FEASIBILITY STUDY FOR IMPLEMENTING ENERGY STORAGES IN WEIZ (AT)

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Content

1. Introduction

In course of the project Store4HUC, a feasibility study will be carried out for every pilot region (IT, AT, CRO, SI). A feasibility study is simply an assessment of the practicality of a proposed plan or project. It takes all relevant factors into account—including economic, technical, legal, and scheduling considerations—to ascertain the likelihood of completing the project successfully and is therefore used to discern the pros and cons of undertaking a project before they invest a lot of time and money into it. As the name implies, the study deals with the question, if the project/pilot is feasible or not. The main goals can be defined as follows:[1]

- To understand thoroughly all aspects of a project, concept, or plan
- To become aware of any potential problems that could occur while implementing the project
- To determine if, after considering all significant factors, the project is viable — that is, worth undertaking

This document will deal with the feasibility study of the pilot in Weiz. The feasibility studies should outline the constraints and solutions from various aspects (technical, economic, monumental protection, status quo of HUC, ensure further implementation actions, etc.) to implement the pilot at the historical sites. The main target of the study is to enable a decision making about the pilot ("go" or "no-go" decision). A further target is to inform all relevant stakeholder and to get a first feedback from them. In contrast to the pre-investment concept, which will be carried out in D.T. 2.1.4, the feasibility study will focus on first rough analysis and plausibility checks. If the feasibility study leads to a positive result, the pre-investment-concept will be carried out as next step, where all specifications of the pilot for the application of the building permit will be specified. Therefore, the pre-investment-concept has to be much more detailed than the feasibility study, but nevertheless all major impacts are already considered in the feasibility study, to enable the evaluation of the pilot.

To clarify the vision of the pilot, the mission statements according to the UNESCO-rules/conservation rules, the sustainability criteria, the environmental friendliness, the moderns and the legislation are defined in the second chapter. Based on the mission statements, strategies, targets and operative actions are deduced for the pilot. To classify the meaning of the pilot for the proposed HUC, the status quo is described in chapter three, dealing with questions like: "Are there already any other best practice examples on RES and EE?", "How great is the willingness of the city/region for innovations like this?" or "What are the constraints, benefits, changes and barriers", and so on?

In chapter four, the main factors for the assessment of the pilot are discussed. Starting with the technical specifications of the pilot like "what is planned?", "which type of storage will be used?"," why is this type of storage considered as the best option?", "what other installations are planned?", etc. From the economic perspective, the estimated costs (investment, operation) as well as the expected savings are explained. A first finance plan shows how the pilot will be financed and the next steps are planned. Moreover, a SWOT analysis was carried out, the show the strengths, weaknesses, opportunities and threats, of the pilot plant. Based on this information, the assessment of the practicality of a proposed pilot can by carried out.

[1]Kenton, Will (11.08.2019): Feasibility Study. URL: "https://www.investopedia.com/terms/f/feasibility-study.asp [10.10.2019].

2. Mission Statements

The aim of the pilot project is the implementation of a central thermal energy storage tank in the existing biomass heating plant Weizberg.

Due to the lack of a central storage tank in the heating plant, the boilers are currently operating mainly in the disadvantageous partial or low load range. This leads to increased fuel consumption and emissions (CO, NOx, dust and volatile unburned CnHm).

One of the main reasons for the missing of a storage tank is the location of the heating plant in the historical urban centre Weizberg, which is a historic monument and landscape protection zone. At present, the integration of large storage tanks for local heating networks in historic monument and landscape protected districts and buildings protected poses a very great challenge. The associated structural alterations must comply with the strict requirements of the local historic monument and landscape protection rules.

A possible solution for this problem is to be demonstrated by the project in question through the innovative implementation of a central water buffer in the historic urban centre of Weizberg. The constructional requirements for the adherence to the protection of the historic monument and landscape are to be fulfilled by new solution concepts.

Due to the above-mentioned challenges, however, there is a need to catch up in terms of energy efficiency and the use of renewable energy sources, especially in these districts with its listed buildings concerning historic monument and landscape protection. The project in question can and should therefore serve as an innovative best-practice example over the next few years and as a model for simplified technical and, above all, economic implementation in protected historic monuments and landscapes and lead to a significant increase in the proportion of renewable energy sources in historic urban centres.

2.1. According to european and international guidelines and recommendations on conservation and rehabilitation of historic monuments and sites

Goals and actions to be achieved by this project are in accordance and in respect with key ethical and technical guidance and recommendations on heritage interventions brought by most relevant European and international institutions that deal with heritage protection and conservation such as UNESCO, European Commission, Architects' Council of Europe and above all ICOMOS - International Council on Monuments and Sites, only global non-government organisation dedicated to promoting the theory, methodology, and scientific techniques to the conservation of heritage. All those international charters for the conservation and restoration of monuments, starting from *The Venice Charter (1964)* up to more recent *The Valletta Principles for the Safeguarding and Management of Historic Cities, Towns and Urban Areas (2011)*, *The Paris Declaration On heritage as a driver of development (2011)* and most recent documents delivered in the framework of the European Year of Cultural Heritage 2018; *Leeuwarden declaration on adaptive re-use of the built heritage: preserving and enhancing the values of our built heritage for future generations and European Quality Principles for Cultural Heritage Interventions* insist on following:

- Investments in cultural heritage that are bringing benefits across the four areas of sustainable development: economy, culture, society and the environment,
- re-use of heritage monuments that will make them sustainable and comfortable for modern use and in that way will bring to prolongation of their life,
- on multidisciplinary- usage of knowledge and skills form different disciplines,

- on using a new solution to emphasise and strengthen cultural values and give added value to a monument or site,
- on bringing new functions to heritage monument that respond to community needs,
- on reuse of heritage sites that can generate new social dynamics in their surrounding areas and thereby contribute to urban regeneration,
- with smart renovation and transformation heritage sites can find new, mixed or extended uses.

2.2. According to sustainability criteria

This pilot project is fully integrated into the regional climate and energy strategies of the City of Weiz, the KEM Weiz-Gleisdorf and the Catholic Church of Styria. The main points of these strategies are briefly summarised below:

(1) Municipality of Weiz

The municipality of Weiz has set itself the goal of reducing per capita CO_2 emissions by 40 % by 2030 compared to 1990. This means a transformation of the energy supply away from conventional, easily controllable fossil energy sources towards fluctuating energy sources that are difficult to control in terms of generation, combined with storage technologies and energy efficiency measures. Although the share of renewables is increasing, especially in the electricity and heating sectors in Weiz, there is an increasing demand in transport, industry and above all in listed buildings and districts.

(2) Catholic Church Styria

One of the main customers of the biomass heating plant Weizberg is the parish Weizberg with the basilica Weizberg. The climate and energy strategy of the Catholic Church of Styria was put into effect by Bishop Dr. Wilhelm Krautwaschl on 1 October 2018. The basis for this climate and energy strategy was laid down in the resolutions of the Austrian Bishops' Conference of 11 November 2015 in three ecological goals:

a) Reduction of energy demand
b) Increase of energy efficiency and
c) Coverage of the remaining energy demand by renewable energies

(3) KEM Weiz-Gleisdorf

The higher-level climate and energy model region "Energy Region Weiz-Gleisdorf" pursues an efficient use of the available resources with the goal of 100 % resource use for electricity, heat and mobility through renewable energy sources by 2050. The achievement of these goals also requires an optimization of the existing systems with regard to the local heat expansion, the associated use of storage as well as the increase in energy efficiency, as can also be seen from the statements of the local development concept:

a) A drastic increase in energy efficiency is necessary in all sectors, this is the only way to reduce energy consumption - especially in the building sector (refurbishment)".
b) Storage technologies must be developed strategically to improve the integration of renewables".

2.3. According to environmental friendliness

The biomass heating plant Weizberg already offers a heat supply with the CO_2 neutral and 100 % renewable energy source wood, but the plant is currently inefficient due to a lack of thermal energy storage. Thus, at present more wood is burned than necessary and the locally limited surface consumption is substantially higher than necessary. The integration of a thermal energy store into the existing heating plant can counteract this and contribute to more efficient land use. In addition, the use of regional wood chips by regional farmers will help create added value in the region.

Creative, intelligent and "smart" solutions are currently required at local and regional level in order to be able to supply the Weiz municipality, the parish of Weizberg and the energy region of Weiz-Gleisdorf with renewable energy sources and to optimise their energy efficiency for buildings and districts that are listed as historical monuments or landscape protection. 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 zone of the Weizberg Basilica.

The integration of a thermal energy storage system into the existing Weizberg biomass heating plant to increase flexibility and energy efficiency is thus fully and seamlessly integrated into the regional climate and energy targets.

2.4. According to modernes / state-of-the-art

Figure 1 shows a pre-selection and the feasibility of possible storage solutions for the biomass heating plant Weizberg[2,3]. The considered storage solutions were subdivided into sensible, latent and thermochemical thermal energy storages (TES). Technologies that are not feasible, including the reasoning, can be found in red in the figure. The analysis of possible storage variants showed that additionally to the conventional water tank storages, two more storage variants are conceivable for the project in question. On the one hand a hybrid storage consisting of macro-encapsulated PCM (phase change material) and water as storage medium combined in a conventional steel tank and on the other hand a vacuum-super isolated water tank.

Vacuum super-isolated water tanks can store energy more efficiently (lower heat losses – heat conduction 4 to 10 times lower) compared to conventionally insulated water tanks[4,5]. Thus, they can be used as long-term storages (weekly or monthly). However, the heating plant in Weizberg is operated with biomass boilers as only heat source. There is no other available volatile RES (e.g. solar thermal), which would require long-term storage. Therefore, there is no need for long-term storage. Furthermore, a vacuum super-isolated water tank with a storage volume of 38 m³ would cause additional investment costs of +25 % compared to a conventional water tank[6].

The hybrid storage with macro-encapsulated PCM has the advantage that the needed volume for the storage because of the higher energy density could be decreased. A reduced space requirement of the storage would be advantageous for the integration in a HUC. However, the additional costs of +92.5 % for a volume saving of 5 m³ compared to a conventional 40 m³ water tank are not economically feasible.

From the technical and economic considerations mentioned above it emerges that under these conditions the implementation of a conventional water tank can be considered as the most promising solution.

[2] EASE, EERA, EUROPEAN ENERGY STORAGE TECHNOLOGY DEVELOPMENT ROADMAP, 2017. https://eera-es.eu/wp-content/uploads/2016/03/EASE-EERA-Storage-Technology-Development-Roadmap-2017-HR.pdf (accessed April 1, 2019).

[3] M. Sterner, I. Stadler, eds., Energiespeicher - Bedarf, Technologien, Integration, 2., korrigierte und ergänzte Auflage, Springer Vieweg, Wiesbaden, 2017.

T. Beikircher, Superisolierter Heißwasser-Langzeitwärmespeicher - Abschlussbericht, Technische Informationsbibliothek u. Universitätsbibliothek, 2013. doi:10.2314/gbv:749701188.

[4] T. Beikircher, Vakuumsuperisolation (VSI): Stand der Forschung und Entwicklung zu höchsteffizienter Dämmung und Wärmespeicherung im Gebäudebereich sowie in der energieeffizienten Industrie, (2017). https://www.hs-karlsruhe.de/fileadmin/hska/EIT/Aktuelles/seminar_erneurbare_energien/Sommer_2017/Folien/29032017VSIBeikircher.pdf (accessed July 22, 2019).

[5] M. Rottmann, Isolierung von Hochtemperatur-Wärmespeichern, (2019).

[6] T. Beikircher, Superisolierter Heißwasser-Langzeitwärmespeicher - Abschlussbericht, Technische Informationsbibliothek u. Universitätsbibliothek, 2013. doi:10.2314/gbv:749701188.

Water tank storages are a mature and cost-efficient technology. Therefore, they are widely used in the residential and district heating sector. Water tank storages could be seen as state-of-the-art for storing thermal energy.

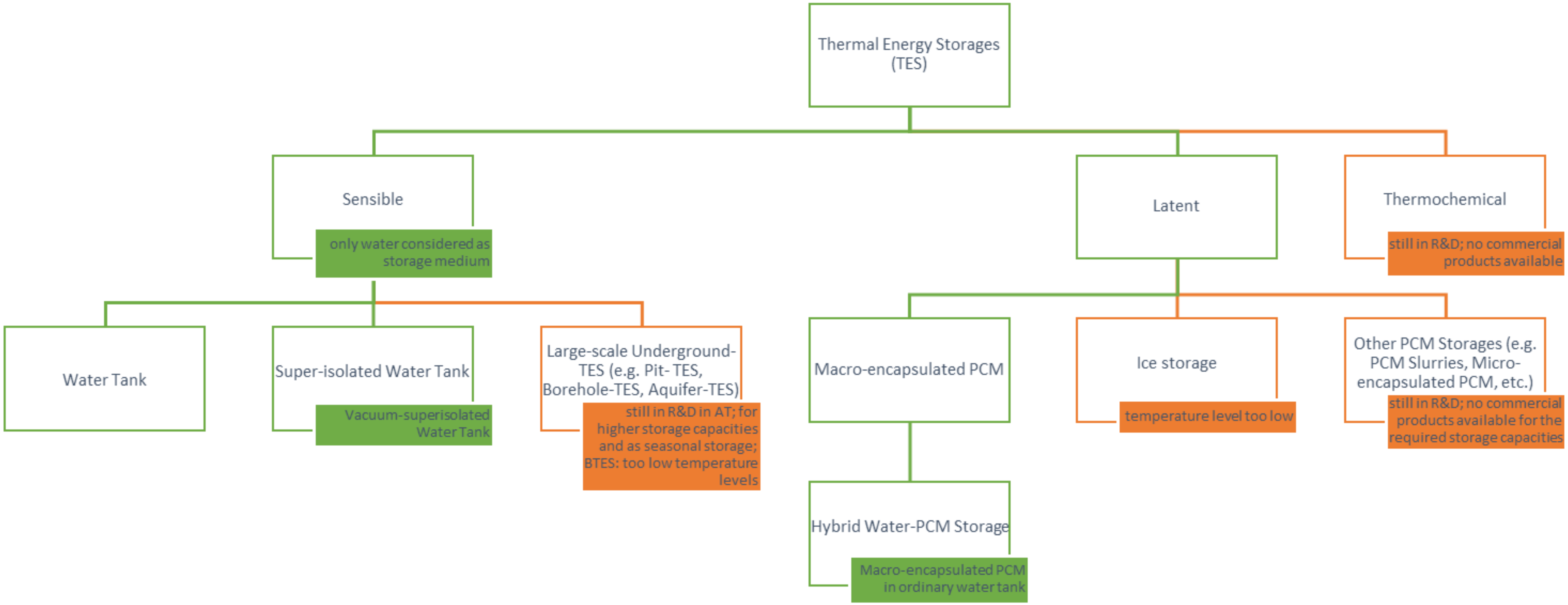

Figure 1. Storage possibilities for the biomass heating plant Weizberg. Red: Not-feasible. Green: Feasible.

2.5. According to legislation

The area of the heating plant (Gst. Nr. 1185/1, KG 68266 Weiz, EZ 2153) in the historical city centre of Weizberg is located in a protected area according to the zoning plan (see Figure 2). In Austria, the protection of historic sites and monuments in historic urban centres or other districts is subject to the Building[7] and Regional Planning Act[8] of the Länder and the Austrian Monument Protection Act[9]. In this context, the preservation of the local image and of historical monuments in the respective local image protection zones[10] is preserved by a local image expert in the context of building permits. Structural changes in protected areas therefore require a building permit including a positive assessment of the protected area.

Figure 2. Excerpt from the zoning plan for the focus area Weizberg (Source: zoning plan No. 1.0 - Stadtgemeinde Weiz, as at: 26.09.2019, Original: http://www.weiz.at/files/stadt-weiz/dokumente/Verordnungen/fwp_weiz_kl_1.pdf)

The planned extension for the accommodation of a heat storage tank, a machine room, a switch room, a retaining wall as well as the associated changes in the terrain on the southwest side of the boiler house, behind the laying-out hall, thus directly influence the existing townscape. Therefore, the following requirements have to be fulfilled by special structural measures due to the approval situation:

a) The aim should be to implement the building, mostly underground, below ground level,

b) Utilization of existing buildings to cover the extension and associated restrictions regarding the dimensions of the extension,

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

d) Minimally invasive integration, in order not to influence existing natural conditions such as trees and bushes.

The innovative structural integration of the storage facility in the historic urban centre, which is protected as a landscape protection zone, is intended to meet all these requirements and to ensure that

[7] https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=LrStmk&Gesetzesnummer=20000070
[8] https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=LrStmk&Gesetzesnummer=20000069
[9] https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10009184
[10] http://www.umwelt.steiermark.at/cms/beitrag/10025584/686638/

the extension blends in unobtrusively with the overall view and does not have any negative effects on the landscape.

3. Status quo of the proposed HUC

According to the land use plan of the municipality of Weiz, the parish on the Weizberg is a protected landscape and historic monument site. Figure 2 shows the parish buildings including the basilica as a protected historic building and the red open spaces as a protected landscape. As can be seen in Figure 2, Figure 3 and Figure 4, the existing biomass heating plant and the newly planned water buffer tank are located exactly in this protected area.

Figure 3. View of the existing biomass heating plant to the west

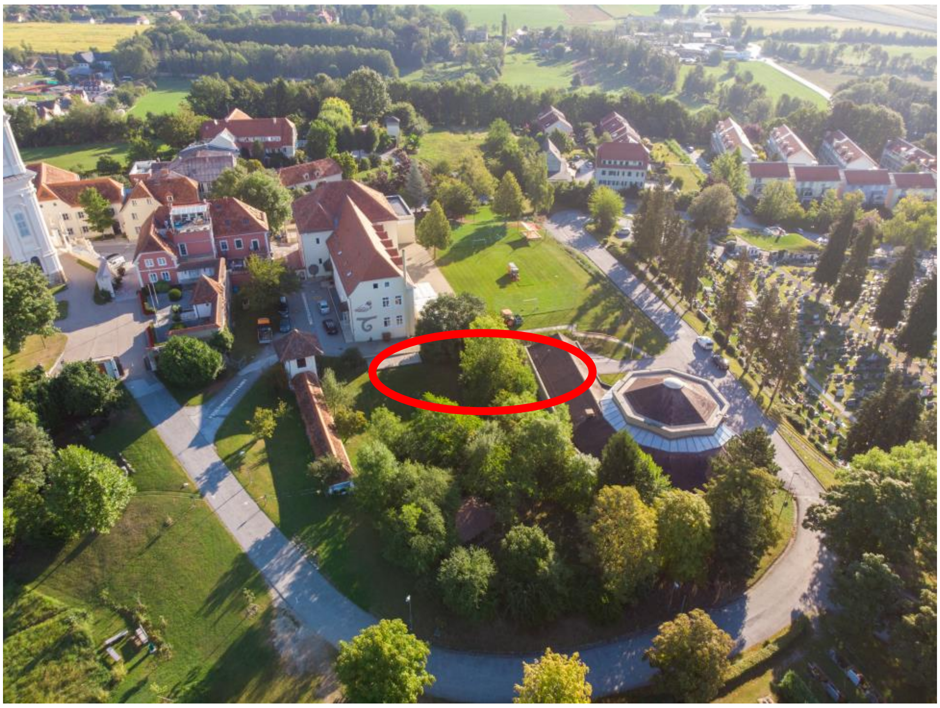

Figure 4. View of the existing biomass heating plant to the north

The local heating network and the heating plant of the cooperative "Biomasse Heizwerk Weizberg reg. Genossenschaft mbH" was established in 1999. The heat supply of the local heating network with 12 customers is ensured by two biomass boilers fired with wood chips. The largest customers are a hotel and the parish of Weizberg. The plant is currently operated without a storage tank and without an additional oil or gas boiler as failure safety. Characteristic values for the heating network and the boiler plant can be found in Table 1 and Table 2.

The high return temperatures of the local heating network have optimisation potential. For this reason, optimisation measures (renewal of the heat exchangers, hydraulic balancing, renewal of the control system, etc.) to reduce the return temperatures should also be carried out at the second largest customer (Weizberg parish). Further optimisation measures (additional DHW storage tank and heat exchanger, optimisation of the control system, etc.) are planned for the largest customer (hotel operation).

Table 1. Characteristic values of the heating network

Heat network				
Number of heat customers	12	[-]		
pipeline length	773	[trm]		
installed load	917	[kW]		
Heat quantity sold (2017/18)	1,457	[MWh]		
temperatures	Winter (Oct-Apr)		Summer (Mai-Sep)	
forerun	85	[°C]	80	[°C]
return	62	[°C]	66	[°C]
mean spread	23	[°C]	14	[°C]

Table 2. Characteristic values of the boiler plant (2 wood chip boilers)

Boiler plant		
Nominal power	840	[kW]
boiler 1	300	[kW]
boiler 2	540	[kW]
Used wood chips (2017/18):	1,896.3	[srm];
	417.68	[atr. to]
	22.8	[% F]

4. Short specification / description of the pilot:

Within the framework of this project, an extension to the existing boiler house is to be carried out to accommodate a heat storage tank, a machine room, a switch room, a retaining wall and the associated terrain changes. In addition, a water buffer tank with a storage volume of approx. 38 m^3 is to be installed. All these measures are to be carried out in compliance with the legal licensing situation and in accordance with the conditions of monument and local image protection law. As initial planning approaches show, these requirements could be met by a dome-shaped construction of the upper part of the storage tank, which only partially exceeds above the ground level, and by an "inconspicuous" façade adapted to the surroundings.

4.1. Technical specification

In addition to the storage, the required peripheral components such as piping, expansion system, grid pump, heat meter and control/EMS system with visualisation and data recording will be newly installed or renewed, respectively.

The newly implemented storage in accordance with the newly implemented control and EMS system will raise the flexibility of the local heating grid. This enables two new essential operating modes:

- Load balance: The boiler plant can be operated at an advantageous higher base load range instead of continuously at a low fluctuating partial load.
- Peak-load covering: Individual load peaks especially in autumn and spring can be covered by the storage. Therefore, the start-up of an additional boiler, operating at low loads, can be avoided.

As a result, the following positive effects can be achieved:

- Increasing the efficiency of the biomass boilers → primary energy savings (biomass savings) → CO_2 saving through lower energy consumption for the provision of the wood chips (production, transport, etc.)
- Lower pollutant emissions (carbon monoxide (CO), dust, NOx and volatile organic hydrocarbons (C_nH_m))
- Increasing the service life of the components → Significant saving of ecological resources that would result from early complete renewal of the boiler plant
- More dynamic operation of the local heating grid possible → Consumers can be operated more quickly with the required supply temperatures
- Extension of maintenance intervals → lower maintenance costs

4.2. Economical specification

Additional investments arise mainly due to the implementation of the storage tank in a historic urban centre, the associated difficulties and cost-intensive structural requirements. However, these must be compared with the positive environmental effect achieved for historic urban centres, which are only made possible by this additional investment.

In energy terms, the water buffer storage tank used is a proven technology and can be regarded as the most cost-effective solution compared with other storage technologies due to the high number of charging cycles (almost daily complete charging and discharging of the storage facility). 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 (see also Table 3):

(1) 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.)

(2) Lower pollutant emissions (carbon monoxide (CO), dust, NO_x and volatile organic carbon compounds (C_nH_m))

(3) Increasing the service life of the plant components → Significant saving of ecological resources that would result from early complete renewal of the boiler plant.

(4) 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

(5) Extension of maintenance intervals → Lower maintenance costs

(6) More dynamic operation of the local heating network possible → Consumers can be served more quickly with the required flow temperature

(7) 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 3. Calculated fuel and pollutant savings

		before	afterwards
Fuel energy used	[MWh]	1,781.76	1.688,19
Saving	[MWh]	93.56	
	[%]	5.25	
Quantity of fuel used [11]	[srm]	1,869.10	1.770,95
Saving	[srm]	98.15	
	[%]	5.25	
Saving CO_2-equivalent emissions [12]	[t/a]	1.50	
Reduction of pollutants[13]			
- **CO**	[kg/a]	294.89	
- **NO_x**	[kg/a]	43.28	
- **Dust**	[kg/a]	27.28	
- **C_nH_m**	[kg/a]	59.62	
Theoretical CO_2-savings[14]	[t/a]	29,10	

[11] Calculation basis: Hu=953.27 kWh/srm (25% atro) [**Fehler! Textmarke nicht definiert.**].

[12] 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 [**Fehler! Textmarke nicht definiert.**], [3] and [**Fehler! Textmarke nicht definiert.**], after the emission factors from the literature show very high ranges of fluctuation.

[13] 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 [3].

[14] 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 [3].

4.3. SWOT Analysis

Strengths	Weaknesses
- Increased efficiency (primary energy savings) - Lower pollutant emissions - Higher flexibility of heating grid - Higher customer satisfaction - Lower maintenance costs - Mature and cost-efficient storage technology - Fully implemented in local energy concepts - Experience of executing companies	- Higher planning costs due to implementation in a HUC - Higher investment costs due to implementation in a HUC - Special structural requirements due to implementation in a HUC
Opportunities	**Threats**
- Export concept to other HUCs in Austria and Europe - Best-practice plant in terms of implementing storages in HUCs - Increasing energy efficiency and share of RES of HUCs	- Additional permits due to monument and local image protection laws

Figure 5. SWOT analysis.

4.4. Financing plan

Table 4 shows an indicative cost breakdown of the planned measures.

Table 4. Estimated costs of the planned measures

Cost position	Costs [€]
1 buffer storage tank	43,000
2 Heating - piping	30,000
3 EMS Control system	15,000
4 Electrical installation	12,000
5 Emergency heating centre and water preparation	7,000
6 Construction costs for boiler room extension	120,000
7 Planning and tendering	15,000
Total incl. VAT	242,000

4.5. Legal framework conditions

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

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 tank, 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.

Necessary documents:

(1) Building decision or building approval

  - Executed by a local historic building expert
  - Already accepted

4.6. Action plan / roadmap

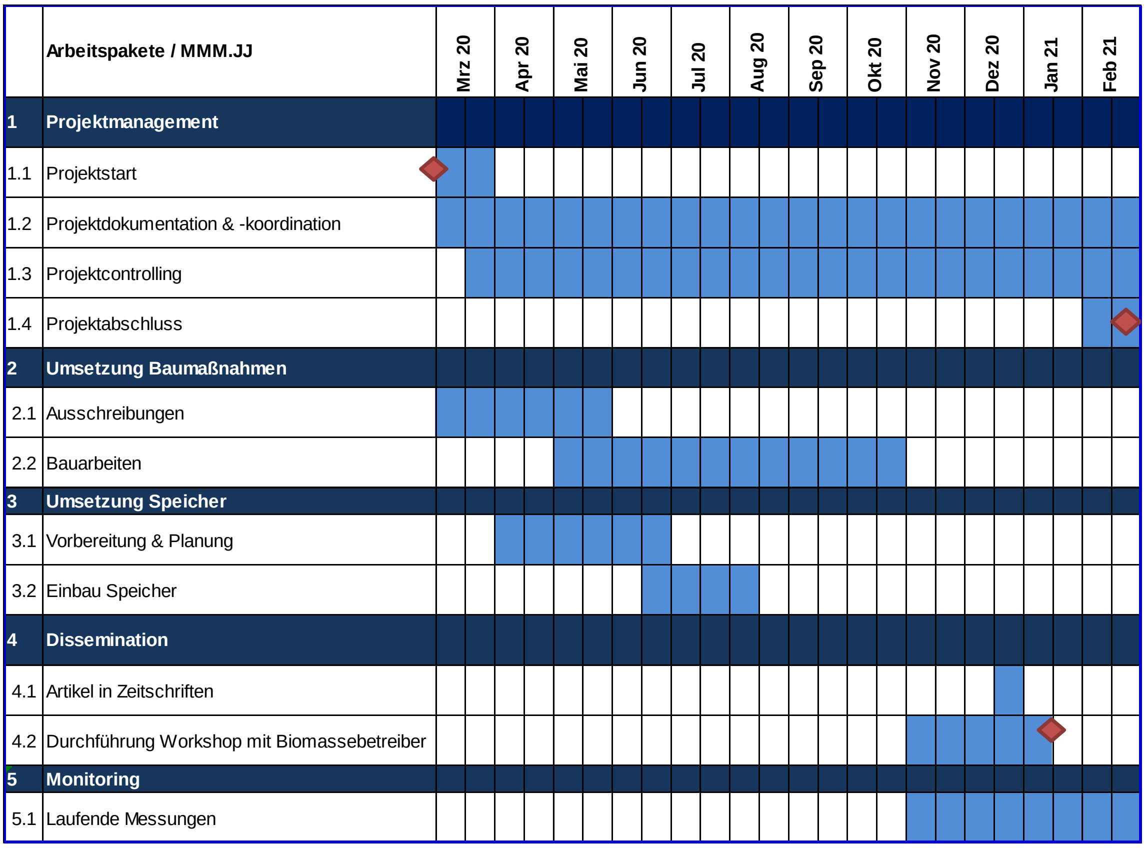

Figure 6. Timetable (Gantt-Chart) in German regarding the project implementation

5. Collected feedback / summary

Due to the chosen, innovative approach, it is possible to integrate the existing biomass heating plant as well as the planned water buffer tank into the overall view of the historic urban centre. This can show that large thermal energy storage systems will be a technically and economically viable option for the future supply of heat and cooling in buildings or districts that are protected by local and historical monuments, especially with regard to the integration of renewable energy sources. The result is that, according to the Weizer model, the integration of a biomass district heating plant including heat storage at numerous locations in the listed districts and thus in the Weizer districts can be made possible by an integrated construction method of the plant.

In Austria there are currently 44 cities with historic city centres. In addition, 26 monuments are listed in Weiz and 38,367 in Austria. In view of these figures, there is broad agreement among the stakeholders involved to continue along the path taken. However, the most important critical points are the integration into the landscape and the resulting additional costs that are necessary due to the additional planning. Since the pilot plant is not supported by investment grants from Store4HUC, external grants for the planned plant are an important objective of the participants and will be further investigated. Hence, the planning phase is in progress. There is agreement on the construction of the water buffer tank. The next step will be an investment specification.