Weizer Energie- Innovations- Zentrum), Johann Neuhold (Biomasse Weizberg)

2) Kurzvorstellung Projekt Store4HUC

Andrea Dornhofer (Weizer- Energie- Innovations- Zentrum)

3) Vorstellung Deploymentdesk Store4HUC

Andrea Dornhofer (Weizer Energie- Innovations- Zentrum)

8.2. List of participants

Dieses Projektes „Store4HUC“ wird durch Mittel des transnationalen Interreg CENTRAL EUROPE Programmes zur nachhaltigen Entwicklung und Umsetzung von Energiestrategien und -maßnahmen in zentraleuropäischen Städten und Regionen gefördert!

Workshop: Kick off Deployment Desk

Ort, Datum: Weiz, 14. Juni 19:00-21:00 Uhr

[redacted]

By signing, you agree that your personal data may also be used for the purposes of the narrative and financial control of the provider of funds and other public authorities to control the use of public funds. Your data are protected by public authorities in accordance with the European and Austrian regulations. The consent is required by the General Data Protection Regulation. If you do not want to share your personal information, enter only the name and surname and your signature.

[redacted]

Seite 2

Interreg CENTRAL EUROPE STORE4HUC Das Land Steiermark Regionen Innovationszentrum W.E.I.Z.

Dieses Projektes „Store4HUC“ wird durch Mittel des transnationalen Interreg CENTRAL EUROPE Programmes zur nachhaltigen Entwicklung und Umsetzung von Energiestrategien und -maßnahmen in zentraleuropäischen Städten und Regionen gefördert!

Workshop: Deployment Desk meeting 2nd meeting

Ort, Datum: EDERER, WEIZBERG 2, 11.09.2019, 08:00 – 10:00

[redacted]

By signing, you agree that your personal data may also be used for the purposes of the narrative and financial control of the provider of funds and other public authorities to control the use of public funds. Your data are protected by public authorities in accordance with the European and Austrian regulations. The consent is required by the General Data Protection Regulation. If you do not want to share your personal information, enter only the name and surname and your signature.

Interreg CENTRAL EUROPE STORE4HUC Das Land Steiermark Regionen Innovationszentrum W.E.I.Z.

[redacted]

Seite 2

8.3. Pictures

8.4. Web-links

- http://www.innovationszentrum-weiz.at/
- http://weizberg.heimat.eu/Index.htm

A. References

[1] Arbeitsgemeinschaft QM Holzheizwerke, Qualitäts-Management Holzheizwerke - Planungshandbuch, (2008).

[2] Österreichisches Institut für Bautechnik, OIB Richtlinie 6 - Energieeinsparung und Wärmeschutz OIB-330.6-009/15, (2015). https://www.oib.or.at/sites/default/files/richtlinie_6_26.03.15.pdf (accessed May 28, 2018).

[3] ÖNORM EN ISO 52000-1, Energieeffizienz von Gebäuden - Festlegungen zur Bewertung der Energieeffizienz von Gebäuden - Teil 1: Allgemeiner Rahmen und Verfahren, Wien, 2018.

DOCUMENTATION ON DECISIONS OF 1ST „DEPLOYMENT DESK" MEETING

ITALY

D.T1.1.2

Version: final

25.09.2019

Title	Documentation on decisions of 1st “Deployment Desk” Meeting in Italy
Deliverable	D.T1.1.2
Authors	Stefano Dotta
Contributors	
Status	final
Reviewed by	Luca Galeasso
Submission	25/09/2019

Content

1. Summary

The first Deployment desk was carried out within the timeframe set by the project at the City of Cuneo, with the participation of numerous stakeholders from the province of Cuneo and the Piedmont Region.

It was not possible to involve national stakeholders operating in the field of management of electricity grid (e-distribuzione, ARERA) and the national company that manage the incentive mechanisms aimed at promoting electricity generated from renewable energy and energy efficiency (GSE), which will be involved from the second deployment desk.

On the basis of the topics discussed, many ideas and suggestions emerged both for the development of the Pilot and more generally on the opportunities for development and dissemination of energy storage in urban areas.

Important and significant relations between energy storage technologies and the development of municipal policies on energy and environment.

The deployment desk has given the opportunity to create a better connection between the different sectors of Municipality of Cuneo in the definition of the energy and environment policy. Many results of the discussion will be useful for the develop of the SECAP that will be finalized at the beginning of the next year

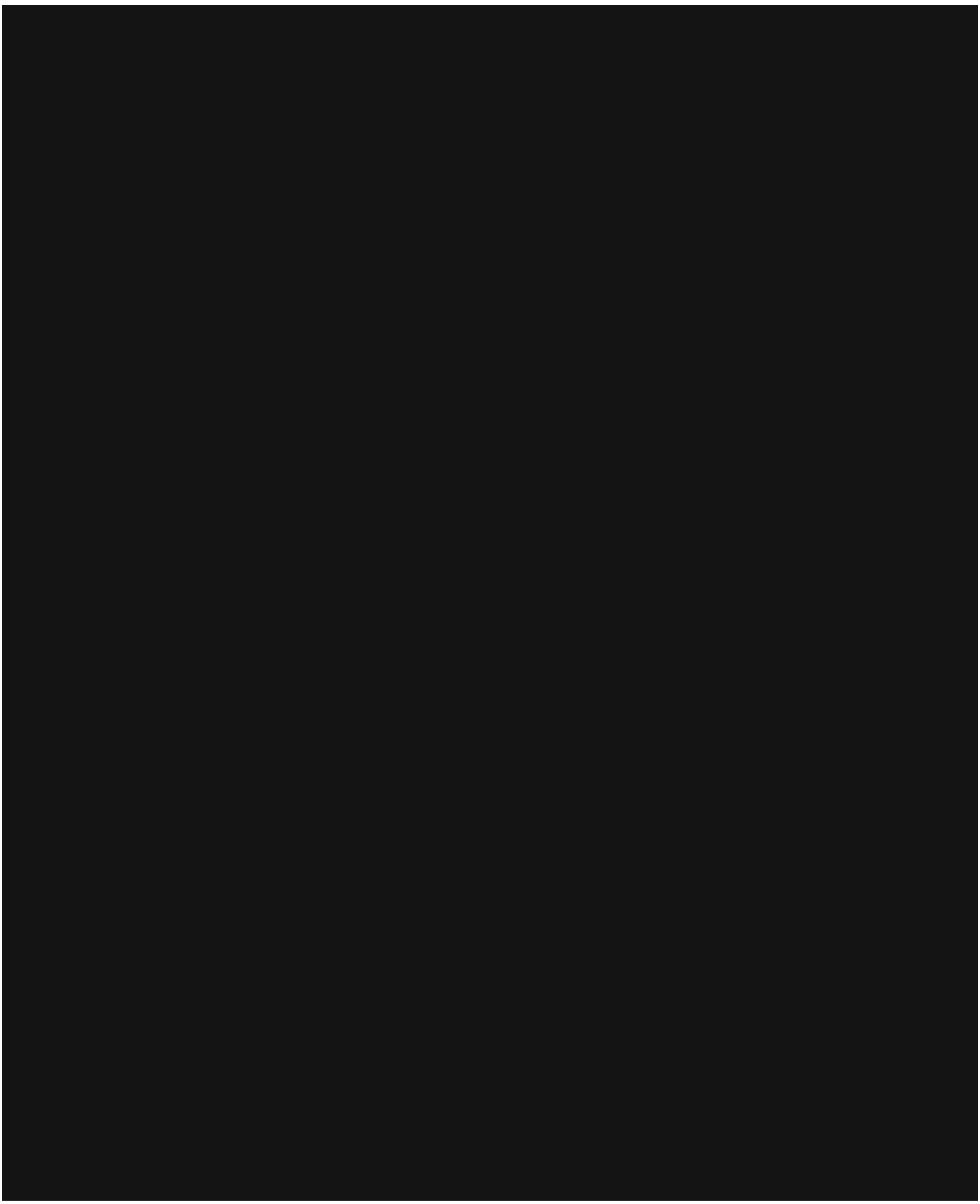
During the first deployment desk the stakeholder had also discussed on the opportunities to create energy communities on Piedmont Region and about the improvement of the smartness level in the municipality of Cuneo. Important and significant relations between energy storage and the development of municipal policies for the creation of energy communities and smart cities have also emerged.

2. Date and place

The first Italian deployment desk took place on 12 September 2019 in Cuneo at the Casa del Fiume in Via Porta di Mondovì 11A from 2.30pm to 5.00pm, before the deployment desk began, the kick-off event for the pilot was held in the same place.

3. Number and types of participants/target groups

The participants at the first Italian deployment desk are reported in the list below, the participants were 24, for each of them are indicate the name of the Organization/Public Authority/Private Company the types and the name of the participants person and signed participant list; For Italy this groups are:



4. Topics tackled

- The main topics discussed during the first deployment desk were three, and they concerned the opportunities, the constraints in the installation of energy storage in historic urban centres, as well as the contribution that energy storage technologies can make to the energy and environmental planning of municipalities in order to achieve the goals by 2030.
- All the topics discussed were contextualized in the reality of the Municipality of Cuneo, however the results and suggestions that emerged could be similar to those of Municipalities settled in other regions or countries
- These questions, which were divided in 3 main topics, were based on the information from DT 1.1.1. These topics were discussed one after another in two different working groups with 10 participants and two moderators, provided by the partners, for each.

4.1. Questions

First topic: The Energy Storage in Historic Centres: What opportunities?

- What are the needs for the installation of energy storage in historical centres?

  At the regional level there aren't specific need on technological aspect, actually technologies and expertise are on the market in the specific case of HUC the energy storage could be a big opportunity for storage energy produced out to HUC. Actually the needs are on regulatory field.

- What are the opportunities for the installation of energy storage in historical centres?

  In the specific case of HUC the energy storage could be a big opportunity for storage energy produced out to HUC. Many constraints concerning the protection of architectural and environmental heritage that prevent the installation of RES and Energy Storage in historic centres could be overcome by the installation of energy storage. The RES could be produced out of HUC and directly used in the HUC thanks to the energy storage.

- What incentives are available for the installation of energy storage? What forms of incentives could be adopted if they do not yet exist?

  Actually, in Italy are available specific incentives at the regional level, but not in all the Italian regions. Only in Veneto and Lombardia the private owners have the opportunity to require incentives for the installation of energy storage connected with installation of RES.

- What experiences or best practices do you know?

  Some good experience or best practice are known but many of them were developed thanks to pilot project or research project.

- Energy communities and historical centres, needs and opportunities

  The implementation of energy communities is considered like a big opportunity in order to improve the use of energy storage.

- RES - Energy storage - sustainable mobility: what interactions and opportunities for the implementation of energy communities in urban areas?

  The public and private urban transport are responsible of a huge amount of CO2 emissions energy consumption and air pollution, In the next years many old and inefficiency vehicles should be substitute with new electric, for these reasons a lot of recharge grid will be implemented in HUC. Recharge station will be connected with energy storage and RES in a new electric grid paradigm.

- Specific considerations about the Pilot, e.g.: The new energy storage and RES system that will be implemented in the sloping elevator could be integrated with a new urban mobility system and become an intermobility node (cars and electric bicycles).

  Yes, the idea is to produce more energy that the elevator consumes during the day thank to the implementation of a PV plant a new energy recovery system and a new energy storage, for these reasons the pilot must be strictly connected with a electric recharge system for cars and bicycles.

Second Topic: The Energy Storage in Historic Centres: What constraints?

- Are there barriers and regulatory constraints concerning the protection of architectural and environmental heritage that prevent the installation of RES and Energy Storage in historic centres?

  Actually, there aren't barriers and regulatory constrain concerning protection of architectural and environmental heritage that prevent the installation of Energy Storage in HUC but new regulation and low at national level must to be developed on the field of energy trading. The lack of regulation on energy marked based on energy decentralization and peer to peer energy trading prevents the spread of energy storage

- Is it easy to get the permits for PV installations in HUCs in Italy?

  It is quite easy if the building isn't protected by regulatory constraints, if is protected no PV plant could be installed

- Could innovative integrated photovoltaic systems help to overcome constraints and safeguard the historical/architectural heritage in historic centres?

  Innovative integrate photovoltaic system could help to overcome constraints but must evaluate case by case and depending by the overall architectural design

- Storage and sale of electricity produced by RES? Is it possible? For what uses? What authorizations?

  The lack of laws that can regulate the sale of energy produced by photovoltaic systems is the main barrier that limits the spread of energy Storage

- Specific considerations about the Pilot

  A regulatory barrier concerning the protection of natural heritage join with the lack of regulation on energy marked based on energy decentralization and peer to peer energy trading could limits the installation of PV plant foreseen by the project.

Third topic: Storage systems and energy/environmental planning towards the 2030 targets

- Who are the main actors and how are they connected?

  The main stakeholder involved on energy and environmental planning towards the 2030 targets are the different sector of Public Authority at different level (municipality, province, region)

- What opportunities does a municipality have to integrate economic, social, energy and environmental aspects into its policies?

  SEAP and SECAP are the principal opportunities to integrate energy and environmental aspect in a single municipal plan, but this document is effective only if integrated with the other planning and regulatory tools of the Municipality. In order to obtain social and economic benefits, greater interactions between the various sectors of the municipal administration are hoped for.

- What will be the benefits for the citizens, respective end-users / for the municipality / for the surrounding neighbourhood?

Public service more efficiency, sustainable and economic are benefits for the citizens. The use of energy storage connected with RES (also private) in order to provide energy for public service like public electric transport, green transport or public building could be a great benefit for all the citizens.

- How can the installation of RES and energy storage in historical centres be integrated and linked to municipal energy planning tools (e.g. CFSP, building regulations etc.)?

  The main regulatory barrier depending on national low concerning the protection of architectural historic heritage, the municipality can support the installation of RES and energy storage where it is possible with its regulation in terms of tax reduction or new building volumes.

- What do you think about the potential replicability on the regional territory of projects integrating accumulation and RES in historical centres?

  The Cuneo Pilot project could be replicate on the same municipality thanks to the new sustainable urban mobility plan that foreseen the implementation of new elevators that will connect the HUC with intermodal parking. Also, in the Province of Cuneo other municipality have similar public mobility system where is possible implement the same technology and solutions.

- Specific considerations about the Pilot

  The pilot is one of the measure of intervention foreseen by the SECAP

5. Implemented actions and links to deliverables, outputs

- All stakeholders were involved in the deployment desk initially through direct contacts (phone calls) and then through official invitations if necessary.

  Before the start of the deployment desk, all participants were given a description of the project's objectives and actions. In the next few days, a report will be sent with the topics covered and the results obtained from the first deployment desk.

  During the first deployment desk a rollup of the project was exposed.

6. Results, effects and the response

At the end of the first deployment desk the two working group leaders presented the results of the discussion at the participants, after that a short discussion on the result was carried out.

The first deployment desk has given to the partners same good suggestions for carrying out the next actions foreseen by the project, in particular for the implementation of the Pilot but also for the development of the municipal plans for energy and climate.

About the constrains the result of the discussion was:

- new regulation and low at national level must to be developed on the field of energy trading. The lack of regulation on energy marked based on energy decentralization and peer to peer energy trading prevents the spread of energy storage
- the rules for the protection of historical centres can be considered as barriers to the installation of renewable energy equipment but not to the spread of energy storage, on the contrary, these constraints could prove to be an opportunity for the energy storage technology

About the opportunities:

- The diffusion of energy storage in historical centres could be an opportunity to improve some of the services like the urban public transport and consequently the environmental quality of cities (air quality)
- This technology could help to overcame the historical and architectural constraints in HUC
- This technology give the opportunity to develop the energy communities in urban area
- This technology can enable energy decentralisation and increase energy production from renewable sources and achieve complete decarbonisation.
- A strong boost to the installation of energy storage could be given by new incentive policies implemented at regional and national level

About the energy and environmental planning towards the 2030 targets

- The first deployment desk was useful to the Municipality of Cuneo in order to understand that is necessary develop integrate planning involving the different sectors and plan (SECAP, municipal building regulations, urban master plan, urban plan for sustainable mobility etc)
- Municipal energy planning is transversal and the diffusion of energy storage can help in the development and implementation of different municipal strategies and policies.

7. Conclusion

- At the end of the meeting, a brief feedback was collected from the participants, who considered it useful to participate in the first deployment desk.

8. Annexes

8.1. Invitation and Agenda

The final agenda was:

- Kick-off event - open

  14:20: „get together“

  14:30: Welcoming speech (Davide Dalmasso - Councilor for the Environment and Mobility of the Municipality of Cuneo Avv., Luca Gautero - Director of the Public Works and Environment Sector of the Municipality of Cuneo)

  14:35: Short presentation of the project (Luca Galeasso – Environment Park)

  14:50: Visit to the sloping elevator

- Deployment Desk – stakeholders only

  15:10: Presentation of the Deployment Desk to the participants (targets and topics) (Stefano Dotta – Environment Park)

  15:15: description of procedure, division of participants in two work groups, short introduction of moderators (Stefano Dotta and Luca Galeasso Environment Park)

  15:20: First working group round

  15:45: Second working group round

  16:10: Third working group round

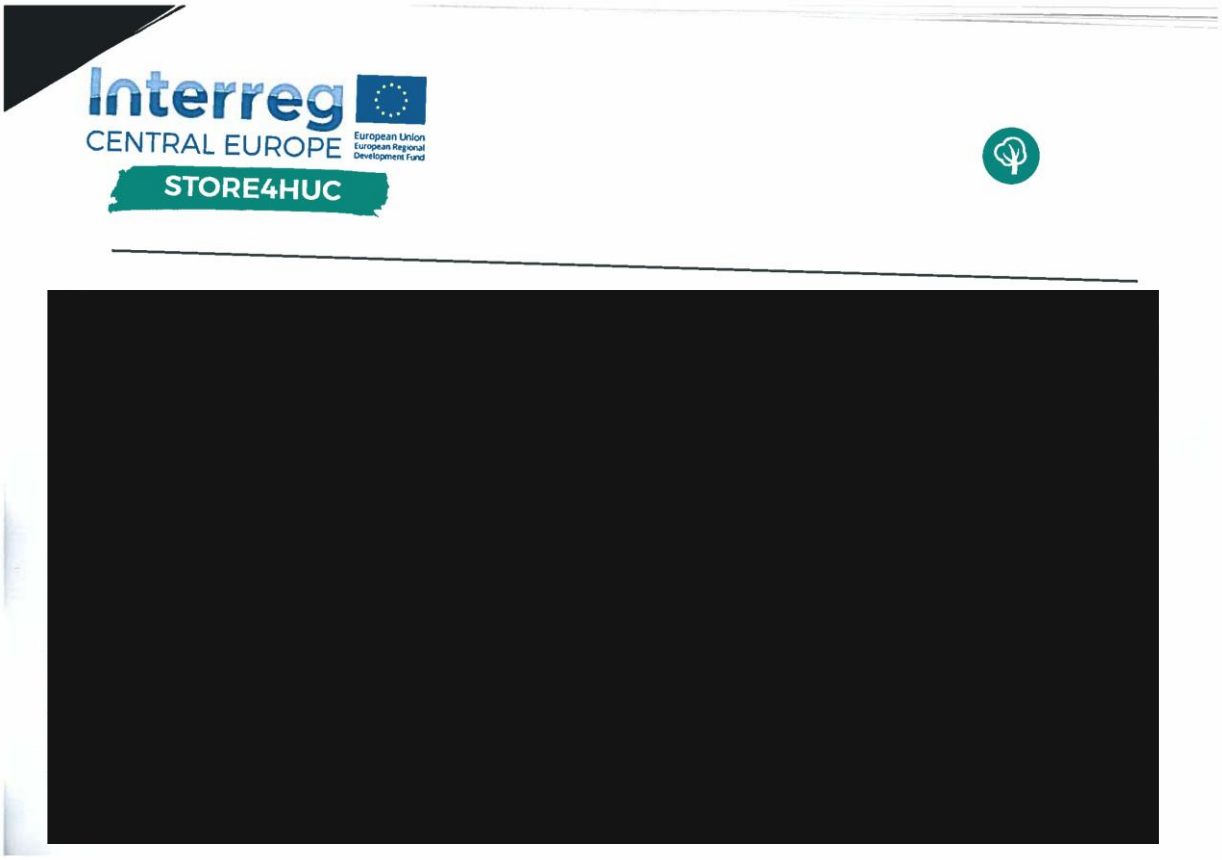
  16:35: Presentation of the results (working group leaders)

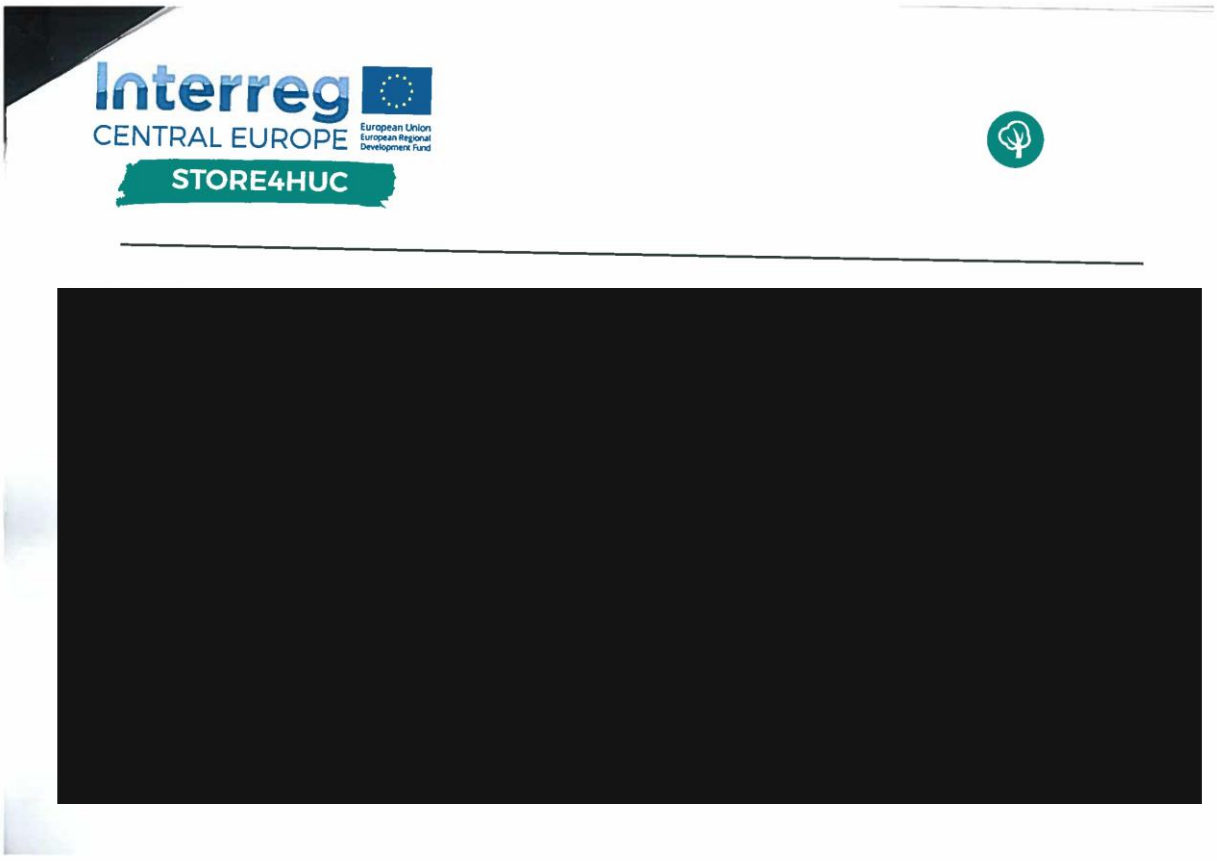
  16:50: Discussion on the results (Beppe Gamba – Environment Park)

  17:00: Expression of thanks and outlook on the next steps

8.2. List of participants

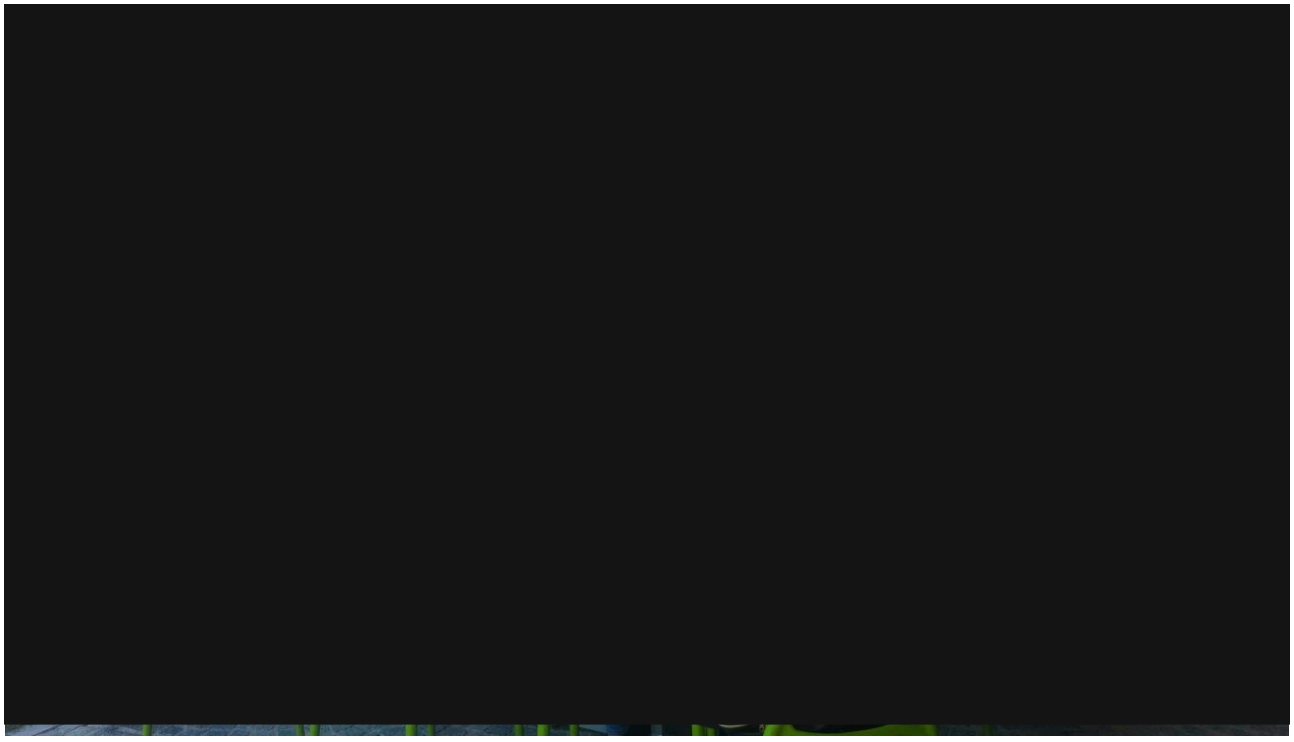
LIST OF PARTICIPANTS: D. T1.1.2 1st Deployment Desk meeting, Cuneo, 12.09.2019





8.3. Pictures

La Casa del Fiume



First Deploment Desk (1°working group)

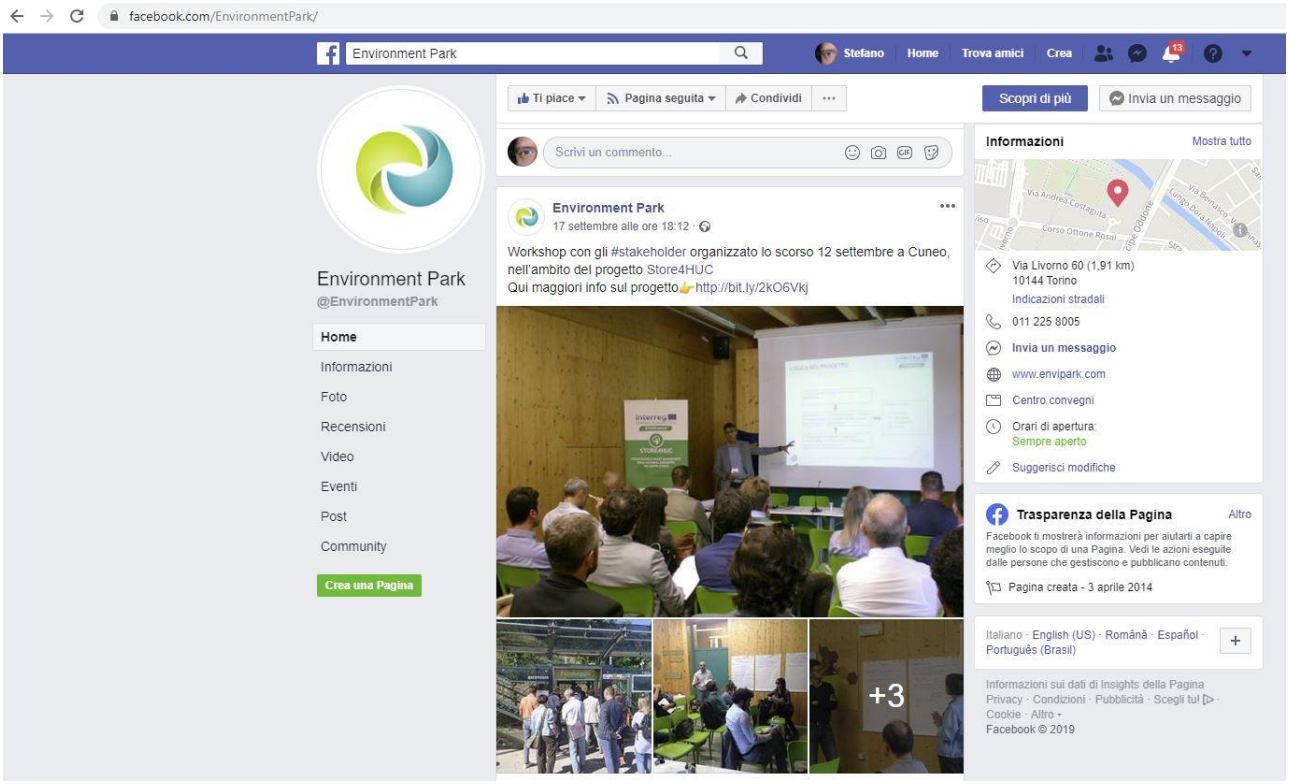
- First Deplomento Desk (2° working group)

-
- Luca Galeasso during the presentation of the project

-

- The leader of first working group presents the results

8.4. Media coverage



- Environment Park facebook page

8.5. Web-links

http://www.targatocn.it/2019/09/17/leggi-notizia/argomenti/attualita/articolo/cuneo-avviati-i-lavori-del-progetto-central-europe-store4huc.html

https://www.cuneodice.it/varie/cuneo-e-valli/progetto-central-europe-store4huc-avviati-i-lavori-del-tavolo-degli-stakeholder_29365.html

DOCUMENTATION ON DECISIONS OF 1ST „DEPLOYMENT DESK" MEETING

GERMANY

D.T1.1.2

Version: final

09.2019

Title	Documentation on decisions of 1st “Deployment Desk” Meeting in Germany
Deliverable	D.T1.1.2
Authors	Wolfgang Hofstetter, Alois Kraußler, Robert Pratter
Contributors	
Status	final
Reviewed by	
Submission	

Content

1. Summary

During summer 2019 several cities and institutions have been contacted. Three of them delivered written answers on the Store4HUC questions. The city of Heilbronn in the state of Baden-Württemberg which is part of the Central Europe area, a Bavarian city which is also located in the project area and the Energy Agency of the State of Northrhine-Westphalia, which lays outside the geographical Central Europe Area but whose stakeholder manages a nationwide network of churches. Their answers on the Store4HUC questions are shown in detail in this report.

Some other cities are interested in following the project, for example the city of Eschborn and the city of Würzburg. Finally proposals are made where possibly tool trainings and storage seminar could be provided in Germany.

2. Approach of the telephone survey

As there is no pilot city in Germany telephone and email contacts to different local authorities and institutions have been established instead of a physical meeting. The possible stakeholders have been approached due to the region in which they are situated – they should be in the regions covered by Interreg central Europe. Cities have been approached which have a long history and therefore should have monument protected buildings. Contacts have been activated to persons who deal with monument protected buildings or who have been active in this field in former years or which manage as multipliers networks where monument protected buildings are a topic.

An email was sent out explaining the persons the Store4HUC project based on the Store4HUC press release and indicating where additional information could be found like links to further information on the Store4HUC website, the news section of the Climate Alliance homepage and the Store4HUC project subpage of the Climate Alliance Homepage.

To get a written feedback on the Store4HUC questions it was necessary to keep close contacts by phone and email to the approached persons.

3. Number and types of participants/target groups

In Germany we got written feedback on the Store4HUC questions from 3 cities and institutions. We approached many more.

We got written answers from the energy management of a big Bavarian city. The person who supplied the feedback gives his own opinion, the name of the city has to be kept anonymous. If not it would be the official opinion of the city, a procedure which would have been much more complicated to go through and much more time consuming.

We received answers from the city of Heilbronn in Baden-Württemberg. The person involved works for the Stabsstelle City Development and questions for the future. The person engaged may be of special interest for the Store4HUC project because this stakeholder has a working experience in monument protection for many years.

This person tried to make a contact for Store4HUC with the Landesamt für Denkmalpflege Baden-Württemberg which is the upper monument protection authority of the state of Baden-Württemberg. This authority checked out the Store4HUC questions but finally rejected to contribute.

The third and last contribution we received from the Energy Agency of the State of Northrhine-Westphalia, department of energy application and climate protection in cities and regions. This contact is interesting for Store4HUC because the stakeholder is managing a network of 145 people and 29 dioceses and state churches of the roman catholic and the protestant church in Germany.

A personal meeting was arranged with the city of Eschborn, where the climate protection manager expressed his interest in following the Store4HUC results but has no knowledge about energy storage in monument protected buildings.

The situation is similar in the ancient city of Würzburg in Bavaria, where the stakeholder works in the field of energetic urban planning and reorganisation management which is part of the department of municipal energy management and building physics. The city wants to become active with monument protected buildings but runs not yet own projects. The stakeholder wants to observe the Store4HUC results. The city runs a local climate protection conference in October 2019 where monument protection is a topic in a panel discussion. For Store4HUC the contact was established too late to get a slot in this event.

In summer 2019 the manager of Quattropole was approached, which is a city network consisting of Luxembourg, the capital of Luxembourg, city of Metz, France and the german cities of Trier, with 2000 years of history, and Saarbrücken. The networks manager did spread the information into these cities but received no response.

Lately Nassauische Heimstätte was approached, a company which owns 59000 apartments in the Rhine Main Region to find out which energy storage projects they are running. The contact person did forward the Climate Alliance inquiry to other departments within the company but so far, we received no answer.

4. Topics tackled

The topics tackled have been developed and provided in cooperation with the Austrian partners. They are orientated on the other deployment desks. Despite of explaining the topics and questions by phone not all the approached stakeholder did understand all the questions. If we received written feedback in german language the answers have been translated by Climate Alliance into English language. The focus of the questions was put on the problems, needs and opportunities of EMS and energy storage planning in Germany. As monument protection is attached to the German states, not to the federal government, questions of the differences have been raised. The experience of the stakeholder was checked out, and it was tried to find out about the situation in Germany with getting permissions to install storages or PV systems in HUCs.

4.1. Questions and answers

What are the problems on EMS and energy storage planning in HUCs in Germany?

City of Heilbronn
Building measures on cultural monuments often stand in the area of conflict between the respective legal regulations for the protection of historical monuments as well as other design statutes and for the Climate and property protection.

Bavarian City
I don't see any connection between energy management systems and energy storage planning. Does it exist?

Energy Agency of the state of Northrhine-Westphalia
In Germany, storage facilities are part of the respective supply system. Whoever supplies a building, a neighbourhood or a region also takes care of the optimisation of the system, which may also include appropriate storage facilities. To optimize a system, an energy management system (EMS) can be implemented.

The design of the EMS and the dimensioning of the storage depend on the size of the supplied area. The following discussion is intended to clarify this. A distinction can be made between:
- Supply of individual objects (building owner = operator of the energy supply)
- Supply of neighbourhoods (many building owners are supplied by one energy supplier)
- Supply of regions (energy suppliers and many different end users)

As the current project focuses on energy storage systems in historic town and city centres, energy storage systems are likely to be of particular interest for individual and ensemble supply systems and local heating solutions.

The biggest problem in the planning of supply systems, including storage, is that often the requirements as a basis for the planning of the storage facilities are not known. This is the case, for example, if the energy supplier is not also the owner of the buildings to be supplied.

A further difficulty is planning security, as the obligation to connect and use (AuBZ) is highly controversial. If my knowledge is correct, then it is partly possible to establish an AuBZ for new housing estates, to what extent this is possible in the case of existing housing, is not known to me. However, I dare to make a question mark. However, this means that an investor - unless he receives reliable promises from potential

buyers in advance - will only know the actual requirements very roughly. A modular, expandable concept is recommended.

In all these fundamental considerations, the keyword HUC has not yet appeared. This is because the problems discussed so far are location-independent. In HUC, there are more problems with the structural integration of the storage facilities into the existing system. However, this question will be discussed later in the question on technical changes to monuments.

What are the needs on EMS and energy storage planning in HUCs in Germany?

City of Heilbronn
I can't give you any information about that.

Bavarian City
I can't give you any information about that. I do not see any connection between the energy management system and energy storage planning. Is there one?

Energy Agency of the state of Northrhine-Westphalia
There's only one definite requirement. Namely, that the listed building must remain intact. This refers both to the appearance of protected sites and to technical or structural changes to the monument itself. Otherwise the investor is free in the planning and technical conception.

What are the opportunities on EMS and energy storage planning in Germany?

City of Heilbronn
Certainly there are buildings in which an energy management system and an energy storage system make it possible to protect listed buildings and make sense for reasons of climate protection.
Historic old towns must be viewed in a differentiated way. Historic city centres, such as the Heidelberg's old town is protected as a whole according to § 19 DSchG BW. There are different legal regulations depending on the federal state and the degree of preservation of the city centres. Often not all buildings are listed, i.e. there is more room for manoeuvre for the interior of the buildings. However, changes to the external appearance of "non-cultural monuments" in historical areas are often subject to approval (e.g. through design statutes).

Bavarian City
I don't see any connection between energy management systems and energy storage planning. Does it exist?

Energy Agency of the state of Northrhine-Westphalia
The possibilities are manifold... I don't understand the question.

Are there any local differences? (Are the laws the same all over Germany, etc.?)

City of Heilbronn
In Germany the protection of historical monuments is in the sovereignty of the federal states, i.e. each federal state has its own law for the protection of historical monuments. As a result, there are different legal requirements for the restoration and modernisation of cultural monuments inside and outside historical monuments Areas.

Bavarian City
Basically, the laws regarding (electrical) energy storage are the same, but the law hands over the final responsibility for grid stability to the respective distribution system operator. The operator has some room to interpret the law. Therefore, a large electrical storage system with high power output may be allowed in one region but not allowed in another region, due to grid issues. Currently, there are more than 900 distribution system operators in Germany. Every electrical production unit and every electrical storage unit has to be registered with the distribution system operator. Large units also need a permission to operate before being connected to the grid.

Heat storage systems are usually not connected to any grid, therefore registration and approval is not necessary.

Energy Agency of the state of Northrhine-Westphalia
The legal framework conditions are basically very similar throughout Germany. The federal government defines the legal framework which the federal states formulate with the state building regulations. As far as I know, there are no legal requirements for the planning of storage facilities and EMS.
However, for planning and implementation there are the standards of the professional associations (DIN, VDI, DVGW etc.) which are regarded as recognized state of the art and which should be observed.

What experiences does the participant have with this topic?

City of Heilbronn
I myself worked for 10 years as a lower monument protection authority in Baden-Württemberg, before I took on a completely new task with climate protection. In this respect my answers from my experiences are based on the basis of the Baden-Württemberg Monument Protection Act.

Bavarian City
Currently we have 3 battery storage systems running in schools and kindergartens, none of them in listed buildings. But we have installed two PV-systems in a protected HUC area, one on the city's town hall roof and one on the façade of a school building vis-á-vis the historic city wall. Both are using special red PV panels.

Energy Agency of the state of Northrhine-Westphalia
As an advisory institution of the State of NRW, EnergyAgency.NRW has a wide range of contacts with projects implemented or in the planning stage in the municipal sector. In many of the projects, the inclusion of energy storage systems in the supply concepts is standard practice. They are standard for all heat generation technologies that require the heat generator to operate as continuously as possible (CHP, heat pump, wood firing), for supplied objects with strong fluctuations in the quantities purchased (hot water demand in sports facilities) or for weather-dependent energy production and therefore not simultaneous generation and demand (solar thermal).

Energy management is also established in NRW. In the case of local authorities, we assume that around 75 % will have a functioning energy management system, although of course we still have to differentiate what the EMS actually comprises. In any case, in these cases one can assume that the municipalities know the energy consumption of their buildings and plan and optimise the technical supply accordingly.

Is it easy to get the permits for such kind of installations in Germany (if the stakeholder does not have any experiences yet, what does he think about it)?

City of Heilbronn
Energy storage planning in cultural monuments is a new topic for me. Basically think I believe that the storage elements used, such as batteries and heat accumulators, which are housed in the adjoining rooms in the basement of a cultural monument and have no appreciable effect on the appearance and the historical substance, can rather be regarded as being compatible with the monument. However, it is always a case-by-case decision of the responsible authorities, because each cultural monument is individual.

I have also not yet dealt with the digital recording of the energy consumption of cultural monuments and the associated problems. Here, too, the statement already made applies - e.g. with regard to cable and pipe routing.

Bavarian City
When talking about the storage system itself, getting the permission is not difficult. Those systems are usually installed in the basements and do not have any issues with historical building protection. The challenge is to get a permission for the energy generation unit (i.e. PV panels or solar thermal modules) which is visible from outside.

Energy Agency of the state of Northrhine-Westphalia
I am not aware of any difficulties in approving energy storage devices.

Are there already some best practice examples the participant is involved/know about?

City of Heilbronn
No, I'm afraid not.

Bavarian City
See above for examples. It is always better to work closely together with the people responsible for permissions for listed buildings at an early project state. They make the final decision and set the rules to get it, therefore it makes sense to develop a way forward together. In our city, the co-operation is quite good and the responsible people are open for new ideas. In other cases that I personally know, other cities sometimes have more problems.

Energy Agency of the state of Northrhine-Westphalia
No, I'm afraid not. There are many realized projects in which energy storage was realized in the listed area. However, this is often not explicitly emphasized, since the storage is dependent on the technology, not on the building (=> first question and answer).

However, I am also aware of a project in which a quarter in a listed area is to be supplied with electricity: Energy Laboratory Ruhr: https://www.energieagentur.nrw/tool/kommen/detail.php?ID=29380

Which kind of storages are preferred in Germany? (are some easier to install/get permits in HUC than others)?

City of Heilbronn
I have no experience and no knowledge of this.

Bavarian City
Heat storage systems are more difficult to get permission for, because – as far as I know – the solar thermal modules are always black. Therefore, in our case it would not be possible to get a permission for red roofs of listed buildings. Since PV panels are available in different colours, it is easier to have them installed on listed buildings. But it is economically not feasible, see below.

Energy Agency of the state of Northrhine-Westphalia
The main technology in the heating sector is hot water storage tanks.

Are there also some latent heat storages used (as planed in Lendava)?

City of Heilbronn
I have no experience and no knowledge of this.

Bavarian City
No. We have district heating in our historic city centre, therefore no need for heat storage.

Energy Agency of the state of Northrhine-Westphalia
The most common variant of latent heat storage is ice storage. The technology is currently establishing itself on the market. The last teething troubles are just being eliminated. I know of a regional church that focuses on wood pellets + ice storage in its CO2 reduction programme. Here also objects in the monumental area could have been realized. However, I cannot ask my colleague right now because she is on summer holiday.

I am not aware of any paraffin storage facilities that have been realised.

Is it possible/easy to get a permit for PV systems in HUCs?

City of Heilbronn
The question must be considered in a very differentiated way and it is not easy in principle to obtain permits under monument protection law for such installations. What is decisive first of all is how the cultural monument is classified, e.g. in Baden-Württemberg, whether it is a cultural monument according to § 2 DSchG or a cultural monument of special importance (§ 12 DSchG). Cultural monuments of special importance enjoy special protection in Baden-Württemberg through their entry in the Register of Monuments. They are also protected with regard to their effect in their surroundings, i.e. changes in the appearance of surrounding, non-listed buildings are also not possible without further ado. Furthermore, there are still complete areas according to § 19 DSchG, such as historical city centres.

A further aspect is the nature of the cultural monument and how much original substance and possibly listed substance from other more recent style epochs is preserved. Each decision is an individual decision of the competent authority.

Bavarian City
It depends on the people working in the institutions. In our city, the responsible person for historic buildings has set up some rules to get permission. For example, PV panels have to have the same colour like the roof tiles, i.e. red in our case. Also, the PV-system has to be integrated into the roof. When these rules are followed, PV-systems would be permitted. Unfortunately, the high costs of special red PV-panels make these systems economically inefficient and private investors as well as e.g. the local perishes refrain from installing these systems.

Energy Agency of the state of Northrhine-Westphalia
It is very difficult to obtain approval for PV systems in Germany in general and in North Rhine-Westphalia in particular. The reason for this is the very consistent protection of historical monuments. The approval of building measures in the area of the protected buildings must be granted by the monument protection authority. However, the officials there always have the decisive word. A weighing of goods takes place very rarely.

A distinction must be made between:
- The protected area and
- The solar system at or on a protected building

Protected area
The image of a place is protected. This can be the "skyline" of the place as well as the picture of the streets. In this case, the elements of the PV system would result in a disturbance factor in the roof image, so that no PV system can be approved - even for new buildings. One has a chance in the case of non-publicly visible parts of buildings that are not listed as historical monuments.

Although there are similarly designed PV modules for historic roof tiles, the question of whether they are recognisable or even disturbing depends on the individual assessment of the respective regional authority. Its decision is then incontestable. In all cases known to me, the approval was refused.

A solution approach would be precedents, preferably from the direct environment or federal state, but to the best of my knowledge there is no corresponding survey.

Solar system on a protected building
Here the restrictions lived are even harder. The specification of the monument protection is that the original building substance is to be preserved absolutely original. Drilling a hole already means damage to the existing structure and, depending on the object, is viewed very critically. Actually, measures which are normally not visible and do not mean any intervention in the protected building fabric should be able to be approved, but also here the approval is often refused. In NRW, there are no PV systems known to us on listed buildings - rather the other way round: we are aware of several cases in which realised systems on monuments had to be removed again.

Good examples:
https://www.infranken.de/regional/kitzingen/Die-Sonne-lacht-fuers-Denkmal;art113220,2637607
https://www.freiburg.de/pb/,Lde/1059456.html

The difu brochure "Climate Protection & Monument Preservation" is very worth reading, especially the example of the city of Fürth on pages 61-63:
https://difu.de/publikationen/2011/klimaschutz-denkmalschutz.html

The fact that one can see it also differently shows this court decision:
https://www.stuttgarter-zeitung.de/inhalt.solaranlage-klimaschutz-schlaegt-denkmalschutz.9bd801fa-d42a-4fd9-a922-281558bc37a6.html

Yes, and then there is the statement of the monument protectors: "Arbeitsblatt 37: Solaranlagen und Denkmalschutz".

With this worksheet, the Association of State Monument Preservers defined its position on the approval of photovoltaic systems in the monument sector as early as spring 2010. It states among other things:

"The preservation of historical monuments is also not fundamentally closed to climate policy goals and sees solar energy as a sensible application technology. However, it also says that the public interest in climate protection does not enjoy a privilege over the interest in the protection of historical monuments. And elsewhere: solar systems usually [...] represent a sensitive disturbance of the historical and monumental appearance of a monument. They are rarely compatible with [...] traditional covering materials."

At the same time, however, the hope is expressed that further technical developments will help to minimise interventions in the substance and/or appearance of monuments or show alternatives without negative influences on the objects of protection.

Furthermore, possible test criteria for the always necessary individual case examination are defined. In summary, it can be said that solar systems are most likely to be approved if they:

- primarily serve the energetic supply of the monument,
- the location of the installation is inconspicuous or cannot be seen from the public space,
- the intrinsic effect of the system modules is as small as possible,
- they are subordinate to the overall appearance of the monument in terms of colour, structure and size, and
- they can be integrated into the design character of the existing architecture.

Link to the worksheet:
http://www.vdl-denkmalpflege.de/fileadmin/dateien/Arbeitsbl%C3%A4tter/Nr37.pdf

From the site:
http://www.vdl-denkmalpflege.de/veroeffentlichungen.html

Are PV roof tiles or translucent PV systems an alternative to conventional PV systems in HUCs?

City of Heilbronn
The fairness of materials is of great importance in Baden-Württemberg. This also involves numerous building physics issues that have to be examined on a case-by-case basis. I myself have no practical experience in this field.

Bavarian City
As said above, red PV roof tiles would be perfect, but these are even more expensive than standard-sized red PV panels. Therefore – theoretically yes, practically no.

Energy Agency of the state of Northrhine-Westphalia
As described above: Theoretically "yes", practically unfortunately so far: "No".

Not asked, but the answer is obvious:

What is the situation regarding the realization of energy storage systems in the listed area?
As described above, there should be no approval problems as long as no intervention in the historical inventory is required for the realisation.

There can also be problems if the energy concept requires in addition to the energy storage pipes have to be laid for this. Especially in historical town centres there are often archaeological finds which are then "excavated" and possibly have to be preserved. Then the laying of a local heating pipe through the foundation of a medieval house can become difficult.

Excursus: Network "Energy & Church" in Germany

The contact person in the Energy Agency of the state of Northrhine-Westphalia is managing the network: „Energy & Churches“ in Germany

The network was founded three years ago. The aim was to cooperate more at the technical level, to facilitate a direct exchange of expertise and to implement projects together. Currently 145 employees from the fields of construction, energy and climate protection from 29 different dioceses and regional churches are represented in the network. These are employees from the church districts (Kirchenkreise) as well as from the regional church offices (Landeskirchenämter) and general vicariates. All hierarchical levels are also represented in the network, from specialist architects from the church district (Kirchenkreis) and climate protection managers to diocesan master builders (Diözesanbaumeister) and regional church building directors (Landeskirchenbaudirektor. - If one wants to reach the actors in the field of energy efficiency and climate protection from the church sector, the network probably offers the best platform.

Unfortunately, the network itself is a "closed-shop", which means that I cannot give you direct access to the network. But I am happy to offer you to bring your requests and information into the network. The resources are also limited in the church area, but if your information / offers / inquiries have a certain nutritional value for the church representatives, I can well imagine that you can get support from this area.

In my opinion, the topic of climate protection and sustainable energy supply in the building sector has been more well received by the churches than in the municipal sector. In the cities and municipalities of NRW, the financial limits are still decisive. An investment in the municipal sector must be refinanced in around 10 years for it to be eligible for approval. And since the majority of municipalities do not have a balanced budget, the freedom is rather limited. The situation is different in the church sector. The "preservation of creation" is one of the basic missions of the churches. Accordingly, climate protection in general and the achievement of a CO2-neutral building stock is a task to which many dioceses and regional churches (Landeskirchen) are intensively dedicated. A CO2-neutral building stock includes the use of renewable energies on the one hand and since the simultaneity of energy use is usually not given, the installation of energy storage systems is a natural part of the projects on the other hand. If this knowledge is combined with the quota of listed buildings in the church area, the relevance of your project for the churches becomes clear.

An example: In a parish, the renewal of the boiler for the church is on the agenda. In the immediate vicinity of the church, in addition to the kindergarten, community centre and parsonage, there is also a rented multi-family house - this or similar is the case in many parishes. One can already speak of a quarter. As the church's boiler accounts for around 40 % of the total installed capacity, it is being considered whether to find a sustainable heat supply for this area. Each of the envisaged energy technologies requires a heat storage to decouple generation from demand. It is usually planned as a daily balance, but the first weekly storage tanks are also being considered. A very desirable option would be the combination of solar thermal with a seasonal storage tank, but these variants are not yet known to me.

If solutions are worked out in your project for such an application, then they are particularly exciting for the churches. As I said, I am happy to bring your information / requests / etc. into the network.

5. Implemented actions and links to deliverables, outputs

Like already mentioned above the main action consisted of contacting different city representatives by phone, explaining the targets of the Store4HUC project and sending additional information by email. In order to obtain a written feedback, usually several phone calls are necessary. The contact persons got chosen from cities with a long history, where we suppose that they have monument protected buildings within its areas. They got chosen looking on the background with a possible professional knowledge in monument protection. Some representatives got approached during participation in events or invited to personal meetings. We tried to get in contact with monument protection authorities through persons who are already in contact with them. We contacted the manager of another city network hoping to get through him direct contacts to some additional cities and we kept in mind that we need contacts representing different target groups. The action took place in a very early stage of the project. At this time no promotional material was available. We used the information provided about Store4HUC in the press release and the Climate Alliance news section of the homepage and the Store4HUC subpage running on the Climate Alliance homepage. At this early stage of the project there is no connection with Store4HUC deliverables. Now the situation changed and meanwhile the Store4HUC website and social media accounts on facebook and linkedIn are online.

6. Results

We received written feedback from 2 municipalities and one energy agency. Two other municipalities did respond in a positive way showing interest in following the project. They didn't want to provide written feedback because they are just starting being active in the Store4HUC field and don't feel save writing about this topic.

Problems

- Building measures for climate protection at cultural monuments often are in conflict with the legal regulations for the protection of historical monuments
- energy storage systems are likely to be of particular interest for individual and ensemble supply systems and local heating solutions
- often the requirements as a basis for the planning of the storage facilities are not known. Especially if the energy supplier is not the owner of the buildings to be supplied
- A big difficulty is planning security because an investor will only know the actual requirements very roughly. Therefor a modular, expandable concept is recommended
- In HUC there are problems with the structural integration of the storage facilities into the existing system

Needs

- The investor is free in the planning and technical conception, but the listed building must remain intact

Opportunities

- Often not all buildings are listed in a HUC. This means there is more room for manoeuvre for the interior of the buildings. Changes to the external appearance of "non-cultural monuments" in historical areas are often subject to approval (e.g. through design statutes)

Local differencies

- In Germany the protection of historical monuments is in the sovereignty of the federal states, i.e. each federal state has its own law for the protection of historical monuments
- Basically, the laws regarding (electrical) energy storage are the same, but the law hands over the final responsibility for grid stability to the respective distribution system operator. Therefore, a large electrical storage system with high power output may be allowed in one region but not allowed in another region, due to grid issues
- Heat storage systems are usually not connected to any grid, therefore registration and approval is not necessary
- For planning and implementation there are the standards of the professional associations (DIN, VDI, DVGW etc.) which are regarded as recognized state of the art and which should be observed

Experiences of the participant

- One of the participants providing feedback has worked for 10 years in the lower protection monument authority of a german state. An energy manager runs battery storage systems in not protected buildings and PV-systems in a protected HUC area.

- The consultant of the energy agency has a wide range of experience with municipal projects and energy storage.

Permits for installations

- Always it is a case-by-case decision of the responsible authorities, because each cultural monument is individual. Basically the storage elements which are housed in the adjoining rooms in the basement of a cultural monument and have no appreciable effect on the appearance and the historical substance, can rather be regarded as being compatible with the monument. The energy manager of the bavarian city says that the challenge is to get a permission for the energy generation unit (i.e. PV panels or solar thermal modules) which are visible from outside.

Best practice examples

- The representative of the city of Heilbronn knows no best practice examples, the energy manager from the bavarian city only very few. The NRW energy agency representative seems to know several examples. One of these is in the framework of the Energy Laboratory Ruhr

Kind of storage

- The main technology in the heating sector are hot water storage tanks. Solar thermal modules are always black. Therefore it would not be possible to get a permission for red roofs of listed buildings. Since PV panels are available in different colours, it is easier to have them installed on listed buildings. But it is economically not feasible.

Latent heat storages

- City of Heilbronn is not aware of any paraffin storage facilities that have been realised. In the Bavarian city they have district heating in their historic city centre, therefore no need for heat storage.
- In NRW the most common variant of latent heat storage is ice storage. The technology is currently establishing itself on the market. The representative knows of a regional church that focuses on wood pellets + ice storage in its CO2 reduction programme.

Permit for PV systems

- The question must be considered in a very differentiated way. The permit depends on how the cultural monument is classified. In Baden-Württemberg in case it is a cultural monument of special importance it enjoys special protection. In that case the buildings are also protected with regard to their effect in their surroundings including non-listed buildings. Each decision is an individual decision of the authority. In the Bavarian city everything depends on the people working in the institutions. If the set up rules of the person in charge are obeyed a permission is possible.

- The NRW energy agency confirms that it is very difficult to obtain approval for PV systems.

- The officials in the monument protection authority have always the right to decide. If the whole area is protected no PV system can be approved - even for new buildings. Although there are similarly designed PV modules for historic roof tiles, in all cases known to him the approval was refused. In NRW, there are no PV systems known to the energy agency on listed buildings.

PV roof tiles

- The high costs of special red PV-panels make these systems economically inefficient and private investors as well as e.g. the local perishes refrain from installing these systems. Energy Agency of the state of Northrhine-Westphalia states that in theory PV roof tiles would be a solution but practically its not possible to obtain a permit.

7. Conclusion

- Getting a permission for installing PV or energy storage in historical buildings can be difficult. In some german states practically impossible. It depends on the rules set by the persons in the monument protection authorities.

- Because of financial restrictions in the municipalities its more likely to install a storage system related to the churches.

- In the days of writing this report in the city of Würzburg organizes an event dealing with using solar energy in the old part of the city. As they are member in Climate Alliance we could plan a common event with Store4HUC and I would like to have a storage seminar with them.

- It seems that the topic of climate protection and sustainable energy supply in the building sector has been more well received by the churches than in the municipal sector. As the "preservation of creation" is one of the basic missions of the churches, the achievement of a CO2-neutral building stock is a task to which many dioceses and regional churches (Landeskirchen) are intensively dedicated. The installation of energy storage systems could be a natural part of the projects to reach this goal. If this knowledge is combined with the quota of listed buildings in the church area, the relevance of the Store4HUC project for the churches becomes clear.

- The network “church + energy” itself is a "closed-shop", which means Store4HUC can not get direct access to the network. But the stakeholder could bring our requests and information into the network. If the Store4HUC informations and tools have the expected value for the church representatives, we should get support from this area. We should concentrate on testing the tools in Germany with the churches.

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8. Annexes

8.1. Web-links related to the action

Good examples:
https://www.infranken.de/regional/kitzingen/Die-Sonne-lacht-fuers-Denkmal;art113220,2637607
https://www.freiburg.de/pb/,Lde/1059456.html

The difu brochure "Climate Protection & Monument Preservation"
https://difu.de/publikationen/2011/klimaschutz-denkmalschutz.html

Court decision:
https://www.stuttgarter-zeitung.de/inhalt.solaranlage-klimaschutz-schlaegt-denkmalschutz.9bd801fa-d42a-4fd9-a922-281558bc37a6.html

Arbeitsblatt 37: Solaranlagen und Denkmalschutz

Link to the worksheet:
http://www.vdl-denkmalpflege.de/fileadmin/dateien/Arbeitsbl%C3%A4tter/Nr37.pdf
From the site:
http://www.vdl-denkmalpflege.de/veroeffentlichungen.html

DOCUMENTATION ON DECISIONS OF 1ST „DEPLOYMENT DESK MEETING”

SLOVENIA

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Content

1. Summary

This document provides the insight into the 1st deployment desk meeting that have been organised in September 2019 at the Municipality Lendava for pilot process implementation in the frame of Stor4HUC project. The participants were composed from the internal stakeholders (this is to be the employees from Municipality of Lendava) and the external stakeholders (representatives of different public utilities, institutions, and of Development agency Sinergija). The external stakeholders have been invited by the municipality. The meeting has been important for engaging the stakeholders into the process, to be part of the pilot action process implementation (installation of the energy storage in Lendava) and to disseminate a positive information on pilot to wider audience. The original idea to include them into the stakeholder group has been to obtain the information and feedback. Their opinion worth and should be considered to make the commitment on the pilot approval and implementation bigger. The inputs have been recorded and are provided in this report below, the input facilitate the pilot implementation. The participants are aware of the procedure and about the aim of the pilot.

2. Date and place

The 1st Deployment desk in Slovenia was held on 23rd of September 2019 in the City hall of Municipality of Lendava.

3. Number and types of participants/target groups

The meeting was attended by 15 participants. There was different type of the organisations:

- Lendava Primary school – possible multiplier;
- Lendava High school;
- Public utility company;
- Public/city gallery-museum organisation;
- Institute for Tourism and Development Lendava;
- Geological survey Slovenia;
- Municipality of Lendava;
- Public housing company;
- City Library Lendava;
- Local energy agency Pomurje;
- Development agency Sinergija.

4. Topics tackled

The aim of the 1st Deployment desk meeting was to generally present the idea behind the project and to identify the problems, needs and opportunities on EMS and energy storage and energy planning. The representative of Development agency Sinergija Štefan Žohar presented the main idea of the pilot action. He focused on potential technical and logistical solutions of the Paraffin based latent storages in connection with geothermal district heating system in Lendava. The constrains have been highlighted as well, such as the closest connection of the geothermal network, the efficiency of the intended system, the possible energy back-up´s, the costs provided and the location of the installation of the paraffin storage. The discussion followed the presentation which was moderated by Katja Karba.

4.1. Suggested questions

First topic: General questions about EMS and storages in HUCs

international:

- What are the problems on EMS and energy storage planning in HUCs in Slovenia/Lendava?

On regional (and also on national) level we do not have any real good examples on EMS and energy storage planning and investments in HUC´s. So, the energy managers have no experiences in this sector and also often no clear guidelines.

- At the national level, it is common that cooperation is assessed as purely official and often inefficient, although the level of cooperation varies between institutions
- The central government stakeholders are often bureaucratic and sometimes very rigid,
- Slovenia has no regional government. The main instruments/policies are adopted by the Ministry at national level In Pomurje region
- There is almost no connection between different segments / development areas on regional level. Very important is the fact that there is no connection between energy projects and spatial planning – especially in HUC´s. Thus, the connection and coordination between these two different areas is totally necessary and a key aspect to the successful of the regional development in the future. The current situation and approach, within Pomurje region, on integrated planning is increasing but it is still very low. Regional planning is not integrated and there is a low level of understanding and collaboration between these two areas, i.e. spatial and energy planning.

- What are the needs on EMS and energy storage planning in HUCs in Slovenia/Lendava?

On regional (and also on national) level we need real good examples on EMS and energy storage planning in HUC´s.

On the long term we must develop a new long-term Strategic Sustainable Energy Plan with incorporated Regional Action plan for the energy efficiency and exploitation of renewable energy sources (HUC´s included as a special areas) as a basis for future documents.

- What are the opportunities on EMS and energy storage planning in HUCs in Slovenia/Lendava?

In the frame of the current national regulations/restrictions related to cultural/historical protected buildings, we still have space to develop and achieve significant results on EMS and energy storage planning also in HUC´s. Our latent storage pilot will hopefully be a good example for further development in this sector and will hopefully encourage also other cities/energy managers/spatial planners to implement such kind of energy solutions in their HUC´s.

- What experiences does your external stakeholders have with this topic?

The stakeholders attended the first deployment desk meeting don't have specific and concrete experiences with the energy storages. But they find the topic interesting and relevant based on the arguments provided during the discussion. Especially they are curious on the replication effect on other buildings.

- Are there already some other best practice examples?

If we are talking about the connection between geothermal district heating and latent energy storages, there are no other (good or bad) practises in Slovenia, although thermal energy storage technologies and geothermal district heating systems have the potential to play a significant role in the transition towards 100% renewable energy systems through increasing system flexibility and overall efficiency and thus reduce CO_2 emissions and increase domestic energy security, additional reduce the costs of heating.

Also, the use of paraffin cells are innovative buffer storages that have been developed to efficiently store heat and cold generated from small irregular energy sources such as solar energy, heat pumps etc. – so we do not have any known good examples on this.

In case of thermal energy storage technologies (water based) and biomass district heating systems we have some very good examples also in our region (Martjanci, Kuzma, Beltinci…).

Second topic: Pilot specific technical/legal framework conditions

international:

- Short explanation of the targets of your underlying energy concept/plan. Have the various stakeholders agreed on these objectives?

Our pilot is in accordance and in line with the measures and goals of most important strategic action plans of Lendava municipality:

- Sustainable Energy Action Plan of Municipality Lendava (SEAP) - 2012:
  - Measure No.11: Supplementary heating of buildings with geothermal energy from the Lendava geothermal well
  - SEAP target till 2020: Reduction of CO_2 on municipality level: 12.122,41 tonnes (36,2 %) from baseline year 2001
- Local Energy Concept of Municipality Lendava (LEC) - 2012:
  - Measure No.15: Promotion of district heating by geothermal energy
  - Measure goal: The goal is to expand district heating to geothermal energy in the selected area or to connect interested users/public buildings.

Lendava pilot objectives:

- Reduction of energy consumption/share of fossil fuels: 60 MWh (current consumption of heating oil in Lendava Library);

- Reduction of CO_2 Emissions Pollution: 16,8 tons of CO_2 (geothermal energy has an CO_2 emission factor of "0");
- Exploitation of renewable energy – geothermal energy: 57 MWh (savings related to energy storing included);
- Increase of energy efficiency: 5,5% or 3 MWh;
- Implementation and presentation of an innovative way of energy storing;
- Integration of political decision makers/public sector in the development and implementation process of the pilot project – as a basis for further promotion of the project to other sectors and integration of measures into the policies.

- If not, what are their points?
- Are there any critical issues regarding to the cultural heritage protection?

There are a few issues that should be pre-defined and pre-solved with the responsible and competent institution which is Institute for the Protection of Cultural Heritage of Slovenia and which could issue the cultural consent. The general information received so far is that the pilot building (public city library) protected by the law is not protected as a whole building but only the outside of the building (envelop of the building) for which the permission could be received easier than usually.

- What are good KPIs for the pilot plant?

At least the following parameters will be measured/recorded - accurate real-time data for:

- supply temperature (between DHS and heat exchanger)
- supply temperature (between heat exchanger and storage)
- return temperature (between storage and heat exchanger)
- several calorimeter's
- thermal power
- flow
- Etc.

national:

- What is the opinion of the stakeholders about (paraffin based) latent heat storages?

In general, the idea is interesting. The participants are satisfied that the investment will not cause any harmful impact on the environment. They find the idea of heating the premises of the library good idea in order the temperature of the rooms don't drop too much at night.

- Why have they never been installed in Slovenia before?

The pilot is an innovative investment at national level, such installation has not yet been built anywhere in the Slovenia and in this case the pre-investment report will give us clear technical overview/specifications. The reason is that the geothermal energy could be exploited only in the north-eastern part of the Slovenia (especially in Pomurje region) as the potential is a lot better in this part of the country. The idea of the latent thermal storage is quite new also.

- Does anyone have some experiences with this kind of storages anyway?

Not actually, but in any case, the investment can serve as an example of good practice in the project area-example of innovative solution of storing renewable energy in an effective way. After the investment an effective monitoring report will be prepared using energy management tool developed to see the results of the investment (CO_2 savings, kWh savings, cost savings, etc.).

- Are there some other possible solutions? /Why is the latent heat storage the best option?

Our pilot building (Lendava Library) will be the last connection in the geothermal district network/grid and the supply is NOT stable - the temperatures are and will not be constant also in the future. This was the main reason, why they didn´t changed the fossil fuel in this building yet - the storage in our pilot is CRUCIAL for us, to change the heating source into RES. The storage will in this case ensure the stable supply for end-users. The advantage of paraffin used storages before regular water storages: requires less space, which is very important especially in case of Lendava library.

Third topic: Pilot specific social/political aspects

international

- Who are the main actors and how are they connected?

The main actor of the pilot is a provider of the geothermal energy and the owner of the geothermal network/district heating system in Lendava city. They are Petrol Geo. The second main actor is Municipality of Lendava, the financer and the end-user of the storage. The next important actors are the Lendava library where the storage will be located and the Institute for the Protection of Cultural Heritage of Slovenia that commands the legal requirements.

- How effectively policy development and implementation are integrating relevant economic, social, energy and environmental aspects?

Municipality of Lendava implements the measures and goes in line with the guidelines of their Local Energy Concept, which represents their concept of developing a self-governing local community in energy supply and use, which in addition to energy supply plans includes measures for energy efficiency, cogeneration of heat and electricity and the use of renewable energy sources. And together with other strategic documents (SECAP, Municipal Spatial Plan, etc.) their follow also the aspects of economic, social and environment.

- What will be the benefits for the citizens, respective end-users / for the municipality / for the surrounding neighbourhood?

As a snow ball effect and as an added value other municipalities and regions will benefit from the good practice case and experiences. The pilot case will serve as a show-character for EE/RES measures on the transnational and regional level. The Municipality of Lendava is quite interesting in the replication effect of the pilot, to apply the pilot in other public buildings (e.g. schools, kindergartens). At the meeting there was also the representative of the Public housing company that manages the residential buildings. If the pilot will be successful story the company could replicate the idea in the apartment blocks, in that way the citizens could benefit as well.

- How evident are they for your municipality?

There are several advantages of latent paraffin-based storages against the “usual” thermal heat storages: Require less space – smaller dimensions; Less temperature loss; Less reactivity with the environment and less likelihood of leakage as it changes phases; Better heat transfer performances=higher efficiency=lower heating costs.

- How may the project Store4HUC influence your municipal policy strategy?

The pilot and the project itself will have the positive impact on the municipal policy. If the pilot shows the success and the good results, the municipality could focus more on geothermal energy and proposed the measures linked to the pilot solutions.

- What are the targets for your stakeholders for participating in the deployment desk (self-assessment)?

- Learning something new and gain the knowledge.
- Improvement of collaboration and communication between different sectors/stakeholders/departments.
- Learning the results in order to replicate the idea.
- The provide the ideas and solutions for successful implementation.
- To reduce the costs of the energy.

5. Implemented actions and links to deliverables, outputs

The meeting was held in the moderated way, first the presentation was carried out, then the questions were asked by the moderator. It was used the PowerPoint presentation. The questions have been divided into three topics:

- General questions about EMS and storages in HUCs.
- Pilot specific technical/legal framework conditions.
- Pilot specific social/political aspects.

The participants were invited by Municipality of Lendava. They received the invitation and were phoned as well to ensure the attendance. The same participants attended also Kick-off event (D-C.6.7) for launching the pilot.

6. Results, effects and the response

The participants were positive in terms of the new idea and the pilot storage presentation. The discussion followed by the presentation was long and intensive, all participants provided the feedback and their opinion. The comments provided are useful for the further work and brought added value. The participants were curious if the storage also consumes additional energy for operation. The replication of the idea was also discussed and how much should (additional) storages differ compared to the pilot storage (are there modification required and possible). It was pointed out that the optimisation of the storages is necessary. E.g. the pilot storage should be filled in the peak when the water is the hottest. The old boiler heated by fossil fuel will remain in case the temperate outside in the winter will be low (around -20 degrees). Just in case the location for the storage should be again checked, but after careful spot check the storage will be located in the library itself and not in the building close to the library.

The representative from the public Housing company that managing several residential blocks, provided productive feedback, namely he stressed out that heating the building at night makes sense when the temperatures drop down to 0 degree. He is interested to apply the idea into several residential blocks. At the moment they have optimal heating system which based also on the geothermal energy. He asked also why not install the solar PV, instead of thermal storage.

The paraffin-based storage was selected due to small volume that occupies in the boiler room. The director of the library highlighted a few issues that it should be considered when planning. These are: in library are still old cast iron radiators and the old windows, all these aspects could reduce the effect of the storage and the question arise whether to first manage the energy efficiency of the building and then exploit the renewable energy sources. How the library (the municipality actually as it is the owner of the building) will maintain the system if it is not energy efficient. Although the director hesitates, he supports the storage installation and is looking forward for reduction of the costs. The representative of the Local energy agency Pomurje argue that the costs could be reduced for around 50% and the heating is possible also with the old radiators. The investment could be reimbursed in 7 years and it has positive environmental and economic impact.

The participants were satisfied with the event.

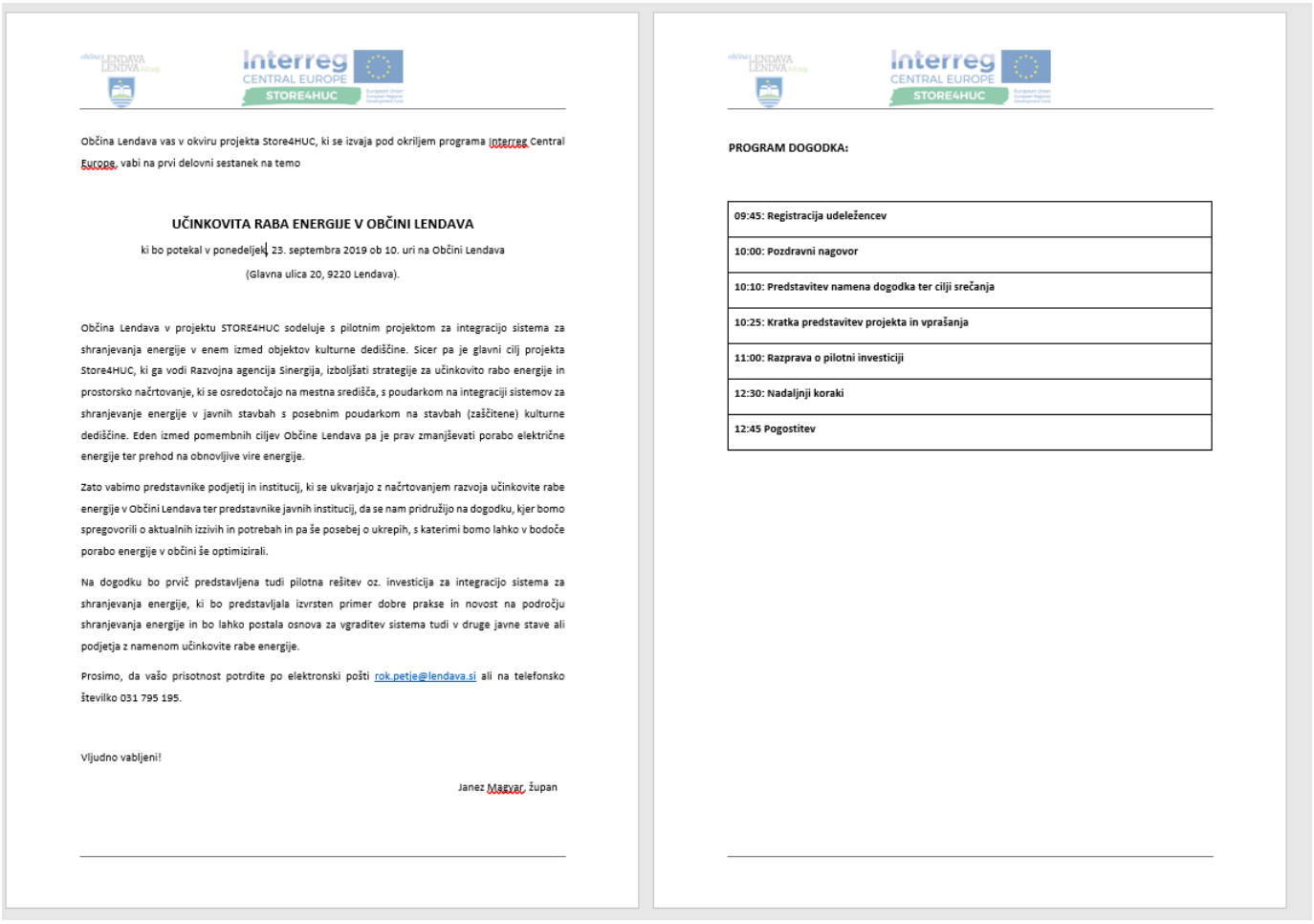
7. Conclusion

The event was successful as the participant were beneficial and actively involved in the discussion. Each of them presented their point of view. In the future events they requested to present more concrete technical solution and operation of the storage. They liked the innovative topic which is attractive and did like also the exchange of opinions. Common argument for proceeding towards the pilot was that it does not produce any emissions, so it is green/clean solution. The pilot idea will be implemented and will serve as a role model for other institutions.

At the meeting a valuable feedback was gained which will facilitate the further work on the pilot. The stakeholders are engaged and will cooperate in the future meetings.

8. Annexes

8.1. Invitation and Agenda



Občina Lendava vas v okviru projekta Store4HUC, ki se izvaja pod okriljem programa Interreg Central Europe, vabi na prvi delovni sestanek na temo

UČINKOVITA RABA ENERGIJE V OBČINI LENDAVA

ki bo potekal v ponedeljek, 23. septembra 2019 ob 10. uri na Občini Lendava

(Glavna ulica 20, 9220 Lendava).

Občina Lendava v projektu STORE4HUC sodeluje s pilotnim projektom za integracijo sistema za shranjevanja energije v enem izmed objektov kulturne dediščine. Sicer pa je glavni cilj projekta Store4HUC, ki ga vodi Razvojna agencija Sinergija, izboljšati strategije za učinkovito rabo energije in prostorsko načrtovanje, ki se osredotočajo na mestna središča, s poudarkom na integraciji sistemov za shranjevanje energije v javnih stavbah s posebnim poudarkom na stavbah (zaščitene) kulturne dediščine. Eden izmed pomembnih ciljev Občine Lendava pa je prav zmanjševati porabo električne energije ter prehod na obnovljive vire energije.

Zato vabimo predstavnike podjetij in institucij, ki se ukvarjajo z načrtovanjem razvoja učinkovite rabe energije v Občini Lendava ter predstavnike javnih institucij, da se nam pridružijo na dogodku, kjer bomo spregovorili o aktualnih izzivih in potrebah in pa še posebej o ukrepih, s katerimi bomo lahko v bodoče porabo energije v občini še optimizirali.

Na dogodku bo prvič predstavljena tudi pilotna rešitev oz. investicija za integracijo sistema za shranjevanja energije, ki bo predstavljala izvrsten primer dobre prakse in novost na področju shranjevanja energije in bo lahko postala osnova za vgraditev sistema tudi v druge javne stave ali podjetja z namenom učinkovite rabe energije.

Prosimo, da vašo prisotnost potrdite po elektronski pošti rok.petje@lendava.si ali na telefonsko številko 031 795 195.

Vljudno vabljeni!

Janez Magyar, župan

PROGRAM DOGODKA:

09:45: Registracija udeležencev
10:00: Pozdravni nagovor
10:10: Predstavitev namena dogodka ter cilji srečanja
10:25: Kratka predstavitev projekta in vprašanja
11:00: Razprava o pilotni investiciji
12:30: Nadaljnji koraki
12:45 Pogostitev

8.2. List of participants

Interreg CENTRAL EUROPE European Union European Regional Development Fund
STORE4HUC

D.T1.1.2: 1. srečanje deležnikov in D.C.6.7: Kick-off srečanje za pilot, Lendava, 23.09.2019

Interreg CENTRAL EUROPE European Union European Regional Development Fund
STORE4HUC

8.3. Pictures

8.4. Media coverage

The media announcements were at the 2 online local news media: Lendava info and Lendava danes.

The links are provided in the next chapter.

8.5. Web-links

http://lendavainfo.com/pilotni-projekt-za-integracijo-sistema-za-shranjevanje-energije-v-lendavski-knjiznici/

http://lendavadanes.si/sl/blog/sodelovanje-delavnica-v-okviru-projekta-store4huc
https://www.kl-kl.si/360/

DOCUMENTATION ON DECISIONS OF 1ST „DEPLOYMENT DESK" MEETING **CROATIA**

D.T1.1.2

Version: final

10 2019

Title	Documentation on decisions of 1st “Deployment Desk” Meeting in Croatia
Deliverable	D.T1.1.2
Authors	Alois Kraußler, Robert Pratter, Matija Hrupački, Mario Vašak, Reiterer & Scherling
Contributors	Filip Rukavina, Kristina Radoš Cvišić, Kristijan Škoc, Vinko Lešić, Mateja Car
Status	final
Reviewed by	
Submission	

Content

1. Summary

This document contains minutes on the 1st deployment desk meeting organized in Zabok where the pilot site Bračak Manor is located. It demonstrates decisions of the deployment desk meeting connected to identification of problems, needs and opportunities on EMS and energy storage planning.

The recently renovated Bračak Manor is already equipped with wood pellets boiler for heating, micro CHP for hot water and power production during summer, air-water heat pump system for cooling and heating in transitional periods, wall insulation on the inside and energy efficient windows and doors, efficient lighting system, HVAC system, advanced central BMS for monitoring of heating, cooling and energy consumption, rainwater harvesting for irrigation of green areas and wastewater treatment as well as electric vehicle charging station. It is planned to add a properly sized photovoltaic system and battery storage to it (up to 10 kWp and 10 kWh). The already existing systems will be combined with the new ones through an advanced energy management ICT system that can be built on top of the already existing central monitoring system as a coordination service that optimally exploits different available assets. The introduced energy management system will inherit the preview projects (3Smart) in which its modular parts for central HVAC system level management of heat production via micro CHP and wood pellets boiler and heat storage will be combined with the photovoltaic and battery system introduced on the top-level (microgrid-level) of the pilot site operation.

The main target of the first Deployment desk meeting was to bring together all so far envisioned relevant stakeholders, present the pilot planning to them, receive their initial feedback and agree on the next steps related to pilot deployment as well as their involvement. Deployment desk meeting was the first of four deployment desk meetings and focus was on the integration of stakeholders as well as selected players whose support will be needed for the future implementation of the pilot systems. The meeting was attended by representatives of the Krapina-Zagorje County, Conservation Office in Krapina, Croatian electricity distribution system operator (HEP-ODS), Ministry of Construction and Physical Planning, Zagorje Development Agency (ZARA), Croatian Association of Historic Towns (HUPG) and representatives of project partners University of Zagreb Faculty of Electrical Engineering and Computing (UNIZGFER) and North-West Croatia Regional Energy Agency (REGEA). As the meeting was leaned to the kick-off event in Croatia with the same participants, all participants were already at the meeting acquainted with the general information about the Store4HUC project: programme Interreg Central Europe, Programme priority and specific objective, information about project partners, project duration, pilots and work packages. The meeting was organized as an open discussion where the planned interventions on Bračak Manor were first explained from the investment point of view (REGEA) as well as the energy management and IT point of view (UNIZGFER). After that it was discussed about pilot site Bračak implementation with focus on potential technical, conservation and economic barriers linked to pilot action in Croatia.

2. Date and place

Deployment desk meeting was held on September 16, 2019 at the pilot site of the Bračak Manor (Energy Centre Bračak), Bračak 4, 49210 Zabok, Croatia.

3. Number and types of participants/target groups

The meeting was attended by 21 people in total.

- Owner of Bračak Manor (Krapina-Zagorje County) representatives: one person
- Ministry of Construction and Physical Planning authorities: four persons
- Cultural heritage preservation authorities: two persons
- HUPG representatives: one person
- Infrastructure and (public) service provider – HEP Distribution System Operator: one person
- Sectoral agency: one person
- Pilot site users (employees of REGEA on the pilot site): four persons
- Local pilot experts from REGEA: four persons
- energy management tool developers – UNIZGFER representatives: three persons
-

4. Topics tackled

In the first part of the Deployment desk meeting, through the ppt presentation the stakeholders were provided with the information and planning related to the Croatian pilot site project where it is planned to add a properly sized photovoltaic system and battery storage to it (up to 10kWp and 10kWh). Also, it was discussed about energy management ICT system that will be built on top of the already existing central monitoring system as a coordination service that optimally exploits different available assets. Also, the discussion was guided in order to answer some previously identified issues by the Store4HUC consortium, common for the whole Central Europe, or regional/local issues.

4.1. Suggested questions

First topic: General questions about EMS and storages in HUCs

international:

- What are the problems on EMS and energy storage planning in HUCs in your Croatia/Bračak?

The problems in implementing EMS and energy storage planning in HUC in North-west Croatia are:

- strict conservation rules, and slow administration,
- lack of interest due to increased investment.

- What experiences do your external stakeholders have with this topic?

In an open discussion, during the deployment desk meeting, we found out that stakeholders have experience in implementing photovoltaic systems with battery storages, and they are also familiar with the possibilities of integrating different assets into a central monitoring system but not in implementing such systems in HUC, so they think this pilot project is a great opportunity to gain extra knowledge and experience.

- Are there already some other best practice examples?

In Croatia there are very few examples of good practice, but as an example is recognized Spiritual Education Center Mary's Palace near Zaprešić, and Bračak Manor which is the pilot building on Store4HUC project.

Second topic: Pilot specific technical/legal framework conditions

international:

- Short explanation of the targets of your underlying energy concept/plan. Have the various stakeholders agreed on these objectives?

Within the pilot site Bračak it is planned to add a properly sized photovoltaic system and battery storage to it (up to 10 kWp and 10 kWh). The already existing systems will be combined with the new ones through an advanced energy management ICT system that can be built on top of the already existing central monitoring system as a coordination service that optimally exploits different available assets. The introduced energy management system will inherit the preview projects (3Smart) in which its modular parts for in which its modular parts for central HVAC system level management of heat production via micro CHP and wood pellets boiler and heat storage will be combined with the photovoltaic and battery system introduced on the top-level (microgrid-level) of the pilot site operation. All stakeholders agreed on these objectives. Furthermore, the usage of IT and energy management to best exploit the assets installed was found very needed for HUCs in order to keep the physical interventions as minimal as possible for the targeted performance at the end.

- Are there any critical issues regarding to the cultural heritage protection?

So far, we have not identified any critical issues regarding to the cultural heritage protection. It is clear that the photovoltaic system cannot be attached directly to the building and its positioning in the manor surrounding was discussed where a car pot was agreed as a good position for it.

- What are good KPIs for the pilot plant?

Good Key Performance Indicators for the pilot action in Croatia are direct savings on electricity bills, Increasing the use of RES and reducing CO2 emissions, Increasing energy independence.

national / pilot specific issues

- Short description of the energy management tool. What do your stakeholders think about the EMS concept in particular?

The pilot site in Bračak is an example of a historical urban site where recently significant integration and refurbishment efforts have been already done, making it already now a site with class A energy certificate. Energy management tool will plan optimal operation of the installed battery energy storage system with photovoltaic system, operation of the combination of wood pellets boiler and micro Combined Heat and Power (CHP) plant and the remaining HUC energy relevant systems. Stakeholders are enthusiastic about the idea of EMS concept. They like the way we plan to monitor and predict energy consumption and production in the Bračak Manor through the central building management and control system, as well as to manage heat production assets, heat storage and battery storage to gain optimum performance in accordance with KPIs listed above.

Third topic: Pilot specific social/political aspects

international

- Who are the main actors and how are they connected?

Main actors are representatives of the Krapina-Zagorje County, Conservation Office in Krapina, Croatian electricity distribution system operator (HEP-ODS), Ministry of Construction and Physical Planning, Zagorje Development Agency (ZARA), Croatian Association of Historic Towns (HUPG) and their field of work is not closely connected but they collaborate institutionally on different projects.

- What will be the benefits for the citizens, respective end-users / for the municipality / for the surrounding neighbourhood?

Bračak Manor is a public building open to all citizens, respective end users and it is used as a central place for organizations, companies and institutions interested in renewable energy as well as for small and medium companies from other sectors. The main objective of the energy centre located in Bračak Manor is continuing education, exchange of experience and information to all stakeholders on the sustainable use of energy, so this will continue in the future.

national / pilot specific issues

- What do your stakeholders think about the replication of the concept in Bračak?

Stakeholders recognized the Bračak Manor as an excellent example of how-to energy refurbish a cultural heritage building in accordance to best energy efficiency practices and use of renewable energy sources, and they agree that the practice should be replicated to other HUC buildings. In that respect, Ministry of Construction and Physical Planning wanted to be closely informed about the further developments both on the Croatian pilot and also on the other Store4HUc pilots since they are in a process of drafting technical regulations for energy renovation of protected sites and clear performance figures and practical examples are very important to them now.

- Would for example an installation like this also be possible in the HUC of Zagreb?

Such an installation could certainly be replicated in the HUC of Zagreb.

- Is it easy to get the permits for PV installations in HUCs in Croatia?

Obtaining permission to install photovoltaics installations in Historical urban sites in Croatia depends on various factors. Most important factor are Conservation permits, because the design solution of PV must not disturb the exterior view of the building. Since protected buildings differ in size and shape, conservation requirements may vary from building to building or site to site.

5. Implemented actions and links to deliverables, outputs

We have approached stakeholders by contacting them by e-mail and phone. For the first Deployment desk meeting we provided roll-up as a promotional project material. This deliverable relates also to D.T1.1.1 deliverable which outlines the deployment desks concept on Store4HUC.

6. Results, effects and the response

The most important achievement of the first Deployment desk meeting in HR is that we have brought together in one place all the relevant institutions and organizations needed to properly discuss open questions and potential obstacles that we could potentially encounter during implementation of the pilot in Bračak Manor. The stakeholders especially liked the fact that we gave them the opportunity to be actively involved in the implementation of the project and the way we approached them, which is confirmed by anonymous feedback on an anonymous questionnaire that we shared after the meeting. After the meeting, we collected a total of 17 feedback forms.

Statistic from anonymous feedback forms:

Registration process	98,82% satisfied stakeholders
Location	100% satisfied stakeholders
Venue	100% satisfied stakeholders
Drinks	100% satisfied stakeholders
Food	100% satisfied stakeholders
Presenters	100% satisfied stakeholders
Hygiene	100% satisfied stakeholders
Content	98,82% satisfied stakeholders
How would you generally rate the meeting	100% satisfied stakeholders

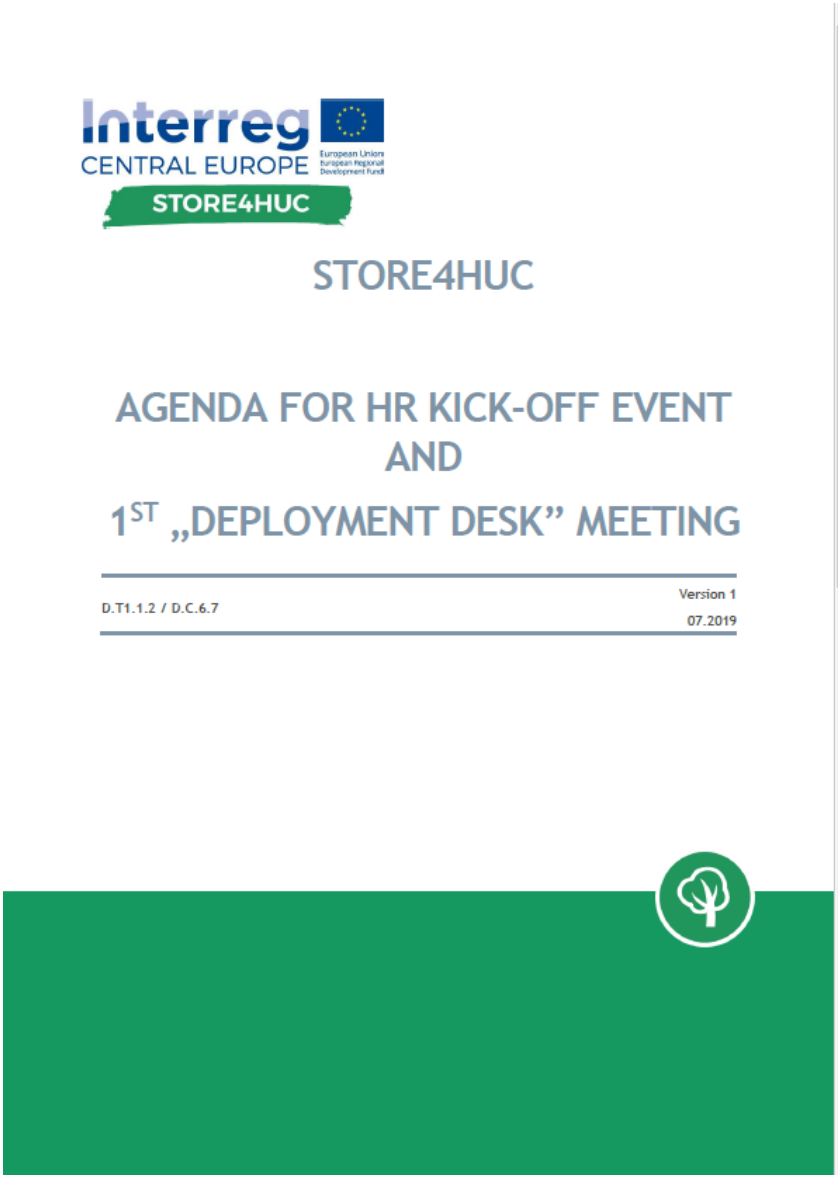
7. Conclusion

By establishing the stakeholder deployment desk, we will reach the relevant players to share the knowledge and transfer it to other additional audience. First Deployment desk meeting was held on 16 September 2019, at the location of Bračak Manor - location of the Croatian Store4HUC pilot. At the meeting were invited all relevant stakeholders, to inform them about the planned pilot action and to receive feedback from them. The meeting was attended by representatives of the Krapina-Zagorje County, Zagorje development agency, Ministry of Culture of the Republic Croatia – Conservation office in Krapina, Ministry of Construction and Physical Planning, Croatian Association of Historic Towns, University of Zagreb Faculty of Electrical Engineering and Computing, and North-West Croatia Regional Energy Agency. After the initial presentation of the project performed within the kick-off event leaned to the deployment desk meeting, the stakeholders were introduced to the pilot project Bračak and were explained what is planned through the project. After that, a discussion was opened to identify technical, economic and conservation barriers related to the implementation of energy efficiency measures and renewable energy sources and energy storages in Historical urban centres in Croatia. The discussion was of an open character where stakeholders presented separately their views while focusing on their area of expertise.

8. Annexes

8.1. Invitation and Agenda

Agenda



STORE4HUC

AGENDA FOR HR KICK-OFF EVENT
AND
1ST „DEPLOYMENT DESK" MEETING

D.T1.1.2 / D.C.6.7

Version 1
07.2019

Inicijalno predstavljanje projekta Store4HUC u Hrvatskoj (HR kick-off) i prvi sastanak dionika pri provedbi investicije u spremnike energije na zaštićenoj lokaciji dvorca Bračak (HR deployment desk meeting)

Datum: 16. rujna 2019.

Lokacija : Energetski centar Bračak - dvorac Bračak; Bračak 4

Vrijeme: 12:00 h

Terminski plan događanja

Inicijalno predstavljanje projekta Store4HUC

- 12:00: Doček sudionika ispred dvorca Bračak
- 12:10: Pozdravni govor domaćina (REGEA)
- 12:20: Kratka prezentacija projekta Stoe4HUC (FER)

Croatian deployment desk meeting No. 1

- 12:40: Upoznavanje sudionika s temama i ciljevima HR deployment deska (REGEA)
- 13:00: Prezentacija - Investicije u sklopu projekta Store4HUC (FER)
- 13:20: Obilazak uz prezentaciju - Pilot projekt Bračak (REGEA)
  - Ugradnja fotonaponskog sustava kraj dvorca Bračak (REGEA i FER)
  - Ugradnja baterija za skladištenje energije dobivene putem fotonaponskih ćelija u dvorcu Bračak (REGEA i FER)
  - Integracija fotonaponskog i baterijskog sustava u postojeći pametni sustav upravljanja zgradom (REGEA i FER)
- 13:45 Fotonaponska elektrana na krovu Opće bolnice Zabok (REGEA)
- 13:50: Pitanja i odgovori
- 14:00: Druženje uz ručak

Page 1

8.2. Presentations from the event

Themes and goals of HR deployment desk and general information about the Croatian pilot and its initial state:

Pilot action with focus on energy management and its related IT:

8.3. List of participants

List of participants

Inicijalno predstavljanje projekta Store4HUC u Hrvatskoj pri provedbi investicije u spremnike energije na zaštićenoj lokaciji dvorca Bračak (HR deployment desk meeting)

Datum: 16. rujna 2019.
Lokacija: Energetski centar Bračak - dvorac Bračak; Bračak 4
Vrijeme: 12:00 h

"Osobne podatke koje REGEA i Fakultet elektrotehnike i računarstva, Sveučilište u Zagrebu prikupljaju na potpisnim listama prikupljaju se dana 16.9.2019. od 11 do 15 sati u svrhu provedbe projekta pod nazivom Store4HUC, odnosno, u svrhu evidencije i dokaza broja sudionika na prvom radnom sastanku (HR deployment desk meeting, HR kick-off), slijedom čega se isti neće upotrebljavati za niti jednu drugu svrhu osim ovdje navedene, te se isti neće dostavljati bilo kojim trećim osobama u Republici Hrvatskoj i/ili inozemstvu."

"Svi sudionici radnog sastanka projekta Store4HUC dana 16.9.2019. od 11 do 15 sati mogu biti fotografirani za potrebe vidljivosti, a fotografije mogu biti korištene za potrebe slanja priopćenja za medije, za potrebe objava na društvenim mrežama, te u druge reklamne i/ili promidžbene svrhe. Fotografiranje će obaviti Matija Hrupački i Kristijan Skoc. Ako ne želite biti na fotografiji, odnosno, ako ne želite da se Vaša fotografija koristi za potrebe slanja priopćenja za medije i/ili objave na društvenim mrežama i/ili u druge reklamne ili promidžbene svrhe molimo da se obratite na mail ibelic@regea.org."

Regionalna energetska agencija Sjeverozapadne Hrvatske i Fakultet elektrotehnike i računarstva, Sveučilište u Zagrebu postupaju u cijelosti u skladu s odredbama UREDBE (EU) 2016/679 EUROPSKOG PARLAMENTA I VIJEĆA od 27. travnja 2016. godine o zaštiti pojedinaca u vezi s obradom osobnih podataka i o slobodnom kretanju takvih podataka te o stavljanju izvan snage Direktive 95/46/EZ (Opća uredba o zaštiti podataka).

Potpisna lista

[redacted]

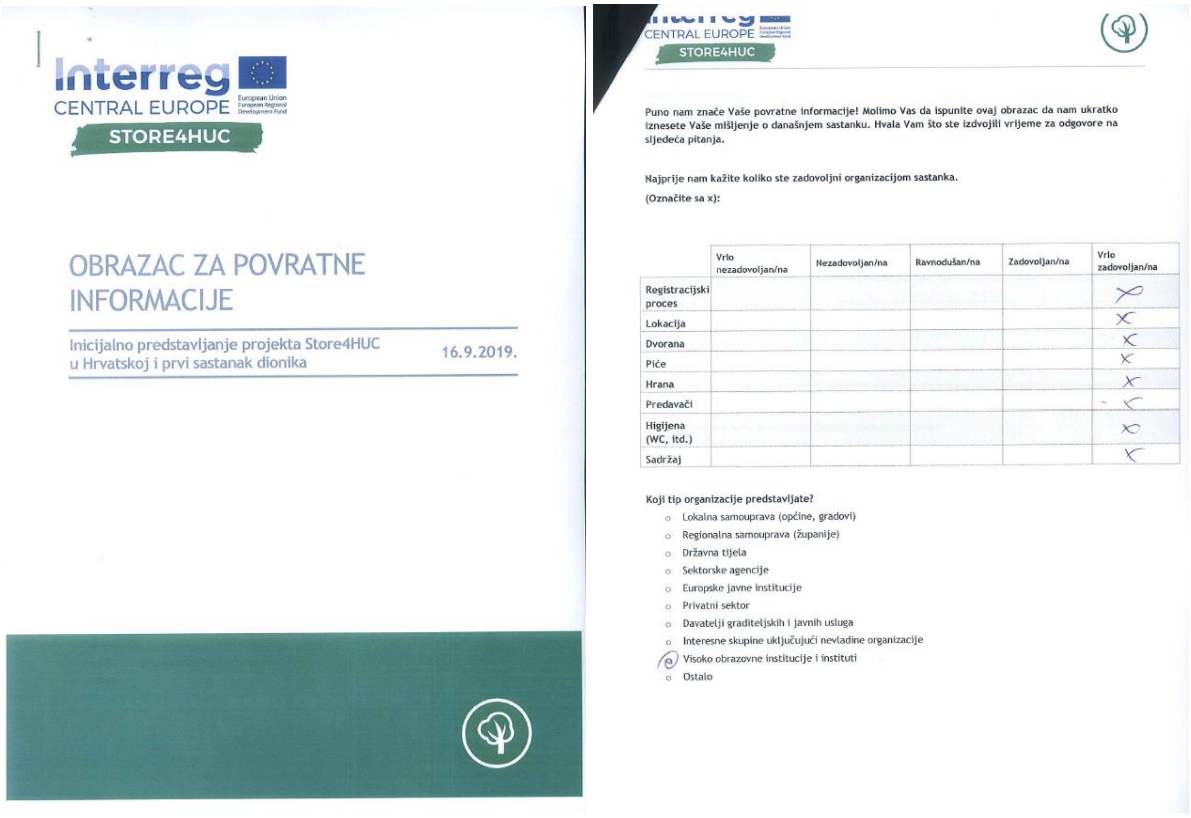
[redacted]

8.4. Pictures

Figure 1: Deployment desk meeting - presentation

Figure 2: Deployment desk meeting - presentation

8.5. Feedback form



Interreg CENTRAL EUROPE STORE4HUC

OBRAZAC ZA POVRATNE INFORMACIJE

Inicijalno predstavljanje projekta Store4HUC u Hrvatskoj i prvi sastanak dionika 16.9.2019.

CENTRAL EUROPE STORE4HUC

Puno nam znače Vaše povratne informacije! Molimo Vas da ispunite ovaj obrazac da nam ukratko iznesete Vaše mišljenje o današnjem sastanku. Hvala Vam što ste izdvojili vrijeme za odgovore na sljedeća pitanja.

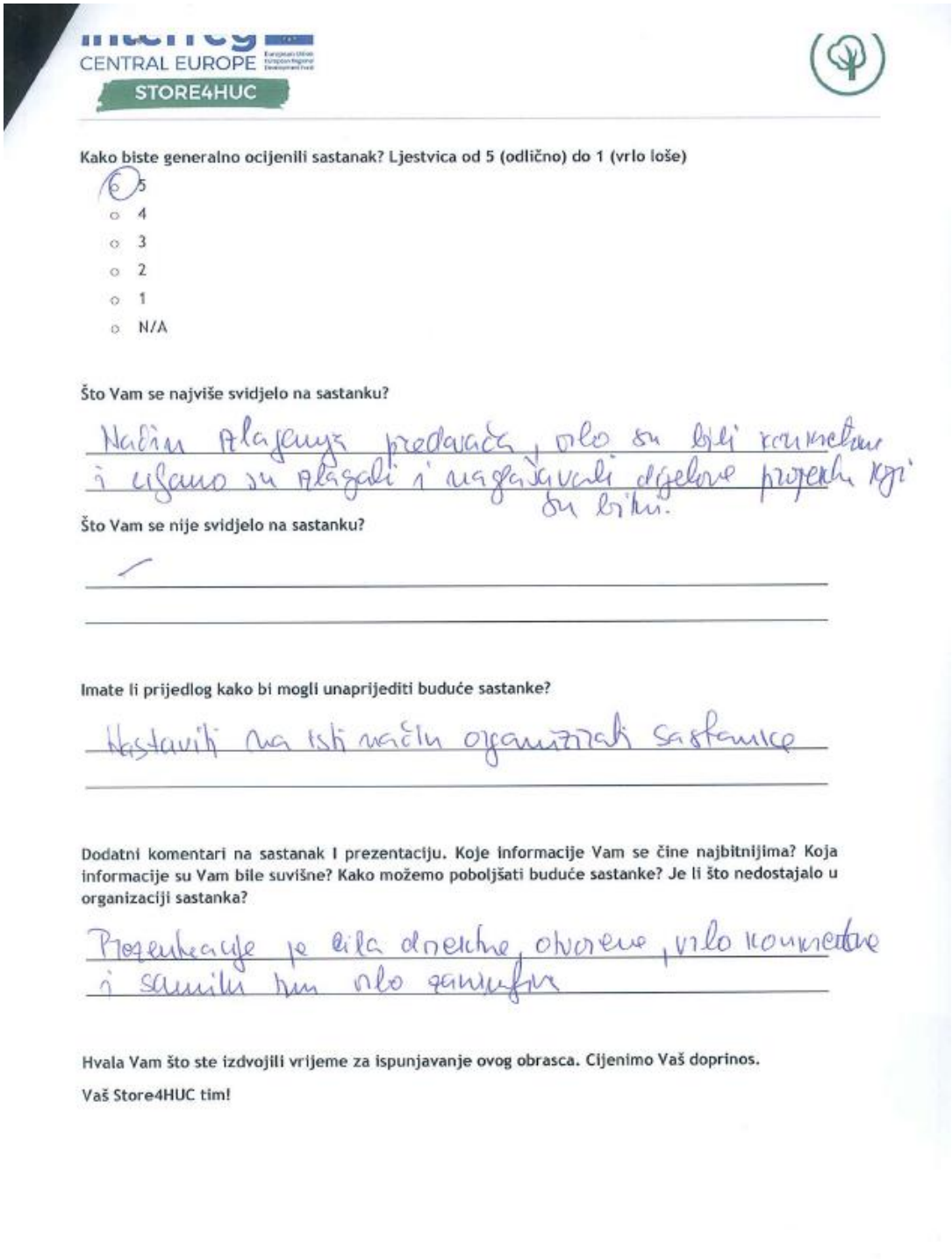
Najprije nam kažite koliko ste zadovoljni organizacijom sastanka.

(Označite sa x):

	Vrlo nezadovoljan/na	Nezadovoljan/na	Ravnodušan/na	Zadovoljan/na	Vrlo zadovoljan/na
Registracijski proces					✓
Lokacija					X
Dvorana					X
Piće					X
Hrana					X
Predavači					X
Higijena (WC, itd.)					X
Sadržaj					X

Koji tip organizacije predstavljate?

- o Lokalna samouprava (općine, gradovi)
- o Regionalna samouprava (županije)
- o Državna tijela
- o Sektorske agencije
- o Europske javne institucije
- o Privatni sektor
- o Davatelji graditeljskih i javnih usluga
- o Interesne skupine uključujući nevladine organizacije
- ✓ Visoko obrazovne institucije i instituti
- o Ostalo



CENTRAL EUROPE

STORE4HUC

Kako biste generalno ocijenili sastanak? Ljestvica od 5 (odlično) do 1 (vrlo loše)

- (5)
- 4
- 3
- 2
- 1
- N/A

Što Vam se najviše svidjelo na sastanku?

Način izlaganja predavača, oni su bili koncretni i ciljano su izlagali i naglašavali dijelove projekta koji su bitni.

Što Vam se nije svidjelo na sastanku?

/

Imate li prijedlog kako bi mogli unaprijediti buduće sastanke?

Nastaviti na isti način organizirati sastanke

Dodatni komentari na sastanak I prezentaciju. Koje informacije Vam se čine najbitnijima? Koja informacije su Vam bile suvišne? Kako možemo poboljšati buduće sastanke? Je li što nedostajalo u organizaciji sastanka?

Prezentacije je bila dinamične, otvorene, vrlo konkretne i sadržaju ima vrlo zanimljiva

Hvala Vam što ste izdvojili vrijeme za ispunjavanje ovog obrasca. Cijenimo Vaš doprinos.

Vaš Store4HUC tim!

8.6. Media coverage

Link: https://www.zagorje-international.hr/index.php/2019/09/18/odrzan-prvi-u-nizu-sastanaka-jedan-od-ciljeva-je-i-nova-investicija-na-dvorcu-bracak/

Figure 3: Article published in local newspaper

8.7. Web-links

Link to the announcement published by the REGEA official Facebook page during the meeting

Link: https://www.facebook.com/regeaSZhr/posts/3036856046455105

DOCUMENTATION ON DECISIONS OF 1ST „DEPLOYMENT DESK" MEETING **AUSTRIA**

D.T1.1.2

Version: final
10 2019

Title	Documentation on decisions of 1st “Deployment Desk” Meeting in Austria
Deliverable	D.T1.1.2
Authors	Andrea Dornhofer, Rafael Bramreiter, Alois Kraußler, Robert Pratter, Reiterer & Scherling
Contributors	
Status	final
Reviewed by	
Submission	

Content

1. Summary

The focus of the demonstration site will be on the integration of a thermal storage for the church on Weizberg, which is connected to a small public district heating grid. For the local deployment desk 14 stakeholders have been identified in a first stage. In the kickoff meeting in total 10 stakeholders (4 internal stakeholders, who are already part of the project team; 6 external stakeholders, mostly local authorities or members of the biomass network) participated. In the second deployment desk meeting in September 9 stakeholders have attended. Within this meeting the procedure of implementing the storage system and also the historical protection issues were discussed. Additionally, the timeframe of the implementation phase and some financing issues are discussed. The funding of the storage system is not part of the project and is done with the help of external resources.

2. Date and place

In Weiz more deployment desk meetings than specified in the proposal are planned. That is why already two deployment desk meetings have taken place until now. The deliverable summarizes the results of both meetings.

- 14th of June, 7 pm
- 11th of September, 8 am
- Weiz, Gasthof Ederer, Weizberg 2, 8160 Weiz

3. Number and types of participants/target groups

The first meeting was attended by 10 participants, 4 internal and 6 external ones

[redacted]

The second meeting was attended by 9 participants, 3 internal and 6 external ones

- Johann Haas

4. Topics tackled

The main scope of the present deployment desk meeting was to design the solutions (storage system implementation and energy savings for the parish church of Weizberg) together with the involved stakeholders. The procedure backgrounds and targets of the deployment desk were also shown and discussed.

The obtained storage solutions and energy saving actions requires the active involvement of all members of the deployment desk. Another important task of the deployment desk was the definition of the monitoring of the actions, which will be implemented. It should be decided within the meetings of the deployment desks, how to create one or more workshops of practical nature, mostly addressed to municipal employees, biomass heating members, or technicians. The aim of the workshops is to present the measures which have been implemented in the participating regions (especially in the pilot of Weiz) and on the other hand to improve the cooperation between those regions in order to exchange experiences and good practice examples.

4.1. Suggested questions

First topic: General questions about EMS and storages in HUCs

international:

- What are the problems on EMS and energy storage planning in HUCs in Austria/Weiz?

HUCs are in Austria subject to the building and spatial planning laws of the provinces and the Austrian Historic Buildings Acts. Protection of the local historic sites and historic buildings is guaranteed by respective local historic buildings protection zones, which is executed by a local historic building expert within the framework of building approvals. Structural changes according to the respective zoning plan, as for example in Weiz, therefore requires a building licence including a positive local landscape protection evaluation

- What are the needs on EMS and energy storage planning in HUCs in Austria/Weiz?

The Weizberg heating plant, as a pilot and best practice plant for Austria, was built below the existing site level due to the requirements for buildings within a HUC. The planned extension to accommodate a storage, a machine room, a control room, a retaining wall as well as the associated changes in terrain thus have a direct impact on the existing landscape. Therefore, the following requirements and needs have to be fulfilled locally and also nationally due to the approval situation:

(1) Mostly implementation below terrain and surface level,

(2) utilization of existing buildings to cover the extension and associated restrictions regarding the dimensions of the new building,

(3) specially adapted design of the visible facades with regard to colour and geometry while complying with the requirements for weather resistance,

(4) minimally invasive integration, in order not to influence existing natural conditions such as trees and bushes.

- What are the opportunities on EMS and energy storage planning in HUCs in Austria/Weiz?

Creative, intelligent and "smart" solutions are currently in demand at local and regional level in order to be able to supply those buildings or urban districts that are protected as historical monuments or townscapes with renewable energy sources and to optimise them in terms of energy efficiency in the future, particularly at local, national and transnational level. Such a local, national and European best-practice solution would be the innovative use of a thermal energy storage system within the monument or heritage protection zone of the Weizberg Basilica.

The pilot plant biomass heating plant Weizberg already offers a CO_2 neutral and 100 % renewable heat supply with wood as energy source. However, the plant is currently inefficient due to a lack of thermal energy storages. More wood is burned than necessary and the locally limited land consumption and life cycle footprint is considerably higher than necessary.

The integration of a thermal energy storage into the existing heating plant can counteract this and contribute to a more efficient use of resources and land. In addition, the use of regional forest chips by regional farmers ensures that the added value remains in the country or region.

- What experiences does your external stakeholders have with this topic?

The heating plant has been in operation since 1999, which is why the individual project partners have many years of specialist experience. Within the framework of the project, the following four stakeholders in particular were identified as central knowledge carriers:

(1) Biomass heating plant Weizberg reg. cooperative mbH

Role: Owner and operator of the local heating network

Founded in 1999 and built the Weizberg biomass heating plant. Has been operating the biomass heating plant for 20 years now with the help of 24 innovative farmers.

(2) Technical office Ing. Haas Ges.m.b.H.

Role: Executing HLKS company

Active in the HLKS industry since 1982. Many years of experience in the construction, operation and maintenance of biomass local heating networks. Since the beginning of 1999 responsible for operation, maintenance, repair and expansion projects of the Weizberg biomass heating plant.

(3) W.E.I.Z - Weizer Innovation Centre:

Role: PP3 Store4HUC - regional responsible PP

The Weizer Energie- Innovations-Zentrum GmbH (W.E.I.Z.) as a regional contact point for the main topics "Energy" and "Innovation" is an important initiator for the economic structural change in the region of Eastern Styria. As a network-oriented partner for economic development, the W.E.I.Z. is now known beyond the region as a contact point for sustainable activities, especially in the areas of "ecological building & living, energy efficiency and renewable energies". Focal points include energy innovations in the areas of waste heat recovery from industrial plants, CHP based on biomass (wood gasification, electric generators), as well as the development and promotion of regional energy concepts - energy analyses (national and international projects: MultiTransfer, PEACE_Alps. SoWeiTconnected, WEIZconnected; CitiEnGov, SUI, SynEnergie, Quick Bio Net, etc..)

(4) AEE INTEC - Institute for Sustainable Technologies

Role: Advisory Research Institute

AEE - Institute for Sustainable Technologies (AEE INTEC) is an independent research institute in the field of renewable energies and resource efficiency. Since its foundation in 1988, the institute has developed into one of the leading European institutions for applied research in this field. The group "Thermal Storage" has been involved in a large number of national and international projects with a focus on energy storage (EU project: CREATE, SCORES, COMTES; National flagship projects: giga_TES, Tes4seT; IEA SHC Tasks and IEA ECES Annexes). In particular, the design, development and demonstration of components for thermal energy storage systems can be considered as expertise.

- Are there already some other best practice examples?

The building W.E.I.Z. 4 is a customized research house for the Institute of "Materials" of the JOANNEUM RESEARCH Forschungsgesellschaft m.b.H. The building was successfully realized as part of the Smart City lead project **iEnergy 2.0**. The plus energy house uses the operational waste heat of the research laboratories (energy index 12 kWh/m²a) and generates enough electricity for the electrical self-sufficiency of the building services via a 30 kWp photovoltaic system. The system was installed by the regional energy supplier Energie Steiermark GmbH as a green electricity plant by means of plant contracting. Currently buildings with a photovoltaic system have hardly any stationary electricity storages and offer even less cross-building photovoltaic electricity. In order to continue using photovoltaic electricity economically, low green electricity tariffs require not only a high use of own electricity, but also the possibility to offer the energy-surplus directly to other customers or to feed it into a daily storage. This multiple utilization system for photovoltaic electricity with maximum own electricity utilization will be realized within the framework of the **WEIZconnected** project with the buildings W.E.I.Z. 2 and W.E.I.Z. 4. The technical, economic and legal (ElWOG) system solution will be demonstrated as a pilot plant at the W.E.I.Z. Innovation Centre. W.E.I.Z. also deals with issues relating to energy management systems. In the various implementation and research projects, several energy monitoring systems have been developed and/or implemented in order that the consumption and production of energy can be monitored. Knowing how much energy is needed is important for the Weiz site. Therefore, a **smart meter system** for the power consumption of the W.E.I.Z. 4 was installed to make it visible.

Another example is the **MULTI-transfer** project, in which innovative control and operating strategies for a bidirectional heat transfer station were developed. Because of the decentralization of the heat production in district heating grids, more and more consumers want to act as prosumers and feed their surplus heat into the district heating grid. Up to now, two transfer stations have always been required for such cases, one for the heat consumption and one for the heat supply. In this project, a bidirectional heat transfer station was developed, which can be transferred heat in both directions. The functionality of the innovative heat transfer station could be reviewed by laboratory tests and simulation studies.

Second topic: Pilot specific technical/legal framework conditions

international:

- Short explanation of the targets of your underlying energy concept/plan. Have the various stakeholders agreed on these objectives?

The parish church of Weizberg, which is under monumental protection, is connected to a district heating grid with a heating load of about 220 kW. The heating station with its four separate transformer stations is located close to the church as shown in Figure 1. Only regional biomass is used as fuel. In course of the project Store4HUC, a storage, new regulations, heat exchanger, thermostatic valves and a monitoring system will be installed.

Figure 1. Location of the heating station where the storage will be installed

Furthermore, the comfort in the individual rooms should be increased. Through the installation of a building management system, visualisations and the continuous recording of measured values, the plants should be able to be optimized in retrospect by evaluating this "historical data". Moreover, the reduction of the return temperature to the biomass district heating is also a target, and if it is possible a new thermal storage with a volume of about 38 m^3 will be installed. In Figure 2 a schema of the implementation of the planned storage is shown.

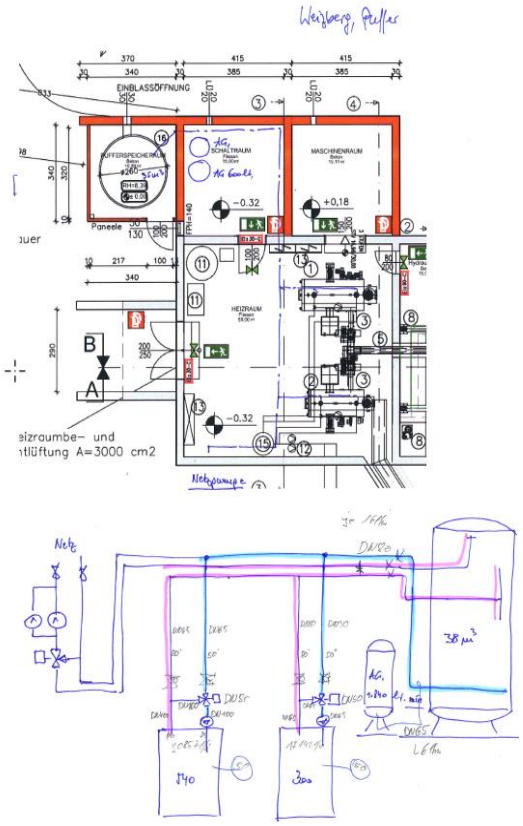


Figure 2: Scheme of the district heating station

The biomass heating plant Weizberg has been operated by 24 innovative farmers for 20 years (founded in 1999). Through the use of regional wood chips, the added value remains in the region. The heating plant supplies a total of twelve objects on the hill of Weizberg, including the elementary school as well as some commercial enterprises and residential buildings. Using renewable energy, the guiding principle of the farmer cooperative "Energy from the region for the region" is completely fulfilled in regard to the following rough figures:

- Heat consumption: Max. 812 kW / 1.200 MWh/a
- Wood chips consumption: About 1.500 loose cubic metre per year (100 % wood chips from regional farmers)
- Heat plant: 300 kW and 540 kW biomass boilers with rotation combustion

The stakeholders have agreed on these objectives.

- If not, what are their points?

  -

- Are there any critical issues regarding to the cultural heritage protection?

As already mentioned, there are numerous local, regional and national laws that must be observed with regard to cultural heritage protection in Austria. Structural measures are not allowed to lead to changes in the landscape. This is why the following points are relevant with regard to cultural heritage protection and hence buildings have to implemented as follows:

(1) Mostly implementation below terrain and surface level,

(2) utilization of existing buildings to cover the extension and associated restrictions regarding the dimensions of the new building,

(3) specially adapted design of the visible facades with regard to colour and geometry while complying with the requirements for weather resistance,

(4) minimally invasive integration, in order not to influence existing natural conditions such as trees and bushes.

- What are good KPIs for the pilot plant?

  KPI 1: Profitability i PI= NPV/I (Net Present Value (NPV) includes factors such as inflation, interest, equity and borrowed capital and all relevant costs that are associated with the investment over its overall lifetime (e.g. O&M costs, capital-related costs, reinvestments, etc.), and energy savings, which take into account the timing components of such savings.

  KPI 2: Reduction in Energy delivered per capita (comparative analysis of the status before and after realisation).

  KPI 3: Average yearly Emission abatement (with respect to the same reference value e.g. 2010 over the application life cycle)

  KPI4: Autarky rate in days (enhances the energy self-sufficiency of HUC).

  KPI 5: Stimulation of the local economy (New added value brought to the local economy and consequently potential number new business and trainings and jobs created (net)).

In particularly with regard to KPI 3 and the fact that the existing parts of the pilot plant are a CO_2 neural biomass heating plant operating with 100 % renewables, basically no CO_2 savings are possible, but under the assumptions of Table 1 it can be shown that CO_2 savings and savings of other emissions are possible through the integration of a storage.

Essentially, due to the planned measures of load balancing and peak load coverage, the disadvantageous partial/weak load operation of the boiler plant is avoided or reduced and thus the following positive effects are achieved:

- Increasing the efficiency of the fuel boilers → Savings in primary energy (fuel savings) → CO_2 savings through lower energy expenditure for the provision of the wood chips (production, transport, etc.)
- Lower pollutant emissions (carbon monoxide (CO), dust, NOx and volatile organic carbon compounds (CnHm))
- Increasing the service life of the plant components → Significant saving of ecological resources that would result from early complete renewal of the boiler plant.
- Increase in sweeping intervals (due to on/off operation of the boiler system, more time windows are available → Increase in efficiency, reduction in pollutant emissions
- Extension of maintenance intervals → Lower maintenance costs
- More dynamic operation of the local heating network possible → Consumers can be served more quickly with the required flow temperature
- In addition, the use of the heating network as a thermal buffer is avoided as a result of the central storage in the heating plant and the associated increased heat losses are reduced.

- Table 1: Calculated fuel and pollutant savings

		Before	After
Amount of fuel	[MWh]	1.781,76	1.688,19
Savings	[MWh]	93,56	
	[%]	5,25	
Amount of fuel	[srm]	1.869,10	1.770,95
Savings	[srm]	98,15	
	[%]	5,25	
Reduction of CO_2 equivalent emissions[1]	[t/a]	1,50	
Reduction of pollutants[2]			
- **CO**	[kg/a]	294,89	
- **NO_x**	[kg/a]	43,28	
- **Staub**	[kg/a]	27,28	
- **C_nH_m**	[kg/a]	59,62	
Theoretical CO_2-Reduction[3]	[t/a]	29,10	

national:

- What is the opinion of the stakeholders about the chosen storage solution?

All of the biomass members are satisfied with this solution. As there had already been discussions with most of the stakeholders before the official project kick off, it was already largely possible to agree on the present approach.

- Would a latent heat storage also be an option (comparison with Lendava)?

We discussed about storages in general and about different types of storages:

Heat storage are storage for thermal energy (energy storage). A distinction is made between storage for sensible heat, latent heat storage and thermochemical heat storage. Heat storage can be built in different sizes, ranging from decentralized small systems to large central storage. They are available both as short-term as well as seasonal storage and can depending on the design and absorb low-temperature heat for space heating or high-temperature heat for industrial applications. In addition to the storage of thermal energy is the most important goal of heat storage is to decouple the generation and use of heat in time.

[1] Saved emission for the provision of the wood chips (production, transport, etc.); calculation basis: CO2-equivalent emission factor=16 g/kWhEE(Bst.); mean value of the emission factors from [1], [2] and [1], after the emission factors from the literature show very high ranges of fluctuation.

[2] Saved emissions due to fuel savings; calculation basis: CO=3.15 g/kWhEE(Bst.), NOx=0.46 g/kWhEE(Bst.), dust=0.29 g/kWhEE(Bst.), CnHm=0.64 g/kWhEE(Bst.); mean values of the emission factors for Austria and Germany from [1].

[3] Is the CO2 saving which would result from the lower fuel consumption if the saved fuel were evaluated with the CO2-equivalent emission factor of heating oil, with the assumption that the peak load coverage of the heating plant could not be provided by a storage tank but by an oil boiler or that the saved biomass of this heating plant could substitute the fuel of another fossil-fired heating plant. Calculation basis: CO2-equivalent emission factor=311 g/kWhEE(Bst.) from [2].

Types of heat storage

1. Sensible heat storage

They change during charging or discharging their "tactile" temperature, e.g. Buffers. The heat capacity is the most important parameter for sensitive storage materials. Since this type does not undergo phase transitions, it can be used over a wide temperature range, especially in the high temperature range.

2. Latent heat storage

They do not change their "sensible" temperature when charging or discharging, but the heat storage medium changes its state of aggregation. This is usually the transition from solid to liquid (or vice versa). The storage medium can be loaded or unloaded beyond its latent heat capacity, which only leads to an increase or decrease in temperature.

3. Thermochemical heat storage or sorption storage

They store the heat with the help of endo- and exothermic reactions, e.g. As with silica gel or zeolites.

In addition, it is still possible to distinguish between open, built into the ground so-called aquifer storage and the usual container designs

We had a lot of discussions with the planning company regarding to the best storage solution and came to the result that a latent heat storage would be to expensive in our case. The final decision, that it will be a thermal water storage was made by the owner of the biomass heating network and the planning company.

- **Third topic: Pilot specific social/political aspects**

  international

- Who are the main actors and how are they connected?

The following tables shows the time-wise stakeholder cooperation, and the tasks for each of them. The identified stakeholders have been summarized in groups with similar activities. The tables (Table 2 to Table 7) will be used as living document for the future deployment desks, which means that they will be updated during the project time. As far as they are already known the planned activities are listed.

Table 2: Stakeholder 1: WEIZ (employees of WEIZ)

Actions	
1.	Establish of feasibility study
2.	Organization of deployment desk meetings
3.	Lead the implementation process, local support
4	Support within the implementation of actions

Table 3: Stakeholder 2: 4ward Energy (employees of 4ward Energy)

Actions	
1	evaluate self-sustainability of different pilot options in the pilot preparatory phase – together with WEIZ
2	providing other consulting services – support of WEIZ

Table 4: Stakeholder 3: Technicians (Gerald Hutter, Varicon Günther Grabner (Iplan))

Actions	
1.	technical organization in terms of energy management; regularly
2.	checking with WEIZ and the regional actors the installations progress and perform final verification
3	Approve the planned investments within the project after the planning phase is finished

Table 5: Stakeholder 4: local authorities in reach of WEIZ, cities and municipalities representatives from Weiz, Thannhausen and Almenland

Actions	
1.	knowledge transfer of the pilot to make it relevant also for other sites

Table 6: Stakeholder 5 members of the biomass network

Actions	
1.	knowledge transfer of the pilot to make it relevant also for other sites
2.	Investor of the measures and the storage

Table 7: Stakeholder 6 researcher and biomass experts (AEE INTEC)

Actions	
1.	Feasibility study
2.	Pre investment concept
3.	providing other consulting services based on experience from investments in historical urban centers

Technicians of technical offices (Günter Grabner, Gerald Hutter, and Johann Haas) are regional experts in planning of biomass storages, EMS Systems and energy efficiency measurements. They will gain extra knowledge, and experiences in implementation of renewable energy systems and storages in the envisaged historical urban area.

Other Styrian cities and municipalities will be educated about the benefits of energy efficiency and the use of renewable energy sources as well as on storages in buildings under cultural heritage protection. The pilot will provide a good showcase to the local authorities which will also benefit in sense of improved energy efficiency, increased usage of renewable energy sources and lower costs for energy.

The members of the biomass district heating systems will be educated how to enable further development of projects dedicated to renewable energy sources on other cultural heritage buildings and will gain knowledge about possible technologies of district heating networks.

- How effectively policy development and implementation is integrating relevant economic, social, energy and environmental aspects?

As the Store4HUC project shows, the integration of relevant economic, social, energy and environmental aspects is very effective. The integration of these aspects should therefore play an important role in building projects of all sizes.

- What will be the benefits for the citizens, respective end-users / for the municipality / for the surrounding neighbourhood?

The main advantages of the new water storage system are that it will save resources and costs. In addition, the district heating boilers can be partially switched off.

Citizens play a minor role in the project implementation. Connected to the district heating system and the new water storage system is mainly the parish buildings, the church, the elementary school and a restaurant with hotel.

- How evident are they for your municipality?

They are very evident for this historical urban city district, which is difficult to access by the large district heating system of the city.

- How may the project Store4HUC influence your municipal policy strategy?

A successful implementation may result in the expansion of this small-scale district heating network with storage facility to other historic urban city districts. However, there are larger potentials for other cities with similar conditions (parish/church with hotel & restaurant and a school).

- What are the targets for your stakeholders for participating in the deployment desk (self-assessment)?

Due to the meetings, which take place about once every six months, the interest groups should follow the course of the project and be constantly updated. The meetings will include a summary of problems and their causes. By sharing the gained knowledge in a meeting, discussions about the implementation process can be raised, which contributes to an informed solution-finding.

National

- Are there any special social aspects to consider because the pilot will be a church?

No, not directly. The same requirements apply as for all historical buildings and listed buildings.

- How is the project seen within the church?

The church (the whole parish) is also interested in energy efficiency and in saving energy, as well are the interested in reduce the backflow temperature, so the solutions with enlarge the energy efficiency with several measures and to implement a heat exchanger, was a good solution for the parish and they are willing to support and finance the project

5. Implemented actions and links to deliverables, outputs

The W.E.I.Z. has set up the local deployment desk as part of its project work until now. In this context, various interest groups (local decision makers, members of the community, members of the biomass district heating network, sectoral authorities, energy experts, etc.) were involved in the process of controlling and planning energy storage. In this context, two deployment desk meetings were held. The launch of the deployment desk Meeting on 14 June 2019 and a second meeting on 11 September 2019 were used to discuss the feasibility study.

In the context of communication activities, the W.E.I.Z. provided inputs regarding D C.1.1 - the common communication strategy. The W.E.I.Z. also purchased a project rollup. A solar power bank will also be purchased by W.E.I.Z..

The most important (transnational) meetings, besides the project meetings in Slovenia and Italy, was the participation cross fertilization WS of Climate alliance in Rostock and the participation on 12th of September in a national event with the focus on "Energy-infrastructure". On the 29th of August a workshop on energy was organised by Weiz and the Project "Store4HUC" was presented there. A regional Meeting took place on the 2nd of July with the Government of Styria in Weiz were we presented solutions concerning climate adaption. The Store4HUC project is also on the W.E.I.Z. website and an article was written for regional newspaper.

6. Results, effects and the response

By the objective, innovative approach and despite additional expenditure it is possible to insert the existing biomass heating plant as well as the planned water buffer inconspicuously into the overall view. This can show that large thermal energy storage systems will be a technically and economically sensible option for providing heat and cooling in the future, even in buildings or districts protected by local and historical monuments, especially with regard to the integration of renewable energy sources. The result is that, following the Weizer model, the integration of a biomass local heating plant including thermal storage can be made possible at numerous locations in districts protected by local and historical monuments and therefore in Weizer districts by means of an integrated construction method for the plant. The number of cities with historical city centres in Austria is currently 44. In addition, 26 monuments are under protection in Weiz and 38 367 in Austria.

Considering these figures, there is broad agreement among the stakeholders to continue along the chosen path. However, the main critical points are the integration into the landscape and the resulting additional costs, which are necessary due to the additional planning. Since the pilot plant is not supported by investment subsidies from Store4HUC, external subsidies for the planned plant are an important goal of the stakeholders and will be investigated further. The stakeholders were particularly surprised by the fact that the innovative approach not only makes implementation possible, but also that it is possible to save almost 20 % of CO_2 emissions due to optimised boiler operation. It is also essential for the stakeholders and the implementation that the boilers can be used for a longer period of time due to optimised operation and thus costs can be saved.

7. Conclusion

At the end of the meetings the participating stakeholders were asked for a short feedback. Both meetings have been considered useful. The first one was a good start in the project, by explaining the concept of the deployment desk and providing an overview of the idea of the pilot. In the second meeting more detailed questions regarding to the technical, legal and social framework conditions of the pilot have been discussed. The external as well as the internal stakeholders have benefited from these discussions.

8. Annexes

8.1. Invitation and Agenda

19:00: „get together“

19:15: Welcoming speech (Johannes Schinagl, Managing director of Biomass district heating Weizberg)

19:30 Presentation of the procedure, backgrounds and targets of the deployment desk (Andrea Dornhofer)

20:00: Short presentation of the project Weizberg (Johann Neuhold – Chairmen of Biomass district heating Weizberg)

20:30 Questions about the project

Dieses Projektes „Store4HUC“ wird durch Mittel des transnationalen Interreg CENTRAL EUROPE Programmes zur nachhaltigen Entwicklung und Umsetzung von Energiestrategien und -maßnahmen in zentraleuropäischen Städten und Regionen gefördert!

AGENDA

Workshop: KICK OFF MEETING “Deployment Desk” STORE 4 HUC (Österreich)

Ort, Datum: Weiz, 14. Juni 2019, 19:00

1) Begrüßung:

Andrea Dornhofer, (Weizer Energie- Innovations- Zentrum), Johann Neuhold (Biomasse Weizberg)

2) Kurzvorstellung Projekt Store4HUC

Andrea Dornhofer (Weizer- Energie- Innovations- Zentrum)

3) Vorstellung Deploymentdesk Store4HUC

Andrea Dornhofer (Weizer Energie- Innovations- Zentrum)

8.2. List of participants

Dieses Projektes „Store4HUC“ wird durch Mittel des transnationalen Interreg CENTRAL EUROPE Programmes zur nachhaltigen Entwicklung und Umsetzung von Energiestrategien und -maßnahmen in zentraleuropäischen Städten und Regionen gefördert!

Workshop: Kick off Deployment Desk

Ort, Datum: Weiz, 14. Juni 19:00-21:00 Uhr

[redacted]

By signing, you agree that your personal data may also be used for the purposes of the narrative and financial control of the provider of funds and other public authorities to control the use of public funds. Your data are protected by public authorities in accordance with the European and Austrian regulations. The consent is required by the General Data Protection Regulation. If you do not want to share your personal information, enter only the name and surname and your signature.

[redacted]

Seite 2

Interreg CENTRAL EUROPE STORE4HUC Das Land Steiermark Regionen Innovationszentrum W.E.I.Z.

Dieses Projektes „Store4HUC“ wird durch Mittel des transnationalen Interreg CENTRAL EUROPE Programmes zur nachhaltigen Entwicklung und Umsetzung von Energiestrategien und -maßnahmen in zentraleuropäischen Städten und Regionen gefördert!

Workshop: Deployment Desk meeting 2nd meeting

Ort, Datum: EDERER, WEIZBERG 2, 11.09.2019, 08:00 – 10:00

[redacted]

By signing, you agree that your personal data may also be used for the purposes of the narrative and financial control of the provider of funds and other public authorities to control the use of public funds. Your data are protected by public authorities in accordance with the European and Austrian regulations. The consent is required by the General Data Protection Regulation. If you do not want to share your personal information, enter only the name and surname and your signature.

Interreg CENTRAL EUROPE STORE4HUC Das Land Steiermark Regionen Innovationszentrum W.E.I.Z.

[redacted]

Seite 2

8.3. Pictures

8.4. Web-links

- http://www.innovationszentrum-weiz.at/
- http://weizberg.heimat.eu/Index.htm

A. References

[1] Arbeitsgemeinschaft QM Holzheizwerke, Qualitäts-Management Holzheizwerke - Planungshandbuch, (2008).

[2] Österreichisches Institut für Bautechnik, OIB Richtlinie 6 - Energieeinsparung und Wärmeschutz OIB-330.6-009/15, (2015). https://www.oib.or.at/sites/default/files/richtlinie_6_26.03.15.pdf (accessed May 28, 2018).

[3] ÖNORM EN ISO 52000-1, Energieeffizienz von Gebäuden - Festlegungen zur Bewertung der Energieeffizienz von Gebäuden - Teil 1: Allgemeiner Rahmen und Verfahren, Wien, 2018.

DOCUMENTATION ON DECISIONS OF 1ST „DEPLOYMENT DESK" MEETING

ITALY

D.T1.1.2

Version: final

25.09.2019

Title	Documentation on decisions of 1st “Deployment Desk” Meeting in Italy
Deliverable	D.T1.1.2
Authors	Stefano Dotta, Robert Pratter, Alois Kraußler, Reiterer & Scherling
Contributors	
Status	final
Reviewed by	Luca Galeasso
Submission	25/09/2019

Content

1. Summary

The first Deployment desk was carried out within the timeframe set by the project at the City of Cuneo, with the participation of numerous stakeholders from the province of Cuneo and the Piedmont Region.

It was not possible to involve national stakeholders operating in the field of management of electricity grid (e-distribuzione, ARERA) and the national company that manage the incentive mechanisms aimed at promoting electricity generated from renewable energy and energy efficiency (GSE), which will be involved from the second deployment desk.

On the basis of the topics discussed, many ideas and suggestions emerged both for the development of the Pilot and more generally on the opportunities for development and dissemination of energy storage in urban areas.

Important and significant relations between energy storage technologies and the development of municipal policies on energy and environment.

The deployment desk has given the opportunity to create a better connection between the different sectors of Municipality of Cuneo in the definition of the energy and environment policy. Many results of the discussion will be useful for the develop of the SECAP that will be finalized at the beginning of the next year

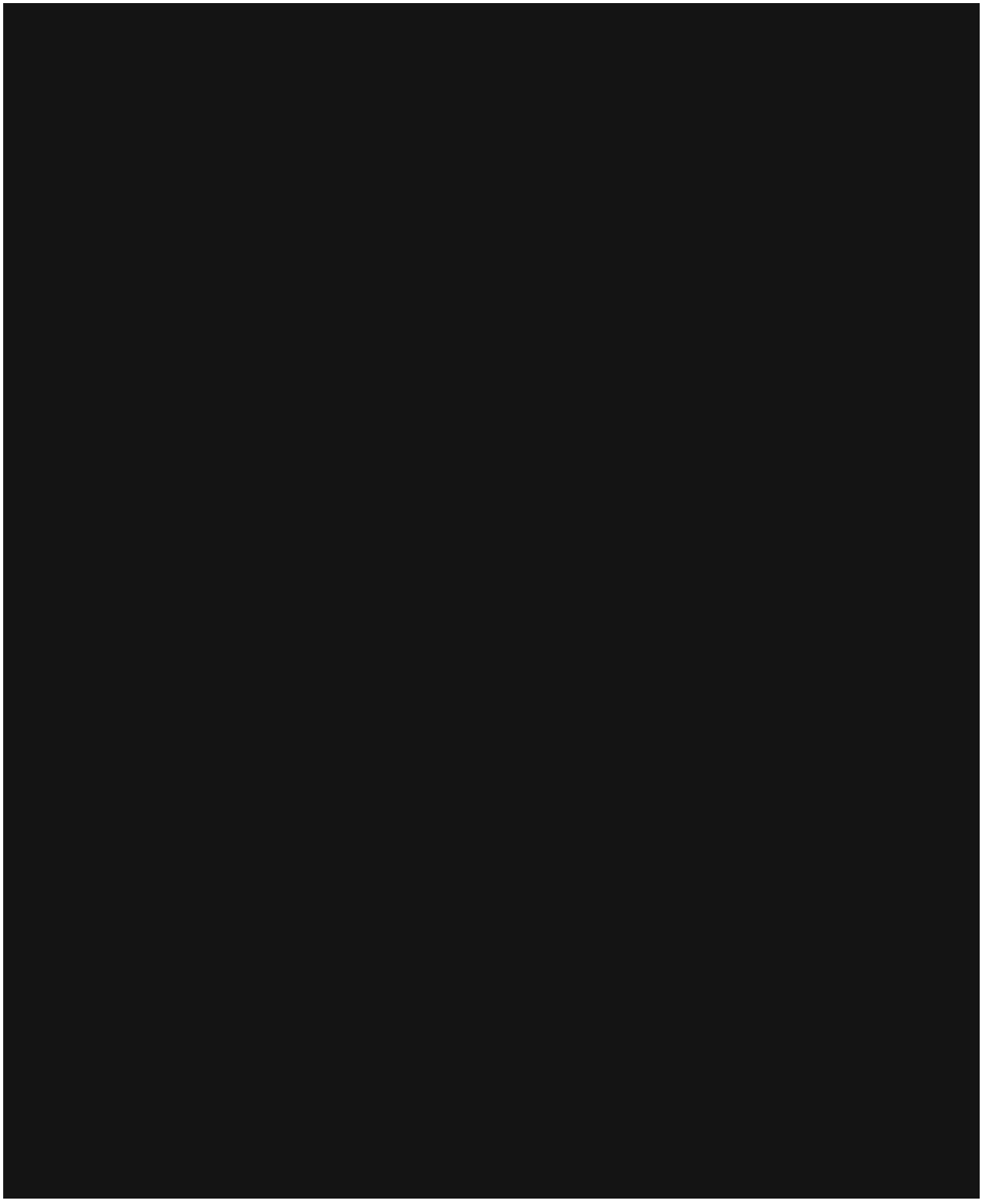
During the first deployment desk the stakeholder had also discussed on the opportunities to create energy communities on Piedmont Region and about the improvement of the smartness level in the municipality of Cuneo. Important and significant relations between energy storage and the development of municipal policies for the creation of energy communities and smart cities have also emerged.

2. Date and place

The first Italian deployment desk took place on 12 September 2019 in Cuneo at the Casa del Fiume in Via Porta di Mondovì 11A from 2.30pm to 5.00pm, before the deployment desk began, the kick-off event for the pilot was held in the same place.

3. Number and types of participants/target groups

The participants at the first Italian deployment desk are reported in the list below, the participants were 24, for each of them are indicate the name of the Organization/Public Authority/Private Company the types and the name of the participants person and signed participant list; For Italy this groups are:



4. Topics tackled

- The main topics discussed during the first deployment desk were three, and they concerned the opportunities, the constraints in the installation of energy storage in historic urban centres, as well as the contribution that energy storage technologies can make to the energy and environmental planning of municipalities in order to achieve the goals by 2030.
- All the topics discussed were contextualized in the reality of the Municipality of Cuneo, however the results and suggestions that emerged could be similar to those of Municipalities settled in other regions or countries
- These questions, which were divided in 3 main topics, were based on the information from DT 1.1.1. These topics were discussed one after another in two different working groups with 10 participants and two moderators, provided by the partners, for each.

4.1. Questions

First topic: The Energy Storage in Historic Centres: What opportunities?

- What are the needs for the installation of energy storage in historical centres?

  At the regional level there aren't specific need on technological aspect, actually technologies and expertise are on the market in the specific case of HUC the energy storage could be a big opportunity for storage energy produced out to HUC. Actually the needs are on regulatory field.

- What are the opportunities for the installation of energy storage in historical centres?

  In the specific case of HUC the energy storage could be a big opportunity for storage energy produced out to HUC. Many constraints concerning the protection of architectural and environmental heritage that prevent the installation of RES and Energy Storage in historic centres could be overcome by the installation of energy storage. The RES could be produced out of HUC and directly used in the HUC thanks to the energy storage.

- What incentives are available for the installation of energy storage? What forms of incentives could be adopted if they do not yet exist?

  Actually, in Italy are available specific incentives at the regional level, but not in all the Italian regions. Only in Veneto and Lombardia the private owners have the opportunity to require incentives for the installation of energy storage connected with installation of RES.

- What experiences or best practices do you know?

  Some good experience or best practice are known but many of them were developed thanks to pilot project or research project.

- Energy communities and historical centres, needs and opportunities

  The implementation of energy communities is considered like a big opportunity in order to improve the use of energy storage.

- RES - Energy storage - sustainable mobility: what interactions and opportunities for the implementation of energy communities in urban areas?

  The public and private urban transport are responsible of a huge amount of CO2 emissions energy consumption and air pollution, In the next years many old and inefficiency vehicles should be substitute with new electric, for these reasons a lot of recharge grid will be implemented in HUC. Recharge station will be connected with energy storage and RES in a new electric grid paradigm.

- Specific considerations about the Pilot, e.g.: The new energy storage and RES system that will be implemented in the sloping elevator could be integrated with a new urban mobility system and become an intermobility node (cars and electric bicycles).

  Yes, the idea is to produce more energy that the elevator consumes during the day thank to the implementation of a PV plant a new energy recovery system and a new energy storage, for these reasons the pilot must be strictly connected with a electric recharge system for cars and bicycles.

Second Topic: The Energy Storage in Historic Centres: What constraints?

- Are there barriers and regulatory constraints concerning the protection of architectural and environmental heritage that prevent the installation of RES and Energy Storage in historic centres?

  Actually, there aren't barriers and regulatory constrain concerning protection of architectural and environmental heritage that prevent the installation of Energy Storage in HUC but new regulation and low at national level must to be developed on the field of energy trading. The lack of regulation on energy marked based on energy decentralization and peer to peer energy trading prevents the spread of energy storage

- Is it easy to get the permits for PV installations in HUCs in Italy?

  It is quite easy if the building isn't protected by regulatory constraints, if is protected no PV plant could be installed

- Could innovative integrated photovoltaic systems help to overcome constraints and safeguard the historical/architectural heritage in historic centres?

  Innovative integrate photovoltaic system could help to overcome constraints but must evaluate case by case and depending by the overall architectural design

- Storage and sale of electricity produced by RES? Is it possible? For what uses? What authorizations?

  The lack of laws that can regulate the sale of energy produced by photovoltaic systems is the main barrier that limits the spread of energy Storage

- Specific considerations about the Pilot

  A regulatory barrier concerning the protection of natural heritage join with the lack of regulation on energy marked based on energy decentralization and peer to peer energy trading could limits the installation of PV plant foreseen by the project.

Third topic: Storage systems and energy/environmental planning towards the 2030 targets

- Who are the main actors and how are they connected?

  The main stakeholder involved on energy and environmental planning towards the 2030 targets are the different sector of Public Authority at different level (municipality, province, region)

- What opportunities does a municipality have to integrate economic, social, energy and environmental aspects into its policies?

  SEAP and SECAP are the principal opportunities to integrate energy and environmental aspect in a single municipal plan, but this document is effective only if integrated with the other planning and regulatory tools of the Municipality. In order to obtain social and economic benefits, greater interactions between the various sectors of the municipal administration are hoped for.

- What will be the benefits for the citizens, respective end-users / for the municipality / for the surrounding neighbourhood?

Public service more efficiency, sustainable and economic are benefits for the citizens. The use of energy storage connected with RES (also private) in order to provide energy for public service like public electric transport, green transport or public building could be a great benefit for all the citizens.

- How can the installation of RES and energy storage in historical centres be integrated and linked to municipal energy planning tools (e.g. CFSP, building regulations etc.)?

  The main regulatory barrier depending on national low concerning the protection of architectural historic heritage, the municipality can support the installation of RES and energy storage where it is possible with its regulation in terms of tax reduction or new building volumes.

- What do you think about the potential replicability on the regional territory of projects integrating accumulation and RES in historical centres?

  The Cuneo Pilot project could be replicate on the same municipality thanks to the new sustainable urban mobility plan that foreseen the implementation of new elevators that will connect the HUC with intermodal parking. Also, in the Province of Cuneo other municipality have similar public mobility system where is possible implement the same technology and solutions.

- Specific considerations about the Pilot

  The pilot is one of the measure of intervention foreseen by the SECAP

5. Implemented actions and links to deliverables, outputs

- All stakeholders were involved in the deployment desk initially through direct contacts (phone calls) and then through official invitations if necessary.

  Before the start of the deployment desk, all participants were given a description of the project's objectives and actions. In the next few days, a report will be sent with the topics covered and the results obtained from the first deployment desk.

  During the first deployment desk a rollup of the project was exposed.

6. Results, effects and the response

At the end of the first deployment desk the two working group leaders presented the results of the discussion at the participants, after that a short discussion on the result was carried out.

The first deployment desk has given to the partners same good suggestions for carrying out the next actions foreseen by the project, in particular for the implementation of the Pilot but also for the development of the municipal plans for energy and climate.

About the constrains the result of the discussion was:

- new regulation and low at national level must to be developed on the field of energy trading. The lack of regulation on energy marked based on energy decentralization and peer to peer energy trading prevents the spread of energy storage
- the rules for the protection of historical centres can be considered as barriers to the installation of renewable energy equipment but not to the spread of energy storage, on the contrary, these constraints could prove to be an opportunity for the energy storage technology

About the opportunities:

- The diffusion of energy storage in historical centres could be an opportunity to improve some of the services like the urban public transport and consequently the environmental quality of cities (air quality)
- This technology could help to overcame the historical and architectural constraints in HUC
- This technology give the opportunity to develop the energy communities in urban area
- This technology can enable energy decentralisation and increase energy production from renewable sources and achieve complete decarbonisation.
- A strong boost to the installation of energy storage could be given by new incentive policies implemented at regional and national level

About the energy and environmental planning towards the 2030 targets

- The first deployment desk was useful to the Municipality of Cuneo in order to understand that is necessary develop integrate planning involving the different sectors and plan (SECAP, municipal building regulations, urban master plan, urban plan for sustainable mobility etc)
- Municipal energy planning is transversal and the diffusion of energy storage can help in the development and implementation of different municipal strategies and policies.

7. Conclusion

- At the end of the meeting, a brief feedback was collected from the participants, who considered it useful to participate in the first deployment desk.

8. Annexes

8.1. Invitation and Agenda

The final agenda was:

- Kick-off event - open

  14:20: „get together“

  14:30: Welcoming speech (Davide Dalmasso - Councilor for the Environment and Mobility of the Municipality of Cuneo Avv., Luca Gautero - Director of the Public Works and Environment Sector of the Municipality of Cuneo)

  14:35: Short presentation of the project (Luca Galeasso – Environment Park)

  14:50: Visit to the sloping elevator

- Deployment Desk – stakeholders only

  15:10: Presentation of the Deployment Desk to the participants (targets and topics) (Stefano Dotta – Environment Park)

  15:15: description of procedure, division of participants in two work groups, short introduction of moderators (Stefano Dotta and Luca Galeasso Environment Park)

  15:20: First working group round

  15:45: Second working group round

  16:10: Third working group round

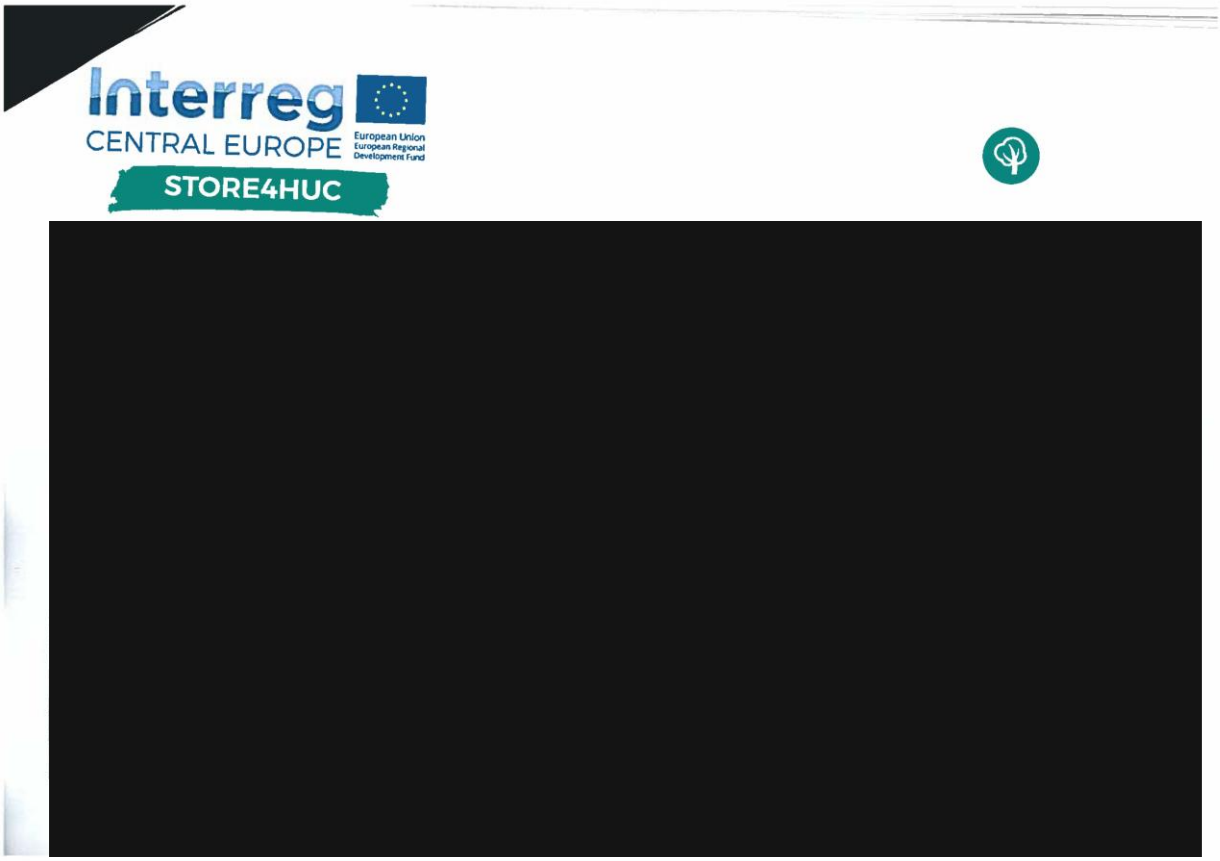
  16:35: Presentation of the results (working group leaders)

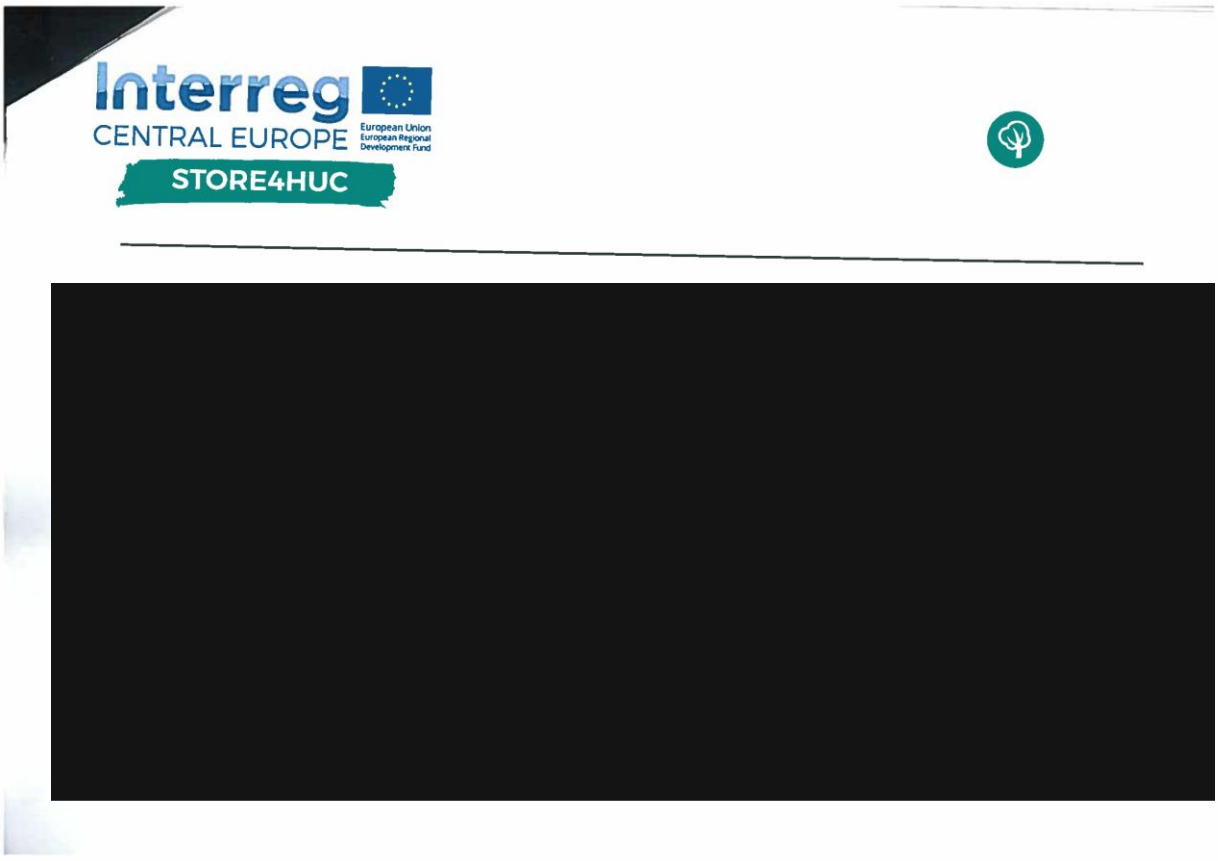
  16:50: Discussion on the results (Beppe Gamba – Environment Park)

  17:00: Expression of thanks and outlook on the next steps

8.2. List of participants

LIST OF PARTICIPANTS: D. T1.1.2 1st Deployment Desk meeting, Cuneo, 12.09.2019





8.3. Pictures

La Casa del Fiume

First Deplomento Desk (1°working group)

- First Deplomento Desk (2°working group)

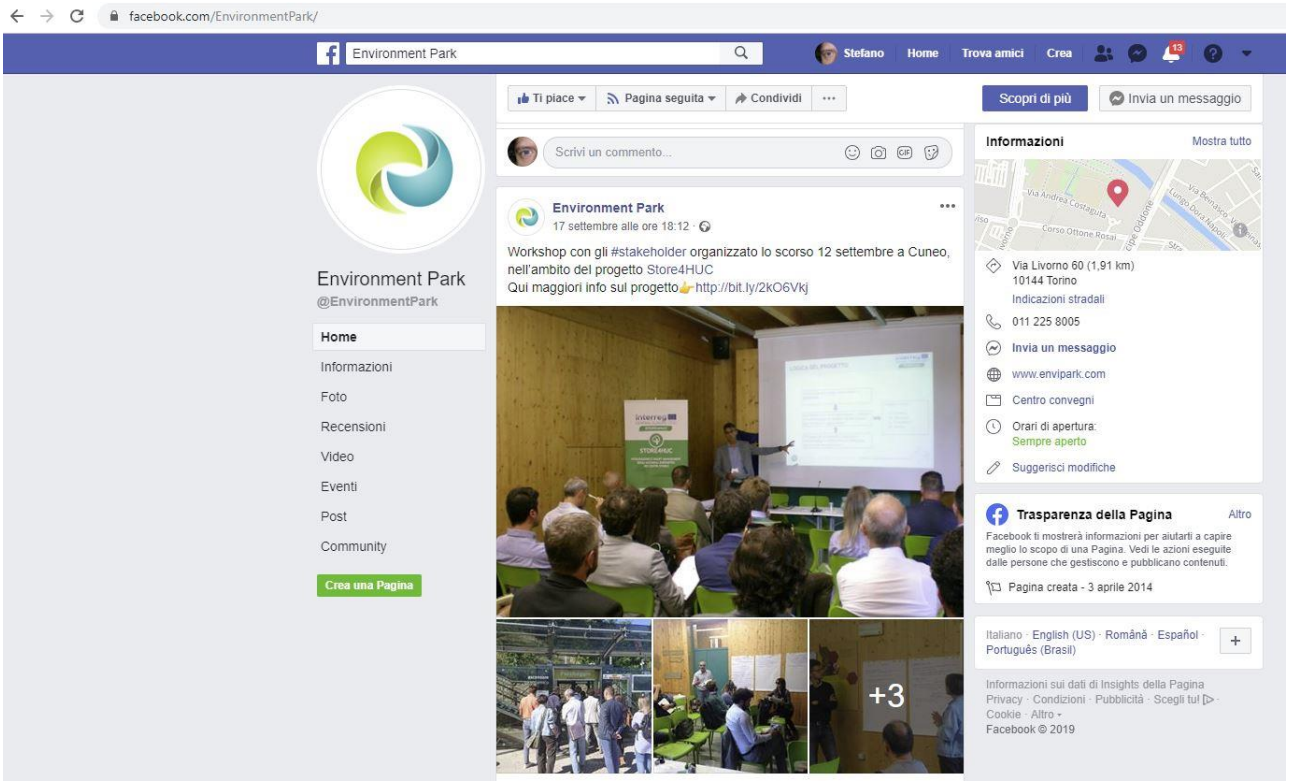
-

- Luca Galeasso during the presentation of the project

-

- The leader of first working group presents the results

8.4. Media coverage



- Environment Park facebook page

8.5. Web-links

http://www.targatocn.it/2019/09/17/leggi-notizia/argomenti/attualita/articolo/cuneo-avviati-i-lavori-del-progetto-central-europe-store4huc.html

https://www.cuneodice.it/varie/cuneo-e-valli/progetto-central-europe-store4huc-avviati-i-lavori-del-tavolo-degli-stakeholder_29365.html

DOCUMENTATION ON DECISIONS OF 1ST „DEPLOYMENT DESK" MEETING

GERMANY

D.T1.1.2

Version: final

09.2019

Title	Documentation on decisions of 1st “Deployment Desk” Meeting in Germany
Deliverable	D.T1.1.2
Authors	Wolfgang Hofstetter, Alois Kraußler, Robert Pratter, Reiterer & Scherling
Contributors	
Status	final
Reviewed by	
Submission	

Content

1. Summary

During summer 2019 several cities and institutions have been contacted. Three of them delivered written answers on the Store4HUC questions. The city of Heilbronn in the state of Baden-Württemberg which is part of the Central Europe area, a Bavarian city which is also located in the project area and the Energy Agency of the State of Northrhine-Westphalia, which lays outside the geographical Central Europe Area but whose stakeholder manages a nationwide network of churches. Their answers on the Store4HUC questions are shown in detail in this report.

Some other cities are interested in following the project, for example the city of Eschborn and the city of Würzburg. Finally proposals are made where possibly tool trainings and storage seminar could be provided in Germany.

2. Approach of the telephone survey

As there is no pilot city in Germany telephone and email contacts to different local authorities and institutions have been established instead of a physical meeting. The possible stakeholders have been approached due to the region in which they are situated – they should be in the regions covered by Interreg central Europe. Cities have been approached which have a long history and therefore should have monument protected buildings. Contacts have been activated to persons who deal with monument protected buildings or who have been active in this field in former years or which manage as multipliers networks where monument protected buildings are a topic.

An email was sent out explaining the persons the Store4HUC project based on the Store4HUC press release and indicating where additional information could be found like links to further information on the Store4HUC website, the news section of the Climate Alliance homepage and the Store4HUC project subpage of the Climate Alliance Homepage.

To get a written feedback on the Store4HUC questions it was necessary to keep close contacts by phone and email to the approached persons.

3. Number and types of participants/target groups

In Germany we got written feedback on the Store4HUC questions from 3 cities and institutions. We approached many more.

We got written answers from the energy management of a big Bavarian city. The person who supplied the feedback gives his own opinion, the name of the city has to be kept anonymous. If not it would be the official opinion of the city, a procedure which would have been much more complicated to go through and much more time consuming.

We received answers from the city of Heilbronn in Baden-Württemberg. The person involved works for the Stabsstelle City Development and questions for the future. The person engaged may be of special interest for the Store4HUC project because this stakeholder has a working experience in monument protection for many years.

This person tried to make a contact for Store4HUC with the Landesamt für Denkmalpflege Baden-Württemberg which is the upper monument protection authority of the state of Baden-Württemberg. This authority checked out the Store4HUC questions but finally rejected to contribute.

The third and last contribution we received from the Energy Agency of the State of Northrhine-Westphalia, department of energy application and climate protection in cities and regions. This contact is interesting for Store4HUC because the stakeholder is managing a network of 145 people and 29 dioceses and state churches of the roman catholic and the protestant church in Germany.

A personal meeting was arranged with the city of Eschborn, where the climate protection manager expressed his interest in following the Store4HUC results but has no knowledge about energy storage in monument protected buildings.

The situation is similar in the ancient city of Würzburg in Bavaria, where the stakeholder works in the field of energetic urban planning and reorganisation management which is part of the department of municipal energy management and building physics. The city wants to become active with monument protected buildings but runs not yet own projects. The stakeholder wants to observe the Store4HUC results. The city runs a local climate protection conference in October 2019 where monument protection is a topic in a panel discussion. For Store4HUC the contact was established too late to get a slot in this event.

In summer 2019 the manager of Quattropole was approached, which is a city network consisting of Luxembourg, the capital of Luxembourg, city of Metz, France and the german cities of Trier, with 2000 years of history, and Saarbrücken. The networks manager did spread the information into these cities but received no response.

Lately Nassauische Heimstätte was approached, a company which owns 59000 apartments in the Rhine Main Region to find out which energy storage projects they are running. The contact person did forward the Climate Alliance inquiry to other departments within the company but so far, we received no answer.

4. Topics tackled

The topics tackled have been developed and provided in cooperation with the Austrian partners. They are orientated on the other deployment desks. Despite of explaining the topics and questions by phone not all the approached stakeholder did understand all the questions. If we received written feedback in german language the answers have been translated by Climate Alliance into English language. The focus of the questions was put on the problems, needs and opportunities of EMS and energy storage planning in Germany. As monument protection is attached to the German states, not to the federal government, questions of the differences have been raised. The experience of the stakeholder was checked out, and it was tried to find out about the situation in Germany with getting permissions to install storages or PV systems in HUCs.

4.1. Questions and answers

What are the problems on EMS and energy storage planning in HUCs in Germany?

City of Heilbronn
Building measures on cultural monuments often stand in the area of conflict between the respective legal regulations for the protection of historical monuments as well as other design statutes and for the Climate and property protection.

Bavarian City
I don't see any connection between energy management systems and energy storage planning. Does it exist?

Energy Agency of the state of Northrhine-Westphalia
In Germany, storage facilities are part of the respective supply system. Whoever supplies a building, a neighbourhood or a region also takes care of the optimisation of the system, which may also include appropriate storage facilities. To optimize a system, an energy management system (EMS) can be implemented.

The design of the EMS and the dimensioning of the storage depend on the size of the supplied area. The following discussion is intended to clarify this. A distinction can be made between:
- Supply of individual objects (building owner = operator of the energy supply)
- Supply of neighbourhoods (many building owners are supplied by one energy supplier)
- Supply of regions (energy suppliers and many different end users)

As the current project focuses on energy storage systems in historic town and city centres, energy storage systems are likely to be of particular interest for individual and ensemble supply systems and local heating solutions.

The biggest problem in the planning of supply systems, including storage, is that often the requirements as a basis for the planning of the storage facilities are not known. This is the case, for example, if the energy supplier is not also the owner of the buildings to be supplied.

A further difficulty is planning security, as the obligation to connect and use (AuBZ) is highly controversial. If my knowledge is correct, then it is partly possible to establish an AuBZ for new housing estates, to what extent this is possible in the case of existing housing, is not known to me. However, I dare to make a question mark. However, this means that an investor - unless he receives reliable promises from potential

buyers in advance - will only know the actual requirements very roughly. A modular, expandable concept is recommended.

In all these fundamental considerations, the keyword HUC has not yet appeared. This is because the problems discussed so far are location-independent. In HUC, there are more problems with the structural integration of the storage facilities into the existing system. However, this question will be discussed later in the question on technical changes to monuments.

What are the needs on EMS and energy storage planning in HUCs in Germany?

City of Heilbronn
I can't give you any information about that.

Bavarian City
I can't give you any information about that. I do not see any connection between the energy management system and energy storage planning. Is there one?

Energy Agency of the state of Northrhine-Westphalia
There's only one definite requirement. Namely, that the listed building must remain intact. This refers both to the appearance of protected sites and to technical or structural changes to the monument itself. Otherwise the investor is free in the planning and technical conception.

What are the opportunities on EMS and energy storage planning in Germany?

City of Heilbronn
Certainly there are buildings in which an energy management system and an energy storage system make it possible to protect listed buildings and make sense for reasons of climate protection.
Historic old towns must be viewed in a differentiated way. Historic city centres, such as the Heidelberg's old town is protected as a whole according to § 19 DSchG BW. There are different legal regulations depending on the federal state and the degree of preservation of the city centres. Often not all buildings are listed, i.e. there is more room for manoeuvre for the interior of the buildings. However, changes to the external appearance of "non-cultural monuments" in historical areas are often subject to approval (e.g. through design statutes).

Bavarian City
I don't see any connection between energy management systems and energy storage planning. Does it exist?

Energy Agency of the state of Northrhine-Westphalia
The possibilities are manifold... I don't understand the question.

Are there any local differences? (Are the laws the same all over Germany, etc.?)

City of Heilbronn
In Germany the protection of historical monuments is in the sovereignty of the federal states, i.e. each federal state has its own law for the protection of historical monuments. As a result, there are different legal requirements for the restoration and modernisation of cultural monuments inside and outside historical monuments Areas.

Bavarian City
Basically, the laws regarding (electrical) energy storage are the same, but the law hands over the final responsibility for grid stability to the respective distribution system operator. The operator has some room to interpret the law. Therefore, a large electrical storage system with high power output may be allowed in one region but not allowed in another region, due to grid issues. Currently, there are more than 900 distribution system operators in Germany. Every electrical production unit and every electrical storage unit has to be registered with the distribution system operator. Large units also need a permission to operate before being connected to the grid.

Heat storage systems are usually not connected to any grid, therefore registration and approval is not necessary.

Energy Agency of the state of Northrhine-Westphalia
The legal framework conditions are basically very similar throughout Germany. The federal government defines the legal framework which the federal states formulate with the state building regulations. As far as I know, there are no legal requirements for the planning of storage facilities and EMS.
However, for planning and implementation there are the standards of the professional associations (DIN, VDI, DVGW etc.) which are regarded as recognized state of the art and which should be observed.

What experiences does the participant have with this topic?

City of Heilbronn
I myself worked for 10 years as a lower monument protection authority in Baden-Württemberg, before I took on a completely new task with climate protection. In this respect my answers from my experiences are based on the basis of the Baden-Württemberg Monument Protection Act.

Bavarian City
Currently we have 3 battery storage systems running in schools and kindergartens, none of them in listed buildings. But we have installed two PV-systems in a protected HUC area, one on the city's town hall roof and one on the façade of a school building vis-á-vis the historic city wall. Both are using special red PV panels.

Energy Agency of the state of Northrhine-Westphalia
As an advisory institution of the State of NRW, EnergyAgency.NRW has a wide range of contacts with projects implemented or in the planning stage in the municipal sector. In many of the projects, the inclusion of energy storage systems in the supply concepts is standard practice. They are standard for all heat generation technologies that require the heat generator to operate as continuously as possible (CHP, heat pump, wood firing), for supplied objects with strong fluctuations in the quantities purchased (hot water demand in sports facilities) or for weather-dependent energy production and therefore not simultaneous generation and demand (solar thermal).

Energy management is also established in NRW. In the case of local authorities, we assume that around 75 % will have a functioning energy management system, although of course we still have to differentiate what the EMS actually comprises. In any case, in these cases one can assume that the municipalities know the energy consumption of their buildings and plan and optimise the technical supply accordingly.

Is it easy to get the permits for such kind of installations in Germany (if the stakeholder does not have any experiences yet, what does he think about it)?

City of Heilbronn
Energy storage planning in cultural monuments is a new topic for me. Basically think I believe that the storage elements used, such as batteries and heat accumulators, which are housed in the adjoining rooms in the basement of a cultural monument and have no appreciable effect on the appearance and the historical substance, can rather be regarded as being compatible with the monument. However, it is always a case-by-case decision of the responsible authorities, because each cultural monument is individual.

I have also not yet dealt with the digital recording of the energy consumption of cultural monuments and the associated problems. Here, too, the statement already made applies - e.g. with regard to cable and pipe routing.

Bavarian City
When talking about the storage system itself, getting the permission is not difficult. Those systems are usually installed in the basements and do not have any issues with historical building protection. The challenge is to get a permission for the energy generation unit (i.e. PV panels or solar thermal modules) which is visible from outside.

Energy Agency of the state of Northrhine-Westphalia
I am not aware of any difficulties in approving energy storage devices.

Are there already some best practice examples the participant is involved/know about?

City of Heilbronn
No, I'm afraid not.

Bavarian City
See above for examples. It is always better to work closely together with the people responsible for permissions for listed buildings at an early project state. They make the final decision and set the rules to get it, therefore it makes sense to develop a way forward together. In our city, the co-operation is quite good and the responsible people are open for new ideas. In other cases that I personally know, other cities sometimes have more problems.

Energy Agency of the state of Northrhine-Westphalia
No, I'm afraid not. There are many realized projects in which energy storage was realized in the listed area. However, this is often not explicitly emphasized, since the storage is dependent on the technology, not on the building (=> first question and answer).

However, I am also aware of a project in which a quarter in a listed area is to be supplied with electricity: Energy Laboratory Ruhr: https://www.energieagentur.nrw/tool/kommen/detail.php?ID=29380

Which kind of storages are preferred in Germany? (are some easier to install/get permits in HUC than others)?

City of Heilbronn
I have no experience and no knowledge of this.

Bavarian City
Heat storage systems are more difficult to get permission for, because – as far as I know – the solar thermal modules are always black. Therefore, in our case it would not be possible to get a permission for red roofs of listed buildings. Since PV panels are available in different colours, it is easier to have them installed on listed buildings. But it is economically not feasible, see below.

Energy Agency of the state of Northrhine-Westphalia
The main technology in the heating sector is hot water storage tanks.

Are there also some latent heat storages used (as planed in Lendava)?

City of Heilbronn
I have no experience and no knowledge of this.

Bavarian City
No. We have district heating in our historic city centre, therefore no need for heat storage.

Energy Agency of the state of Northrhine-Westphalia
The most common variant of latent heat storage is ice storage. The technology is currently establishing itself on the market. The last teething troubles are just being eliminated. I know of a regional church that focuses on wood pellets + ice storage in its CO2 reduction programme. Here also objects in the monumental area could have been realized. However, I cannot ask my colleague right now because she is on summer holiday.

I am not aware of any paraffin storage facilities that have been realised.

Is it possible/easy to get a permit for PV systems in HUCs?

City of Heilbronn
The question must be considered in a very differentiated way and it is not easy in principle to obtain permits under monument protection law for such installations. What is decisive first of all is how the cultural monument is classified, e.g. in Baden-Württemberg, whether it is a cultural monument according to § 2 DSchG or a cultural monument of special importance (§ 12 DSchG). Cultural monuments of special importance enjoy special protection in Baden-Württemberg through their entry in the Register of Monuments. They are also protected with regard to their effect in their surroundings, i.e. changes in the appearance of surrounding, non-listed buildings are also not possible without further ado. Furthermore, there are still complete areas according to § 19 DSchG, such as historical city centres.

A further aspect is the nature of the cultural monument and how much original substance and possibly listed substance from other more recent style epochs is preserved. Each decision is an individual decision of the competent authority.

Bavarian City
It depends on the people working in the institutions. In our city, the responsible person for historic buildings has set up some rules to get permission. For example, PV panels have to have the same colour like the roof tiles, i.e. red in our case. Also, the PV-system has to be integrated into the roof. When these rules are followed, PV-systems would be permitted. Unfortunately, the high costs of special red PV-panels make these systems economically inefficient and private investors as well as e.g. the local perishes refrain from installing these systems.

Energy Agency of the state of Northrhine-Westphalia
It is very difficult to obtain approval for PV systems in Germany in general and in North Rhine-Westphalia in particular. The reason for this is the very consistent protection of historical monuments. The approval of building measures in the area of the protected buildings must be granted by the monument protection authority. However, the officials there always have the decisive word. A weighing of goods takes place very rarely.

A distinction must be made between:
- The protected area and
- The solar system at or on a protected building

Protected area
The image of a place is protected. This can be the "skyline" of the place as well as the picture of the streets. In this case, the elements of the PV system would result in a disturbance factor in the roof image, so that no PV system can be approved - even for new buildings. One has a chance in the case of non-publicly visible parts of buildings that are not listed as historical monuments.

Although there are similarly designed PV modules for historic roof tiles, the question of whether they are recognisable or even disturbing depends on the individual assessment of the respective regional authority. Its decision is then incontestable. In all cases known to me, the approval was refused.

A solution approach would be precedents, preferably from the direct environment or federal state, but to the best of my knowledge there is no corresponding survey.

Solar system on a protected building
Here the restrictions lived are even harder. The specification of the monument protection is that the original building substance is to be preserved absolutely original. Drilling a hole already means damage to the existing structure and, depending on the object, is viewed very critically. Actually, measures which are normally not visible and do not mean any intervention in the protected building fabric should be able to be approved, but also here the approval is often refused. In NRW, there are no PV systems known to us on listed buildings - rather the other way round: we are aware of several cases in which realised systems on monuments had to be removed again.

Good examples:
https://www.infranken.de/regional/kitzingen/Die-Sonne-lacht-fuers-Denkmal;art113220,2637607
https://www.freiburg.de/pb/,Lde/1059456.html

The difu brochure "Climate Protection & Monument Preservation" is very worth reading, especially the example of the city of Fürth on pages 61-63:
https://difu.de/publikationen/2011/klimaschutz-denkmalschutz.html

The fact that one can see it also differently shows this court decision:
https://www.stuttgarter-zeitung.de/inhalt.solaranlage-klimaschutz-schlaegt-denkmalschutz.9bd801fa-d42a-4fd9-a922-281558bc37a6.html

Yes, and then there is the statement of the monument protectors: "Arbeitsblatt 37: Solaranlagen und Denkmalschutz".

With this worksheet, the Association of State Monument Preservers defined its position on the approval of photovoltaic systems in the monument sector as early as spring 2010. It states among other things:

"The preservation of historical monuments is also not fundamentally closed to climate policy goals and sees solar energy as a sensible application technology. However, it also says that the public interest in climate protection does not enjoy a privilege over the interest in the protection of historical monuments. And elsewhere: solar systems usually [...] represent a sensitive disturbance of the historical and monumental appearance of a monument. They are rarely compatible with [...] traditional covering materials."

At the same time, however, the hope is expressed that further technical developments will help to minimise interventions in the substance and/or appearance of monuments or show alternatives without negative influences on the objects of protection.

Furthermore, possible test criteria for the always necessary individual case examination are defined. In summary, it can be said that solar systems are most likely to be approved if they:

- primarily serve the energetic supply of the monument,
- the location of the installation is inconspicuous or cannot be seen from the public space,
- the intrinsic effect of the system modules is as small as possible,
- they are subordinate to the overall appearance of the monument in terms of colour, structure and size, and
- they can be integrated into the design character of the existing architecture.

Link to the worksheet:
http://www.vdl-denkmalpflege.de/fileadmin/dateien/Arbeitsbl%C3%A4tter/Nr37.pdf

From the site:
http://www.vdl-denkmalpflege.de/veroeffentlichungen.html

Are PV roof tiles or translucent PV systems an alternative to conventional PV systems in HUCs?

City of Heilbronn
The fairness of materials is of great importance in Baden-Württemberg. This also involves numerous building physics issues that have to be examined on a case-by-case basis. I myself have no practical experience in this field.

Bavarian City
As said above, red PV roof tiles would be perfect, but these are even more expensive than standard-sized red PV panels. Therefore – theoretically yes, practically no.

Energy Agency of the state of Northrhine-Westphalia
As described above: Theoretically "yes", practically unfortunately so far: "No".

Not asked, but the answer is obvious:

What is the situation regarding the realization of energy storage systems in the listed area?
As described above, there should be no approval problems as long as no intervention in the historical inventory is required for the realisation.

There can also be problems if the energy concept requires in addition to the energy storage pipes have to be laid for this. Especially in historical town centres there are often archaeological finds which are then "excavated" and possibly have to be preserved. Then the laying of a local heating pipe through the foundation of a medieval house can become difficult.

Excursus: Network "Energy & Church" in Germany

The contact person in the Energy Agency of the state of Northrhine-Westphalia is managing the network: „Energy & Churches“ in Germany

The network was founded three years ago. The aim was to cooperate more at the technical level, to facilitate a direct exchange of expertise and to implement projects together. Currently 145 employees from the fields of construction, energy and climate protection from 29 different dioceses and regional churches are represented in the network. These are employees from the church districts (Kirchenkreise) as well as from the regional church offices (Landeskirchenämter) and general vicariates. All hierarchical levels are also represented in the network, from specialist architects from the church district (Kirchenkreis) and climate protection managers to diocesan master builders (Diözesanbaumeister) and regional church building directors (Landeskirchenbaudirektor. - If one wants to reach the actors in the field of energy efficiency and climate protection from the church sector, the network probably offers the best platform.

Unfortunately, the network itself is a "closed-shop", which means that I cannot give you direct access to the network. But I am happy to offer you to bring your requests and information into the network. The resources are also limited in the church area, but if your information / offers / inquiries have a certain nutritional value for the church representatives, I can well imagine that you can get support from this area.

In my opinion, the topic of climate protection and sustainable energy supply in the building sector has been more well received by the churches than in the municipal sector. In the cities and municipalities of NRW, the financial limits are still decisive. An investment in the municipal sector must be refinanced in around 10 years for it to be eligible for approval. And since the majority of municipalities do not have a balanced budget, the freedom is rather limited. The situation is different in the church sector. The "preservation of creation" is one of the basic missions of the churches. Accordingly, climate protection in general and the achievement of a CO2-neutral building stock is a task to which many dioceses and regional churches (Landeskirchen) are intensively dedicated. A CO2-neutral building stock includes the use of renewable energies on the one hand and since the simultaneity of energy use is usually not given, the installation of energy storage systems is a natural part of the projects on the other hand. If this knowledge is combined with the quota of listed buildings in the church area, the relevance of your project for the churches becomes clear.

An example: In a parish, the renewal of the boiler for the church is on the agenda. In the immediate vicinity of the church, in addition to the kindergarten, community centre and parsonage, there is also a rented multi-family house - this or similar is the case in many parishes. One can already speak of a quarter. As the church's boiler accounts for around 40 % of the total installed capacity, it is being considered whether to find a sustainable heat supply for this area. Each of the envisaged energy technologies requires a heat storage to decouple generation from demand. It is usually planned as a daily balance, but the first weekly storage tanks are also being considered. A very desirable option would be the combination of solar thermal with a seasonal storage tank, but these variants are not yet known to me.

If solutions are worked out in your project for such an application, then they are particularly exciting for the churches. As I said, I am happy to bring your information / requests / etc. into the network.

5. Implemented actions and links to deliverables, outputs

Like already mentioned above the main action consisted of contacting different city representatives by phone, explaining the targets of the Store4HUC project and sending additional information by email. In order to obtain a written feedback, usually several phone calls are necessary. The contact persons got chosen from cities with a long history, where we suppose that they have monument protected buildings within its areas. They got chosen looking on the background with a possible professional knowledge in monument protection. Some representatives got approached during participation in events or invited to personal meetings. We tried to get in contact with monument protection authorities through persons who are already in contact with them. We contacted the manager of another city network hoping to get through him direct contacts to some additional cities and we kept in mind that we need contacts representing different target groups. The action took place in a very early stage of the project. At this time no promotional material was available. We used the information provided about Store4HUC in the press release and the Climate Alliance news section of the homepage and the Store4HUC subpage running on the Climate Alliance homepage. At this early stage of the project there is no connection with Store4HUC deliverables. Now the situation changed and meanwhile the Store4HUC website and social media accounts on facebook and linkedIn are online.

6. Results

We received written feedback from 2 municipalities and one energy agency. Two other municipalities did respond in a positive way showing interest in following the project. They didn't want to provide written feedback because they are just starting being active in the Store4HUC field and don't feel save writing about this topic.

Problems

- Building measures for climate protection at cultural monuments often are in conflict with the legal regulations for the protection of historical monuments
- energy storage systems are likely to be of particular interest for individual and ensemble supply systems and local heating solutions
- often the requirements as a basis for the planning of the storage facilities are not known. Especially if the energy supplier is not the owner of the buildings to be supplied
- A big difficulty is planning security because an investor will only know the actual requirements very roughly. Therefor a modular, expandable concept is recommended
- In HUC there are problems with the structural integration of the storage facilities into the existing system

Needs

- The investor is free in the planning and technical conception, but the listed building must remain intact

Opportunities

- Often not all buildings are listed in a HUC. This means there is more room for manoeuvre for the interior of the buildings. Changes to the external appearance of "non-cultural monuments" in historical areas are often subject to approval (e.g. through design statutes)

Local differencies

- In Germany the protection of historical monuments is in the sovereignty of the federal states, i.e. each federal state has its own law for the protection of historical monuments
- Basically, the laws regarding (electrical) energy storage are the same, but the law hands over the final responsibility for grid stability to the respective distribution system operator. Therefore, a large electrical storage system with high power output may be allowed in one region but not allowed in another region, due to grid issues
- Heat storage systems are usually not connected to any grid, therefore registration and approval is not necessary
- For planning and implementation there are the standards of the professional associations (DIN, VDI, DVGW etc.) which are regarded as recognized state of the art and which should be observed

Experiences of the participant

- One of the participants providing feedback has worked for 10 years in the lower protection monument authority of a german state. An energy manager runs battery storage systems in not protected buildings and PV-systems in a protected HUC area.

- The consultant of the energy agency has a wide range of experience with municipal projects and energy storage.

Permits for installations

- Always it is a case-by-case decision of the responsible authorities, because each cultural monument is individual. Basically the storage elements which are housed in the adjoining rooms in the basement of a cultural monument and have no appreciable effect on the appearance and the historical substance, can rather be regarded as being compatible with the monument. The energy manager of the bavarian city says that the challenge is to get a permission for the energy generation unit (i.e. PV panels or solar thermal modules) which are visible from outside.

Best practice examples

- The representative of the city of Heilbronn knows no best practice examples, the energy manager from the bavarian city only very few. The NRW energy agency representative seems to know several examples. One of these is in the framework of the Energy Laboratory Ruhr

Kind of storage

- The main technology in the heating sector are hot water storage tanks. Solar thermal modules are always black. Therefore it would not be possible to get a permission for red roofs of listed buildings. Since PV panels are available in different colours, it is easier to have them installed on listed buildings. But it is economically not feasible.

Latent heat storages

- City of Heilbronn is not aware of any paraffin storage facilities that have been realised. In the Bavarian city they have district heating in their historic city centre, therefore no need for heat storage.
- In NRW the most common variant of latent heat storage is ice storage. The technology is currently establishing itself on the market. The representative knows of a regional church that focuses on wood pellets + ice storage in its CO2 reduction programme.

Permit for PV systems

- The question must be considered in a very differentiated way. The permit depends on how the cultural monument is classified. In Baden-Württemberg in case it is a cultural monument of special importance it enjoys special protection. In that case the buildings are also protected with regard to their effect in their surroundings including non-listed buildings. Each decision is an individual decision of the authority. In the Bavarian city everything depends on the people working in the institutions. If the set up rules of the person in charge are obeyed a permission is possible.

- The NRW energy agency confirms that it is very difficult to obtain approval for PV systems.

- The officials in the monument protection authority have always the right to decide. If the whole area is protected no PV system can be approved - even for new buildings. Although there are similarly designed PV modules for historic roof tiles, in all cases known to him the approval was refused. In NRW, there are no PV systems known to the energy agency on listed buildings.

PV roof tiles

- The high costs of special red PV-panels make these systems economically inefficient and private investors as well as e.g. the local perishes refrain from installing these systems. Energy Agency of the state of Northrhine-Westphalia states that in theory PV roof tiles would be a solution but practically its not possible to obtain a permit.

7. Conclusion

- Getting a permission for installing PV or energy storage in historical buildings can be difficult. In some german states practically impossible. It depends on the rules set by the persons in the monument protection authorities.

- Because of financial restrictions in the municipalities its more likely to install a storage system related to the churches.

- In the days of writing this report in the city of Würzburg organizes an event dealing with using solar energy in the old part of the city. As they are member in Climate Alliance we could plan a common event with Store4HUC and I would like to have a storage seminar with them.

- It seems that the topic of climate protection and sustainable energy supply in the building sector has been more well received by the churches than in the municipal sector. As the "preservation of creation" is one of the basic missions of the churches, the achievement of a CO2-neutral building stock is a task to which many dioceses and regional churches (Landeskirchen) are intensively dedicated. The installation of energy storage systems could be a natural part of the projects to reach this goal. If this knowledge is combined with the quota of listed buildings in the church area, the relevance of the Store4HUC project for the churches becomes clear.

- The network “church + energy” itself is a "closed-shop", which means Store4HUC can not get direct access to the network. But the stakeholder could bring our requests and information into the network. If the Store4HUC informations and tools have the expected value for the church representatives, we should get support from this area. We should concentrate on testing the tools in Germany with the churches.

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8. Annexes

8.1. Web-links related to the action

Good examples:
https://www.infranken.de/regional/kitzingen/Die-Sonne-lacht-fuers-Denkmal;art113220,2637607
https://www.freiburg.de/pb/,Lde/1059456.html

The difu brochure "Climate Protection & Monument Preservation"
https://difu.de/publikationen/2011/klimaschutz-denkmalschutz.html

Court decision:
https://www.stuttgarter-zeitung.de/inhalt.solaranlage-klimaschutz-schlaegt-denkmalschutz.9bd801fa-d42a-4fd9-a922-281558bc37a6.html

Arbeitsblatt 37: Solaranlagen und Denkmalschutz

Link to the worksheet:
http://www.vdl-denkmalpflege.de/fileadmin/dateien/Arbeitsbl%C3%A4tter/Nr37.pdf
From the site:
http://www.vdl-denkmalpflege.de/veroeffentlichungen.html