

Improving the performance of District Heating Systems in Central and Eastern Europe

Pilot projects

Report on local working groups

Republic of Croatia

Horizon 2020 (H2020-EE-2017-PPI)
Project N°784966



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement N°784966.



This project received co-funding from the German Federal Ministry of Economic Cooperation and Development.

PROJECT INFORMATION

Lead partner for the deliverable	North-West Croatia Regional Energy Agency (REGEA)
Document type	Report
Dissemination level	Public
Date of submission	September 15, 2020
Author(s)	Velimir Šegon, REGEA Marko Čavar, REGEA
Reviewer(s)	Stefanie Schaedlich, GIZ George Stiff, ICLEI Tihomir Capan, UNIZAG FSB

List of Abbreviations

AT	Austria
CEE	Central and Eastern Europe
CoM	Covenant of Mayors for Climate and Energy
CZ	Czech Republic
DisComEx	Dissemination, Communication and Exploitation
DG	Directorate-General of the European Commission
DHS	District Heating System
EBRD	European Bank for Reconstruction and Development
EU	European Union
GHG	Greenhouse Gas
HR	Croatia
KPI	Key Performance Indicator
LV	Latvia
LWG	Local Working Groups
NGO	Non-Governmental Organisation
RES	Renewable Energy Source(s)
SI	Slovenia
SRB	Serbia
UKR	Ukraine
WP	Work Package

Summary of the project

The project “KeepWarm - Improving the performance of district heating systems in Eastern Europe” is funded under the EU Horizon 2020 programme. Its objective is to accelerate cost-effective investments in the modernisation of District Heating Systems (DHS) in Central and Eastern Europe (CEE). KeepWarm is most active in seven countries: Austria (AT), Croatia (HR), Czech Republic (CZ), Latvia (LV), Serbia (SRB), Slovenia (SI) and Ukraine (UKR). The project focuses on this region, and these particular countries, because in most cases DHSs are frequently still inefficient and for the most part overly reliant on fossil fuels (especially gas, coal or oil).

The aim of this initiative, launched in April 2018, is to modernise DHSs around the whole region in a more sustainable manner. By improving system operations and promoting a switch to less-polluting sources, like renewable energy sources (RES), KeepWarm will contribute to reducing greenhouse gas (GHG) emissions. The eleven project partners strive to ensure that best practices for environmentally-friendlier heating and cooling will be taken up across Europe, replicating KeepWarm’s approach in other countries and regions, even beyond the end of the project in September 2020.

Project objectives

KeepWarm’s specific objectives are:

- At least 450 relevant stakeholders with increased capacities on technical, organisational, financial and managerial aspects – includes 150 DHS operators;
- At least 95 **DHS operators** are able to **develop business plans** and to identify the most suitable **financial model** for modernisation of their own DHS;
- At least 23 **business plans for the modernisation** of DHSs have been developed and **sources for investment** have been identified;
- DHS network **retrofitting** is addressed in at least 10 local **energy plans** and 7 regional or **national strategies** or plans;
- At least 23,300 **relevant stakeholders** (directly) and 125,000 (indirectly) **reached** across Europe in order to **replicate the project outputs** in primary and secondary target regions and ensure the project’s impact;
- **Support EU policies and initiatives**, such as the Covenant of Mayors for Climate and Energy (CoM) and DecarbHeat, by exploiting key lessons from KeepWarm activities and pilots to disseminate best practices across Europe.

KeepWarm consortium partners

LOGO	PARTNER NAME	SHORT	COUNTRY
 giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH	Deutsche Gesellschaft für internationale Zusammenarbeit (GIZ) GmbH	GIZ	Germany
	University of Zagreb Faculty of Mechanical Engineering and Naval Architecture	UNIZAG FSB	Croatia
	Landeskammer für Land- und Fortwirtschaft in Steiermark	LWK	Austria
	Regionalna Energetska Agencija Sjeverozapadne Hrvatske	REGEA	Croatia
	Jožef Stefan Institute Energy Efficiency Centre	JSI	Slovenia
	ICLEI European Secretariat GmbH	ICLEI Europe	Germany
	Teplarenske Sdruzeni Česke Republiky	TSCR	Czech Republic
	Biedriba Zemgales Regionala Energetikas Agentura	ZREA	Latvia
	Zavod Energetska Agencija za Savinjsko Salesko in Korosko	KSSENA	Slovenia
	LLC KT-Energy Consulting	KT-Energy	Ukraine
	Institut za Nuklearne Nauke Vinca	VINCA	Serbia

Content

List of Abbreviations	2
Summary of the project	3
Project objectives.....	3
KeepWarm consortium partners	4
Content	5
Executive summary.....	6
Introduction	8
Local working group – meeting 1.....	9
Local working group – meeting 2.....	13
Local working group – meeting 3.....	16
Local working group – meeting 4.....	19
Local working group – meeting 5.....	22
Local working group – meeting 6.....	26
Local working group – meeting 7.....	28
Local working group – meeting 8.....	31
Local working group – meeting 9.....	33
Local working group – meeting 10.....	36
Local working group – meeting 11	39
Future activities of local working groups	42

Executive summary

The switch from a fossil fuel and inefficient DH system to clean and renewable alternatives with low level of losses is a challenging task. Moreover, other competitive heating solutions in heating sector make it difficult for other heating alternatives, such as DH to compete. Besides DH systems often were not able to provide appropriate value of their services from technical, environmental, societal as well as economic perspective. In other words, DH systems are often in a difficult position due to many reasons. As a result, they often lack of ambitious plans and performing relevant activities such as development of feasibility studies, complicated public procurement procedures, evaluation of RES potential, successfully negotiation with both existing and future end-consumers, identification and application to both local/regional/national and EU funds (lack of investment strategy). On the other hand, they often lack work force and capacity to achieve ambitious plans due to lack of financial funds or know-how. To foster modernisation of above-mentioned DHSs, the KeepWarm project focuses on modernisation of pilot DH systems in 7 partner countries (Austria, Croatia, Czech Republic, Latvia, Slovenia, Serbia and Ukraine).

Project partners committed to provide support to DHSs representatives throughout an interdisciplinary approach with the aim of achieving investments developed in previous activities of projects such as feasibility studies, business plans and selection of pilot DHSs. After identification of current state and barriers which hinder successful investments, the KeepWarm consortium organised local working groups in each country with the aim of providing tailor-made assistance to remove barriers. The goal of the local working groups was to include all relevant stakeholders, which can be identified through the stakeholder analysis, to provide input for business plan development and feedback on future retrofitting plans as well as on barrier removal for DHS. This report is created as country-by-country overview of organised local working group meetings with the aim of presenting systematic and continuous activities of KeepWarm partners toward DHSs representatives and other stakeholders with the aim of achieving investments. In addition to this, each project partner used a tailor-made KeepWarm approach which is a result of previously taken activities such as feasibility studies, business plans and selection of DHSs to be retrofitted.

In case of local working groups in Croatia, 11 meeting were taken place which were attended by 78 stakeholders. The main outcome can be described as a decision-making process by HEP Toplinarstvo to invest into solar thermal collectors (solar energy).

DHS Zaprešić: Implementation of scenario 2 - integration of solar energy.

DHS Samobor: Implementation of scenario 2 - integration of solar energy.

DHS Velika Gorica: Implementation of scenario 3 - integration of solar energy

Based on this decision, REGEA and UNIZAG FSB organised a series of meetings with relevant stakeholders in order to achieve investments. In other words, manufacturers and designers of the technology has been identified, contacted and successfully included, as well as public authorities which are essential stakeholders in terms of land usage, construction permits and potential public end-users which are the main focus of HEP

Toplinarstvo. The decision to invest into solar energy is derived from the above mentioned KeepWarm approach. It should be mentioned that due to the pandemic situation (COVID-19), most of planned and already organised meeting have been cancelled and adjusted to virtual platforms which definitively hindered implementation of scenarios.

LOCAL WORKING GROUP MEETING 1
Pilot: DHS Samobor, DHS Zaprešić, DHS Velika Gorica Number of stakeholders: 6 Main topics: Intro to LWG, Feasibility studies, Integration of solar energy, twinning programme
LOCAL WORKING GROUP MEETING 2
Pilot: DHS Samobor, DHS Zaprešić, DHS Velika Gorica Number of stakeholders: 6 Main topics: Feasibility studies, integration of solar energy, life-cycle assessments
LOCAL WORKING GROUP MEETING 3
Pilot: DHS Samobor, DHS Zaprešić, DHS Velika Gorica Number of stakeholders: 10 Main topics: Solar energy, development of additional studies, negotiation with manufacturers
LOCAL WORKING GROUP MEETING 4
Pilot: DHS Samobor, DHS Zaprešić, DHS Velika Gorica Number of stakeholders: 4 Main topics: primary factors for DH sector, communication with public authorities, twinning activities
LOCAL WORKING GROUP MEETING 5
Pilot: DHS Zagreb Number of stakeholders: 5 Main topics: Intro to LWG, pipeline renovation project, twinning activities
LOCAL WORKING GROUP MEETING 6
Pilot: - (Karlovac) Number of stakeholders: 9 Main topics: promotion of KeepWarm project, SECAP Karlovac (promotion of DH sector)
LOCAL WORKING GROUP MEETING 7
Pilot: DHS Velika Gorica Number of stakeholders: 14 Main topics: Connection of public end-users, integration of solar energy, SECAP Velika Gorica
LOCAL WORKING GROUP MEETING 8
Pilot: DHS Samobor, DHS Zaprešić, DHS Velika Gorica, DHS Zagreb Number of stakeholders: 8 Main topics: Legislation on DH sector, synergy with the building sector, expert group meeting
LOCAL WORKING GROUP MEETING 9
Pilot: DHS Samobor, DHS Zaprešić, DHS Velika Gorica Number of stakeholders: 4 Main topics: Pilot projects development, external financial funds, twinning programme, inspire events
LOCAL WORKING GROUP MEETING 10
Pilot: DHS Samobor, DHS Zaprešić, DHS Velika Gorica Number of stakeholders: 5 Main topics: public procurement, communication with public authorities, external financial funds

LOCAL WORKING GROUP MEETING 11

Pilot: DHS Samobor, DHS Zaprešić, DHS Velika Gorica

Number of stakeholders: 11

Main topics: feasibility studies, public procurement process, long-term strategy, inspire events

Introduction

As defined in the Grant Agreement, this deliverable N°4.2 Report on local working groups is closely tight with the work package 4's objective – achieve at least 15 DHS investments in at least 5 countries, using suitable technical and financial approaches (developed in Work Package 3), which will lead to increased efficiency and RES use. Throughout the task 4.2 Support to DH operators/owners to remove barriers and achieve investments, it is stated in the Grant Agreement that the main objectives are to provide a tailor-made support, remove barriers and achieve above mentioned investments.

The specific topics and focus of the conducted meetings were defined based on the needs of each DHS operator/owner and related stakeholder which is defined throughout the Task 4.1 Selection of DHS for retrofitting, investments and working groups. Working groups are established for each DHS to be retrofitted and include at least representatives of DHS operators/owners, local government and end consumers (and possible other key stakeholders if needed). The local working groups are responsible for the implementation and monitoring of the DHS retrofits. KeepWarm partner were mainly facilitator, discussion leader and triggering reflections and provide support in planned actions

In addition, the working groups will consider results of the Work Package 3 in order to provide an adequate support to secure investments:

- Supporting choices in the optimal financial approach and business model (combination of public and private capital, financing schemes like on-bill financing and similar)
- Support and guidance in preparation and application for potential grants (for example, EU structural funds through the Integrated Territorial Investment mechanism, and others)
- Supporting negotiations with customers (joint meetings with project partners as facilitators)
- Support on specific technical issues (in addition to the ones analyzed in WP3)
- Support with legal issues (e.g. unclear ownership/responsibilities of heating substations)
- Exchange with twins – and including lessons learnt
- Conclusions for future scenarios – long-term orientation

The outcome of Task 4.2 is the realisation of 15 actual investments in DHS retrofits. Therefore, this document presents steps taken towards the above-mentioned goal through the activity of local working groups in terms of identification of problems, discussions, exchange of knowledge, remove of barriers and proposing relevant solutions.

Local working group – meeting 1

General Info

SHORT INFORMATION ABOUT THE LOCAL WORKING GROUP MEETING	
Country	Croatia
Pilot city name	Zaprešić, Samobor, the city of Velika Gorica
Date	October 16, 2019
Location	HEP Toplinarstvo, Miševečka 15a, 10 000 Zagreb
Number of participants/ Stakeholder groups	2 participants from HEP Toplinarstvo 2 participants from REGEA 2 participants from UNIZAG FSB
Topic(s)	Local working groups – introduction Feasibility studies Integration of solar energy in pilot DH projects Twinning activities Development of pilot projects
Minutes by	Marko Čavar

Agenda



Date: 16.10.2019

Location: HEP Toplinarstvo, Miševečka ulica 15A, 10 000 Zagreb

08:30 Arrival

08:45 Start of first Local Working Group meeting

- Feasibility studies Samobor, Zaprešić, Velika Gorica
- Future development of feasibility studies
- Explanation of local working groups
- Introduction of twinning programme and selected twins for Croatian pilot projects
- Future investment plans



Minutes and main Conclusions

Since all feasibility studies have been finalised, REGEA and UNIZAG FSB shortly presented scenario analyses which deal with connection of heating stations into a single DHS network and evaluate the possibility for renewable energy integration (solar energy). This has been evaluated to determine impacts on flexibility of heating systems.

HEP Toplinarstvo and REGEA agreed on sending created studies as a beginning of implementation process. HEP Toplinarstvo will validate costs, scenarios and suggest modifications.

Since local working groups (LWG) have to be established, REGEA shortly presented the main purpose of the LWG. Those groups aim to support the pilot cities Samobor, Zaprešić and the city of Velika Gorica as well as the DHS operator/owner (HEP Toplinarstvo) in achievement of investments, coordination of “Twinning” programme, production of additional studies and negotiations with future customers.

Today’s meeting is the first meeting of the LWG where HEP Toplinarstvo presented plans for future work and available funds for connection of heating systems and integration of solar thermal energy. HEP Toplinarstvo presented plans for all three pilot projects, while plans for expansion of existing DHS network will be furtherly discussed between REGEA and HEP Toplinarstvo. Moreover, the twinning programme has been shortly described along with the twin partners.

The participants agreed on future meetings with a company called Solar TVP from Switzerland which will maybe be engaged in implementation of solar energy together with representatives of local (Samobor, Zaprešić, the city of Velika Gorica) and regional (the Zagreb County) authorities regarding installation of solar thermal collectors on roofs of city’s gym in Samobor, field area in Zaprešić and parking place in the city of Velika Gorica.

Twinning activities

Since twin partners has just been decided, REGEA and UNIZAG FSB shortly reminded HEP Toplinarstvo about twin activities which will take place in the next project period. Firstly, REGEA presented twin partners (Šabac, Velenje and Nova Varoš) which will be contacted soon through project partners from Slovenia and Serbia. Furthermore, HEP Toplinarstvo and project partners have started to discuss about documents which will be shared with twin partners. This is done to prepare both sides on data collection and document creation. Lastly, the national Inspire Event has been discussed. It has been decided to set a date for the event in the next couple of weeks.

At the last Steering Committee Meeting in Ljubljana 09.2019, the following twin cities have been identified:

Velika Gorica – Šabac (Serbia)

Samobor – Velenje (Slovenia)

Zaprešić - Nova Varoš (Serbia)

The participants agreed on sending all necessary information to HEP Toplinarstvo regarding twin cities. In accordance with the project and agreements between project partners, dates of visits to twin cities will be announced.

Information about the twins

DHS Šabac uses natural gas and has an input energy of 233 TJ and a CO₂ emission of 13,071 tonnes per year. 218 TJ of heat is produced annually, of which 197 TJ is delivered to customers. There is no production from renewable energy sources. The town of Šabac has a population of about 50,000 and is located about 70km south of Novi Sad and 90 km west of Belgrade, on the banks of the Sava River. Their plan is the transition to renewable energy since the entire CTS network has been recently refurbished.

DHS Velenje uses coal as a fuel with an input energy of 1,250 TJ and an average annual CO₂ emission of 126,250 tonnes. About 1,100 TJ of heat is produced annually, of which 845.6 TJ is delivered to final consumers. The town of Velenje is in the central part of Slovenia, halfway between Ljubljana and Maribor. It is 120 km northwest of the town of Samobor.

DHS Nova Varoš uses extra light fuel oil and biomass as energy sources for district heating. Annual energy input is 37.89 TJ of fuel oil and 3.77 TJ of biomass. In terms of CO₂ emissions, 2.933 tonnes are emitted annually. Annual energy production is 32.19 TJ, while 28.97 TJ is delivered to final consumers. The municipality of Nova Varoš is located 280 km south of Belgrade, 190 km southeast of Sarajevo and 30 km south of Zlatibor Mountain.

Monitor of retrofit implementation steps

HEP Toplinarstvo presented their plans to begin with creation of project documentation and to start the discussion with relevant stakeholders, who have an influence on achievement of investments.

Samobor

The connection of heating stations in Samobor has a questionable feasibility since the connection pipeline would be too long causing significant investment. In addition, the area around the predicted connection pipeline is highly populated by private households which cannot be connected to the DHS network due to lack of competitiveness of district heating in Croatia. HEP Toplinarstvo wants to evaluate the feasibility of solar thermal collectors (and thermal storage) integration on roofs of the city gym and the nearby high school in Hebrangova.

Zaprešić

Currently, there is an ongoing retrofit project of an existing heating station Trg Mladosti 10. Furthermore, another ongoing project focuses on a connection pipeline between heating stations Mokrička 61 and Mihanovićeveva 28 to improve the optimisation and decommission boilers in Mihanovićeveva 28. A feasibility study will be made for evaluation of solar energy integration and thermal storage integration in Mokrička 61. This study will include the contribution of the Solid TVP. HEP Toplinarstvo decided to evaluate the possibility of

integrating a large scale solar thermal field and connect it to the main heating station Mokrička 61 to meet the necessary requirements for DHS in current/future nearly-zero energy buildings (nZEB). This has been decided since HEP Toplinarstvo has a constant loss of customers because of very competitive individual heating options. This study will include the contribution of the Solid TVP and will be attributed effort of the KeepWarm project.

Velika Gorica

HEP Toplinarstvo has an ongoing project for creation of a single DHS network in the city of Velika Gorica. The first phase is currently performed where DHS Cibljanica will be created – connection of a heating station J. Dobrile 40a and nearby heating stations. The next phase will connect the existing DHS Galženica and the future DHS Cibljanica.

Generally, two conceptual designs will be made in cooperation with HEP Toplinarstvo. These documents will be made based on Life-Cycle Assessments and a Master Thesis which will be produced by UNIZAG FSB. Therefore, the first step of retrofit implementation was to make a decision about the investment which has been already done – HEP Toplinarstvo decided to implement a small-scale project – solar thermal collectors. These solar collectors will be installed on boiler room J. Dobrile 40a (rooftop). This project will include installation of solar collectors on nearby parking place as well. This demands cooperation with local public authorities – REGEA will contact the city of Velika Gorica.

Local working group – meeting 2

General Info

SHORT INFORMATION ABOUT THE LOCAL WORKING GROUP MEETING	
Country	Croatia
Pilot city name	Zaprešić, Samobor, the city of Velika Gorica
Date	November 5, 2019
Location	HEP Toplinarstvo, Miševčka 15a, 10 000 Zagreb
Number of participants/ Stakeholder groups	2 participants from HEP Toplinarstvo 2 participants from REGEA 2 participants from UNIZAG FSB
Topic(s)	Feasibility studies Life-cycle assessments Integration of RES in DH (collaboration with TVP Solar)
Minutes by	Marko Čavar

Agenda

HEP TOPLINARSTVO



Date: November 5, 2019

Location: REGEA
Andrije Žaje 10, 10 000 Zagreb

08:45 Arrival

09:00 Start of Local Working Group meeting

09:00 – 10:00 Pilot projects – TVP Solar (Marko Čavar – REGEA)

10:00 – 10:30 Feasibility studies (Andrej Majdiš – HEP Toplinarstvo)

10:30 – 11:30 Life-cycle Assessments (Tihomir Čapan – UNIZAG FSB)



Minutes and main conclusions

In order to access the overall potential for modernisation of all three DHSs, HEP Toplinarstvo, REGEA and UNIZAG FSB have agreed on developing a long-term plan for each pilot project. Therefore, life-cycle assessments will be carried out in a future cooperation (beyond the project period if needed). These assessments require a large amount of input which will be coordinated by REGEA. Apart from the data collection which will be gathered in the following period, HEP Toplinarstvo will be assisted to create a long-term plan for each pilot (25 years). These long-term plans will be based on the business plans created in the KeepWarm project. REGEA will assist HEP Toplinarstvo on future legislation changes in terms of buildings' retrofit (such as EBRD) which directly influence on DHS market – general goal is to create DHSs with a high share of renewable energy source which will be perceived as a very competitive heating option.

After agreeing on future plans and finalizing necessary data collection, UNIZAG FSB and REGEA will create initial life-cycle assessments which will include all necessary investments in terms of boiler replacements, especially in the business-as-usual scenario. This part is necessary to show the investment potential for solar energy which can be directly used instead of replacing already inefficient and environmentally unfriendly technologies, mainly natural gas.

The second half of the meeting was dedicated to the feasibility studies created in WP3 of the KeepWarm project. HEP Toplinarstvo shared its feedback on each study which will be taken into account in the business plans.

Twinning activities

This meeting did not include any activities focused on twinning.

Monitor of retrofit implementation steps

At the beginning of the meeting, REGEA presented initial plans for the pilot cities developed in pre-negotiation with TVP Solar. This step derives from the previous meeting when rough pilot projects' locations were set in each city. The pilot projects will consist of pre-feasibility, feasibility and engineering study which will give an overall picture on potential for solar energy integration in all three DHSs. As a part of cooperation, TVP Solar will give a short education on solar collectors and their application in DHSs with the aim of capacity building. When it comes to further development of pilot projects, REGEA and UNIZAG FSB will assist in the future period when a cooperation with TVP Solar should take place.

In short, three pilot projects will be observed.

Velika Gorica

This pilot project will include evaluation of solar energy integration in the boiler room Cibljanica (J. Dobrile 40) through a feasibility study which will give calculations on three different scenarios (rooftop integration, metallic structure integration on the nearby parking lot and open solar collectors' field). Future steps will be agreed on after an initial meeting with TVP Solar.

Zaprešić

In case of the pilot project Zaprešić, initial plans are to assess the potential for solar energy integration on a green field area next to the boiler room Mokrička. Since HEP Toplinarstvo has on-going projects (connection of one boiler room to the boiler room Mokrička), feasibility studies will include several scenarios which will focus on meeting future heat demand and evaluating the maximum area of solar collectors for a feasible operation of DHS Zaprešić. Future steps will be agreed on after an initial meeting with TVP Solar.

Samobor

Since HEP Toplinarstvo opted out for postponing investment into connection of boiler rooms in the city of Samobor, a potential for solar energy integration will be evaluated on location of the local boiler room Hebrangova which is a part of the city's gym. A feasibility study will include several scenarios (gym's rooftop, nearby green fields, nearby high school's rooftop with the possibility for connecting to the grid and large-scale implementation on a nearby green field). Future steps will be agreed on after an initial meeting with TVP Solar.

Local working group – meeting 3

General Info

SHORT INFORMATION ABOUT THE LOCAL WORKING GROUP MEETING	
Country	Croatia
Pilot city name	Zaprešić, Samobor, the city of Velika Gorica
Date	January 21, 2020
Location	REGEA, Andrije Žaje 10, 10 000 Zagreb
Number of participants/ Stakeholder groups	4 participants from HEP Toplinarstvo 2 participants from TVP Solar 3 participants from REGEA 1 participant from UNIZAG FSB
Topic(s)	Integration of RES in DH sector Solar energy (solar thermal collectors) Development of feasibility studies
Minutes by	Marko Čavar

Agenda

HEP TOPLINARSTVO



Date: January 21, 2020

Location: REGEA
Andrije Žaje 10, 10 000 Zagreb

08:45 Arrival

09:00 Start of Local Working Group meeting

09:00 – 09:10 Welcome speech (Velimir Šegon – REGEA)

09:10 – 09:30 KeepWarm presentation (Marko Čavar – REGEA)

09:30 – 11:00 KeepWarm pilot projects (Mario Marjanović – HEP Toplinarstvo; Local Boiler Plants)

11:00 – 11:30 DHS Osijek (Ivica Mihaljević – HEP Toplinarstvo; DHS Osijek)

12:30 – 14:00 Solar District Heating Systems (Florent Saunier and Gilbert Farina – TVP Solar)

14:00 – 16:00 Integration of solar energy in Croatia (Marko Čavar – REGEA, Florent Saunier – TVP Solar)



Minutes and main conclusions

This meeting of Local Working Group is the first of several meetings with the aim of starting the collaboration between HEP Toplinarstvo and the Swiss company TVP Solar on implementation of solar energy in Croatian pilot cities.

Firstly, REGEA shortly presented the KeepWarm project and the current progress in order to give a context of the project work and activities to TVP Solar. One of the main activities was the creation of the feasibility studies for each pilot city where HEP Toplinarstvo, UNIZAG FSB and REGEA cooperated in terms of solar energy integration and development of a single DHS network in all three cities.

Afterwards, HEP Toplinarstvo gave a short overview of its DHSs which participate in the project with the aim of information dissemination to TVP Solar. This was an important part of the meeting since TVP Solar gathered important information which will be used in future calculation. This meeting was attended by DHS Osijek representatives (owned by HEP Toplinarstvo) which joined in order to acquire basic information about solar energy as a potential solution for the decarbonisation of the mentioned DHS.

First activity by TVP Solar was to give a detailed presentation of its product – vacuum solar collectors in order to provide an explanatory education (capacity building) for solar collectors' technology. This part is essential towards a proper understanding of technology and better evaluation of its feasibility.

A main part of the meeting was carried out at the end when HEP Toplinarstvo and TPV Solar with the assistance of REGEA started to collaborate on future plans for all three pilot cities. An initial agreement on pilot projects' locations were given. This part will be followed by data gathering process and necessary legal procedures since HEP Toplinarstvo is a nationally owned company which obliges standard procurement procedures. Simultaneously, REGEA will start its communication with public authorities regarding building permits and other administrative procedures.

Twinning activities

This meeting did not include any activities focused on twinning.

Monitor of retrofit implementation steps

During the meeting, HEP Toplinarstvo and REGEA presented the pilot project cities with the main technical and financial parameters, as well as the desired plans for investments. This activity was taken with the aim of providing necessary information for TVP Solar in order to create first proposals for locations of solar thermal collectors' fields in each city.

Velika Gorica

Based on the presented current situation, HEP Toplinarstvo and TVP Solar agreed on developing a feasibility study for boiler room Cibljanka (address: J. Dobrile 40A, Velika Gorica) which will include several scenarios as agreed with HEP Toplinarstvo on a previous

meeting. REGEA will assist HEP Toplinarstvo in data collection by filling a template provided by TVP Solar. Moreover, REGEA will supervise the collaboration, manage activities and provide all necessary documentations.

Samobor

Based on the presented current situation, HEP Toplinarstvo and TVP Solar agreed on developing a feasibility study for boiler room Hebrangova (address: Andrije Hebranga 26, Samobor) which will include several scenarios as agreed with HEP Toplinarstvo on a previous meeting. REGEA will assist HEP Toplinarstvo in data collection by filling a template provided by TVP Solar. Moreover, REGEA will supervise the collaboration, manage activities and provide all necessary documentations.

Zaprešić

Based on the presented current situation, HEP Toplinarstvo and TVP Solar agreed on developing a feasibility study for boiler room Mokrička (address: Mokrička 61, Zaprešić) which will include several scenarios as agreed with HEP Toplinarstvo on a previous meeting. REGEA will assist HEP Toplinarstvo in data collection by filling a template provided by TVP Solar. Moreover, REGEA will supervise the collaboration, manage activities and provide all necessary documentations.

Local working group – meeting 4

General Info

SHORT INFORMATION ABOUT THE LOCAL WORKING GROUP MEETING	
Country	Croatia
Pilot city name	Zaprešić, Samobor, the city of Velika Gorica
Date	February 3, 2020
Location	HEP Toplinarstvo, Miševečka 15A, 1000 Zagreb
Number of participants/ Stakeholder groups	2 participants from HEP Toplinarstvo 1 participant from REGEA 1 participant from UNIZAG FSB
Topic(s)	Factors of primary energy for DH Communication with public authorities Inspire events and study visits
Minutes by	Marko Čavar

Agenda



Date: February 03, 2020

Location: HEP Toplinarstvo
Miševečka 15A, 10 000 Zagreb

07:45 Arrival

08:00 Start of Local Working Group meeting

Overview of previous Local Working Group meeting (1) (Marko Čavar – REGEA)

Factors of primary energy for DH sector (Mario Marjanović – HEP Toplinarstvo)

Communication with public authorities (Andrej Majdiš – HEP Toplinarstvo)

Overview of other National Inspire Events in KeepWarm project (Marko Čavar – REGEA)

Croatian National Inspire Event (Marko Čavar – REGEA)

Organization of joint meeting during site visits (Andrej Majdiš – HEP Toplinarstvo)

Twinning activities (Marko Čavar – REGEA)



Minutes and main conclusions

This meeting is a follow up of the first local working group meeting, in which, apart from the collaboration with TVP Solar on feasibility studies for integration of solar energy in DH systems, HEP Toplinarstvo would like to assess factors of primary energy used in national legislation for DH sector since these factors are used in calculations of energy renovations of buildings. Due to the existing factors, the DH sector appears to be in a very unfavourable situation in comparison to other heating options, especially individual natural gas/biomass boilers. Therefore, UNIZAG FSB and REGEA will collaborate with HEP Toplinarstvo on an official proposal for relevant stakeholders (Croatian Regulatory Energy Agency – HERA, Ministries, local and regional self-government units) to re-evaluate factors, especially for cogeneration plants.

Apart from these factors, HEP Toplinarstvo expressed its intentions to communicate with public authorities in the pilot cities Samobor, Zaprešić and Velika Gorica to strengthen its collaboration in terms of the development of strategic plans for the DH sector. The communication should include negotiation in terms of existing and future public end-users, presentation of plans for integration of solar energy, discussion about necessary permits, grid expansion and inclusion of DH sector in SECAP documents. This process will be led by REGEA, while UNIZAG FSB will assist in technical and legislative aspects. More details are given in subchapter Monitor of retrofit implementation steps.

REGEA and UNIZAG FSB presented general ideas regarding the Inspire Events in all partner countries with the aim of performing preparatory activities. Furthermore, REGEA introduced future activities in terms of Business Plan Canvas, twinning activities between selected twin DHSs such as study visits which will take place during the Inspire Events and initial preparatory activities for the Inspire Event in Croatia which should take place in April 2020 in Zagreb. More details are given in subchapter Twinning activities.

Twinning activities

As mentioned above, each partner will have an Inspire Event in collaboration with its pilot projects (and DHSs representatives). The Inspire Events will take place in the next period. HEP Toplinarstvo agreed to participate in person in all events and expressed their intentions to participate on meetings with representatives of DHS Šabac and DHS Nova Varoš due to similar situation regarding existing technologies and natural gas consumption optimisation. In this light, REGEA and HEP Toplinarstvo will finalize a list of participants which will attend in all meetings since REGEA has to reserve flight tickets and accommodation. Furthermore, HEP Toplinarstvo agreed to prepare presentations for the Inspire Event in Slovenia. REGEA will assist the whole process.

The Croatian Inspire Event should take place in April 2020 as part of a national renewable energy conference in collaboration with the Croatian Chamber of Economy. REGEA presented the general agenda, participants, and main highlights relevant for HEP Toplinarstvo such as study visits, presentations of Croatian pilot projects and twinning exchange between partners and their pilot projects. In this light, HEP Toplinarstvo agreed on organizing a meeting in HEP Toplinarstvo's headquarter (Miševčka 15A, Zagreb) and

host partners and pilot projects from Slovenia and Serbia, as well as from Ukraine and Czech Republic. A main goal of this meeting is to present the current situation and plans regarding integration of solar energy, renovation of distribution network and achieving energy transition towards low-carbon DH sector.

Since each DHS created a business plan in collaboration with the respective project partner throughout WP3, REGEA presented the business plans of twinned DHSs Šabac, Velenje and Nova Varoš with the aim of receiving feedback from HEP Toplinarstvo. REGEA and HEP Toplinarstvo agreed to exchange comments via email and telephone conferences in the next period to create the business plans for the Croatian pilot projects which will be then provided to other twin partners via online google form (business model HEP Toplinarstvo put REGEA in charge for this process).

Monitor of retrofit implementation steps

In terms of achieving investments, HEP Toplinarstvo and REGEA are waiting for TVP Solar to produce first initial calculations and provide an overview of necessary activities. Since both, REGEA and HEP Toplinarstvo, are public institutions/companies, public procurement processes will have to take place. REGEA will be in charge of preparatory activities and will assist HEP Toplinarstvo.

Apart from the feasibility studies, HEP Toplinarstvo expressed its intention to communicate with the public authorities in all three cities on local and regional level in order to fulfil several goals.

Regarding grid expansion and connection of potential new public end-users, REGEA and HEP Toplinarstvo will prepare a list of potential end-users which are close to the existing grid. Moreover, HEP Toplinarstvo will evaluate the possibility to expand their grid if public authorities find the DH sector attractive enough as their heating option.

HEP Toplinarstvo's plans for integration of solar energy are in line with sustainable development of all three cities.

A discussion about relevant building, land, and other permits in order to achieve investments in solar thermal collectors took place. Moreover, REGEA and HEP Toplinarstvo will try to negotiate with public authority to either buy or rent necessary green field to install solar collectors.

A discussion about existing and future legislation in terms of promotion of the DH sector in strategic documents such as SECAPs where both, REGEA and HEP Toplinarstvo, will try to include DH as a sustainable and secure heating option, was part of the meeting.

Local working group – meeting 5

General Info

SHORT INFORMATION ABOUT THE LOCAL WORKING GROUP MEETING	
Country	Croatia
Pilot city name	Zagreb
Date	February 11, 2020
Location	HEP Toplinarstvo, Miševečka 15A, 10000 Zagreb
Number of participants/ Stakeholder groups	3 participants from HEP Toplinarstvo 1 participant from REGEA 1 participant from UNIZAG FSB
Topic(s)	Local working groups - introduction Pipeline renovation project DHS Zagreb Twinning activities – overview of twins National inspire events
Minutes by	Marko Čavar

Agenda

HEP TOPLINARSTVO



Date: February 11, 2020

Location: HEP Toplinarstvo
Miševečka 15A, 10 000 Zagreb

12:15 Arrival

12:30 Start of Local Working Group meeting

Introduction of Local working group methodology (Marko Čavar – REGEA)

Renovation of DHS Zagreb (Daniel Bizek – HEP Toplinarstvo)

Twinning activities in the KeepWarm project (Marko Čavar – REGEA)

National Inspire Event in other countries (Marko Čavar – REGEA)

Croatian National Inspire event (Marko Čavar – REGEA)



Minutes and main conclusions

Firstly, REGEA shortly presented the concept of the Local working groups to representatives of the DHS Zagreb with the aim of strengthening collaboration in terms of providing any necessary support. REGEA and UNIZAG FSB presented current activities performed for the pilot projects Samobor, Zaprešić and Velika Gorica to give an overview of possible activities which can also be conducted in the DHS Zagreb.

Since HEP Toplinarstvo is currently working on a major pipeline renovation project which will be subsidised by the European Commission as a capital project, REGEA and UNIZAG FSB offered their assistance in public procurement processes, in performing additional calculations or in any other activity. HEP toplinarstvo presented the current status of the project and future activities, as well as gathered necessary details which will be used to fill out the business model for DHS Zagreb.

Based on collaboration with the pilot projects Samobor, Zaprešić and Velika Gorica, representatives of the DHS Zagreb would also like to participate in activities regarding factors of primary energy for DH sector since DHS Zagreb is also in unfavourable position in comparison to other heating options. Therefore, REGEA and UNIZAG FSB will include DHS Zagreb representatives in communication and other activities.

Lastly, REGEA presented future twinning activities in terms of the Business Plan Canvas and Inspire Events which will take place in partners' countries, e.g. twinning activities (study visits and exchange of documents), as well as possible communication with public authorities. HEP Toplinarstvo agreed to participate in all activities related to WP6, while assistance with the public authorities will might take place beyond the project period since HEP Toplinarstvo is currently focused on the capital project and have a full support of local and regional self-government units (City of Zagreb County).

Twinning activities

At the last Steering Committee Meeting in Ljubljana 09.2019, the following twin cities have been identified:

Zagreb (Croatia) – Ternopil (Ukraine) – Brno (Czech Republic)

Since twin partners has just been decided, REGEA and UNIZAG FSB shortly presented HEP Toplinarstvo the future twin activities which will take place in the next project period. Firstly, REGEA presented twin partners (Ternopil and Brno) which will be contacted soon through project partners from Ukraine and Czech Republic. Furthermore, HEP Toplinarstvo and project partners have started to discuss about documents which will be shared among the twin partners. This will serve as an input for the Business Plan Canvas which will be disseminated towards the twin partners. HEP Toplinarstvo agreed to send necessary documents to REGEA in order to create the business plan.

Since each DHS created a business plan in collaboration with the respective project partner throughout WP3, REGEA presented the business plans of twinned DHSs with the aim of receiving feedback from HEP Toplinarstvo. REGEA and HEP Toplinarstvo agreed to

exchange comments via email and telephone conferences.

Information about the twins

DHS Brno is one of the oldest DHS in Czech Republic which has been operating since 1930. With over 4,000 customers and relatively obsolete steam pipeline (291 km; owned by DHS), this system will focus on modern economical hot water system and integration of Waste-to-Energy by the end of 2024. The current load is slightly above 1 MW which is produced by 13 natural gas boilers. Brno is located in the South Moravian Region of the Czech Republic and has round 380,000 inhabitants.

DHS Ternopil is a municipality owned enterprise that provides heat supply service to residence, public institutions, and commercial entities (in total 42,000 customers). The yearly heat production is estimated to be 471,600 MWh, produced in 137 boilers which mostly use natural gas. The whole distribution network consists of a 152 km long pipeline owned by the municipality of Ternopil. Regarding future investment plans, DHS Ternopil plans to invest into biomass boilers and the replacement of pipelines to increase the energy efficiency (reduce heat losses).

As mentioned above, each partner will have an Inspire Event in collaboration with its pilot projects (and DHSs representatives) which will take place in the next period. HEP Toplinarstvo agreed to participate in person in all events. In this light, REGEA and HEP Toplinarstvo will finalize a list of participants which will attend in all meetings since REGEA has to reserve flight tickets and accommodation. Furthermore, HEP Toplinarstvo agreed to prepare presentations for the Inspire Events in Slovenia and Czech Republic (REGEA will assist the whole process).

The Croatian Inspire Event should take place in April 2020 as a part of a national renewable energy conference in collaboration with the Croatian Chamber of Economy. REGEA presented the general agenda, participants, and main highlights relevant for HEP Toplinarstvo such as study visits, presentation of DHS Zagreb and twinning exchange between partners and their pilot projects. In this light, HEP Toplinarstvo agreed on organizing a meeting in HEP Toplinarstvo's headquarter (Miševčka 15A, Zagreb) and host partners and pilot projects from Ukraine and Czech Republic, as well as from Slovenia and Serbia. A main goal of this meeting is to present the current situation and plans regarding the pipeline renovation project since it is a capital project in DH sector which received external funds (from the European Commission through structural funds).

Monitor of retrofit implementation steps

Regarding investment plans and retrofit implementation plans, DHS Zagreb decided to invest into the major pipeline replacement (67 km) which will be carried out by HEP Toplinarstvo and external funds through the Operational Programme Cohesion and Competitiveness. This decision derives from a detailed feasibility study (in-house analysis) where three different scenarios have been evaluated.

HEP Toplinarstvo agreed to reach out to REGEA in terms of public procurement processes since numerous activities will have to be carried out by sub-contractors. Moreover, REGAE

offered their consultancy on project management and administration towards the European Commission which will be discussed in a later phase. Furthermore, HEP Toplinarstvo presented necessary information regarding the renovation project in order to provide input for business plans (technical and financial parameters).

In terms of public procurement processes, initial phase of opening tenders for project development, administration and management should be carried out after the project period, while other procedures (i.e. materials, construction works, etc.) will take place later. Meanwhile, REGEA and UNIZAG FSB will carry out additional analyses on heating sub-stations which has been explained in detail in Scenario 2 (Scenario B – replacement of direct heating stations) of the business plan and feasibility study.

Local working group – meeting 6

General Info

SHORT INFORMATION ABOUT THE LOCAL WORKING GROUP MEETING	
Country	Croatia
Date	October 15, 2019
Location	Town Hall Karlovac, Banjavčičeva 9, Karlovac
Number of participants/ Stakeholder groups	1 participant from REGEA 2 participants from UNIZAG FSB 2 participants from the city of Karlovac 2 participants from the DHS Karlovac 2 other stakeholders
Topic(s)	Promotion of KeepWarm project Development of SECAP (inclusion of DH sector) Replication models
Minutes by	Marko Čavar/ Tomislav Novosel

Agenda



Date: October 15, 2019

Location: Town Hall Karlovac

Banjavčičeva 9, Karlovac

08:45 Arrival

09:00 Start of Local Working Group meeting

Introduction (city of Karlovac)

Pentahelix – review of previous meeting (Tomislav Novosel – REGEA)

SECAP Karlovac (Tomislav Novosel – REGEA)

11:00 Break

KeepWarm introduction (Marko Čavar – REGEA)

Pilot projects (Marko Čavar – REGEA)

Future activities (Marko Čavar – REGEA)

Discussion



Minutes and main conclusions

As a part of this meeting, REGEA took an opportunity to present the KeepWarm project and relevant activities for the city of Karlovac since it has a DHS which has similar technical and financial characteristics as pilot projects which participate in the KeepWarm. Therefore, REGEA presented possible activities which can take place after the project period, especially after the replication models will be created in the later phase of the project. In this light, REGEA and UNIZAG FSB agreed with the city of Karlovac's representatives to communicate in the future. In other words, REGEA and UNIZAG FSB will offer technical consultancy, capacity building programme, legal assistance and communicational assistance towards existing and potential new end-users, especially public buildings.

Apart from the technical approach and consultancy, REGEA presented activities related to promotion of DHS in legislative documents such as the SECAP which will be developed by REGEA and UNIZAG FSB for the city of Karlovac. REGEA and the city of Karlovac agreed to gather feedback from relevant stakeholders on action plan for promotion of DHS which will be created in a later phase – communication will be carried out through emails.

Twinning activities

This meeting did not include any activity on twinning.

Monitor of retrofit implementation steps

This meeting did not include any activities on retrofit implementation steps.

Local working group – meeting 7

General Info

SHORT INFORMATION ABOUT THE LOCAL WORKING GROUP MEETING	
Country	Croatia
Pilot city name	the city of Velika Gorica
Date	November 19, 2019
Location	Town Hall Velika Gorica, Šetalište Franje Lučića 15, Velika Gorica
Number of participants/ Stakeholder groups	1 from REGEA, 1 from UNIZAG FSB, 2 from HEP Toplinarstvo, 3 from the city of Karlovac, 1 from the Society for Sustainable Development Design (DOOR), 2 from the local development agency, 1 stakeholder from gas industry, 3 representatives of public end-users
Topic(s)	Connection of potential public end-users Integration of RES in DH sector SECAP
Minutes by	Marko Čavar / Tomislav Novosel

Agenda



Date: November 19, 2019

Location: Town Hall Velika Gorica

Šetalište Franje Lučića 15, Velika Gorica

08:45 Arrival

09:00 Start of Local Working Group meeting

Introduction (city of Velika Gorica)

Pentahelix – review of previous meeting (Tomislav Novosel – REGEA)

SECAP Velika Gorica (Tomislav Novosel – REGEA)

11:00 Break

KeepWarm introduction (Marko Čavar – REGEA)

Pilot project Velika Gorica (Marko Čavar – REGEA)

Future activities (Marko Čavar – REGEA)

Discussion



Minutes and main conclusions

Firstly, REGEA presented the KeepWarm project and the variety of activities which will be carried out until the end of project. The city of Velika Gorica agreed on strengthening the collaboration with the KeepWarm consortium and HEP Toplinarstvo within a DH service in following aspects:

- HEP Toplinarstvo, REGEA and the city of Velika Gorica will collaborate on the evaluation of future potential public end-users which can be connected to the DJ network
- Discussion about solar collectors project and collaboration on obtaining relevant building, construction and land usage permits (metallic construction), as well as discussion about renting of public green fields in order to install solar collectors (if feasibility studies show positive technical and financial parameters)
- Future renovation plans of HEP Toplinarstvo in the city of Velika Gorica (DHS Velika Gorica) – connection of multiple boiler rooms, renovation of pipeline, integration of RES
- Inclusion of DH sector in SECAP Velika Gorica (promotion of DHS)

The city of Velika Gorica and HEP Toplinarstvo agreed on organizing additional meetings which will be specifically focused on above-mentioned activities. REGEA will assist HEP Toplinarstvo in communication and preparation of necessary documentation. In other words, REGEA and HEP Toplinarstvo will reach out to the city of Velika Gorica in a later stage of the project with the aim of achieving investment and changing the legislation in favour of the DHS.

This meeting has been used as an opportunity for HEP Toplinarstvo to promote its service to end-users which were present. A general consensus is that these public end-users can be connected if HEP Toplinarstvo fulfils legislative obligations such as share of renewable energy, lower levelised cost of heat (selling price of heat) and increase energy efficiency. HEP Toplinarstvo stated that these plans are in line with their general investment strategy, while REGEA will assist in the future activities.

Twinning activities

This meeting did not include any activities on twinning.

Monitor of retrofit implementation steps

REGEA and HEP Toplinarstvo presented general investment plans for the DHS Velika Gorica. The initial idea is to select a boiler room Cibljanica (address: J. Dobrile 40a) as a pilot location for which detailed calculations and a feasibility study will be created. The feasibility study will evaluate technical and financial parameters of solar thermal collectors which will be installed on a metallic structure in front of the boiler room.

For this purposes, HEP Toplinarstvo and REGEA agreed to reach out to the city of Velika Gorica in order to check the possibility for obtaining relevant building and construction permit since the parking lot, where the metallic construction is initially planned, is in ownership of the city. The city of Velika Gorica agreed with this investment plan and will be contacted in a later phase of the project.

Local working group – meeting 8

General Info

SHORT INFORMATION ABOUT THE LOCAL WORKING GROUP MEETING	
Country	Croatia
Pilot city name	-
Date	January 28, 2020
Location	REGEA, Andrije Žaje 10, 10 000 Zagreb
Number of participants/ Stakeholder groups	2 participants from Ministries 1 participant from HEP Group 1 participant from the city of Zagreb 3 participants from REGEA 1 participant from Urban Agglomeration Zagreb
Topic(s)	Legislation on DH sector Connection with the building sector legislation
Minutes by	Marko Čavar

Agenda



Date: January 28, 2020

Location: REGEA

Andrije Žaje 10, 10 000 Zagreb

08:45 Arrival

09:00 Start of Local Working Group meeting

Introduction (Miljenko Sedlar – REGEA)

KeepWarm introduction (Marko Čavar – REGEA)

Expert group – main goals (Marko Čavar – REGEA)

Future activities (Marko Čavar – REGEA)

11:00 Break

LC Districts introduction (Miljenko Sedlar – REGEA)

Regional Diagnosis Index (Marko Čavar – REGEA)

Future activities (Miljenko Sedlar – REGEA)



Minutes and main conclusions

This meeting has been perceived as a first meeting of the expert group on legislation which will be used to gather feedbacks from relevant stakeholders on promotion of DHS as a viable and competitive option. Firstly, the KeepWarm project and its relevant activities with the focus on necessary steps from this local working group has been presented.

All stakeholders agreed to provide necessary feedback on the action plan for promotion of DHS in Croatia which will be created in a later phase of the project and disseminated towards the participants. The action plan will consist of detailed analysis of the current situation in DH sector in Croatia, future plans regarding national and regional strategies and a list of proposed measures. The main goal of this expert group is to gather feedback on proposed measures since participants will be very relevant for its implementation such as ministries. The feedback will be provided via email and telephone conferences.

The city of Zagreb and REGEA agreed to identify main barriers which hinder the modernisation process of DHSs in the Urban Agglomeration Zagreb where all pilot projects are located in. Furthermore, the main discussion was carried out regarding the connection of the DH sector and building sector since more and more energy renovations of buildings has taken place in the pilot cities. These activities significantly influence on heat demand and should be properly addressed in legislation such as promotion of low-temperature DHS, integration of RES in DHS, mandatory connection of all new buildings (and refurbished buildings) to DHS if these systems provide adequate renewable heat and renovation of currently inefficient heat distribution network.

Twinning activities

This meeting did not include any activities on twinning.

Monitor of retrofit implementation steps

This meeting did not include any activities on retrofit implementation plans.

Local working group – meeting 9

General Info

SHORT INFORMATION ABOUT THE LOCAL WORKING GROUP MEETING	
Country	Croatia
Pilot city name	Zaprešić, Samobor, the city of Velika Gorica
Date	February 2, 2020
Location	REGEA, Andrije Žaje 10, 10 000 Zagreb
Number of participants/ Stakeholder groups	2 participants from HEP Toplinarstvo 1 participant from REGEA 1 participant from UNIZAG FSB
Topic(s)	Pilot projects development - feasibility studies External financial funds Twinning activities Inspire events
Minutes by	Marko Čavar

Agenda



Date: February 12, 2020

Location: REGEA

Andrije Žaje 10, 10 000 Zagreb

08:45 Arrival

09:00 Start of Local Working Group meeting

Status of business plans (Andrej Majdiš – HEP Toplinarstvo)

Development of pilot projects (Marko Čavar – REGEA)

Data collection (Marko Čavar – REGEA)

Inspire events and twinning (Marko Čavar – REGEA)

|



Minutes and main conclusions

Based on agreed development of feasibility studies for each pilot project, HEP Toplinarstvo, REGEA and UNIZAG FSB agreed to commit themselves to create up to three capital projects, one per each city, which should focus on long-term development of DHSs in terms of heat generation options, grid expansion and connection of new end-users, as well as in terms of creating a single DH network where all boiler rooms would be connected and optimised. These three capital projects will be developed with the aim of potential application to external funds, focusing on the Innovation Funds and securing financial help from the Operational Programme Competitiveness and Cohesion. All three strategies will be derived from existing business plans created through the KeepWarm projects and feasibility studies. REGEA will prepare the groundwork for all activities which will take place by gathering and evaluating feasibility studies, communicating with public authorities on behalf of HEP Toplinarstvo and finally, by evaluating possibilities for application on external funds. During the meeting, HEP Toplinarstvo presented main ideas for each DHS, while REGEA and UNIZAG FSB will assist in the whole process.

Regarding external funds, REGEA and HEP Toplinarstvo agreed to collaborate on future application to external (and internal) financial mechanisms in order to achieve capital investments in all three pilot cities. Most of already identified external funds will take place during next year which leaves enough time for preparatory activities such as development of documentation, finalisation of feasibility studies which will serve as an input and identification of major goals in terms of energy transition towards more sustainable DH sector.

An additional meeting with REGEA will be organised in following weeks on this topic.

Twinning activities

Based on previous meetings' agreements, REGEA and HEP Toplinarstvo finalised business models canvas which will serve for twinning purposes for other (connected) pilots in the project. Also, REGEA gathered feedback on other pilots' business plans which will be input in ICLEI's google form.

Apart from canvases, HEP Toplinarstvo finalised attendance list on each Inspire event and study visits in other participating countries. On behalf of pilot projects Samobor, Zaprešić and Velika Gorica, managing director Mario Marjanović and deputy managing director Andrej Majdiš will attend all Inspire events (Slovenia, Serbia, Ukraine, Czech Republic, Ukraine), as well as on study visits trips which will take place during Inspire Events.

When it comes to Croatian inspire event and study visits, HEP Toplinarstvo finalised plans regarding presentations, selected boiler rooms which will be showed and started negotiating with REGEA regarding necessary twinning activities which should take place such as identification of barriers, presentation of main aspects of HEP Toplinarstvo's business strategy and identification of main legal and legislative barriers which will be used to start discussion panels. REGEA will disseminate necessary information towards project partners and respective DHSs representatives which will attend all events.

Monitor of retrofit implementation steps

HEP Toplinarstvo and TVP Solar agreed on concrete pilot projects' locations for each city, while REGEA and HEP Toplinarstvo gathered necessary technical data such as heat demand, heat production, fuel usage, efficiencies, heat load curves, peak heat demands, fuel prices, as well as other necessary financial data such as labour costs, material costs and investment costs. Apart from the data, HEP Toplinarstvo finalised their requirements for each scenario (scenario descriptions) with the main focus on scenario which achieve share of renewable energy above 30% in order to fulfil existing legislative requirements (each building which undergoes energy renovation process must have at least 30% of energy coming from renewable/sustainable options).

REGEA will prepare necessary documentation for project management and administration which will include overview of activities, necessary steps and future tasks which have to be finalised. Main assistance will be provided in terms of public procurement processes and communication with public authorities regarding land usage, permits and potential end-users.

Local working group – meeting 10

General Info

SHORT INFORMATION ABOUT THE LOCAL WORKING GROUP MEETING	
Country	Croatia
Pilot city name	Zaprešić, Samobor, the city of Velika Gorica
Date	May 12, 2020
Location	REGEA, Andrije Žaje 10, 10 000 Zagreb
Number of participants/ Stakeholder groups	2 participants from HEP Toplinarstvo 3 participants from REGEA
Topic(s)	Public procurement process – feasibility studies Communication with public authorities External financial funds
Minutes by	Marko Čavar

Agenda



Date: January 21, 2020

Location: REGEA
Andrije Žaje 10, 10 000 Zagreb

08:45 Arrival

09:00 Start of Local Working Group meeting

COVID -19 influence (Marko Čavar – REGEA)

Data collection (Marko Čavar – REGEA)

Status of pilot projects (Mario Marjanović – HEP Toplinarstvo)

External financing (Miljenko Sedlar – REGEA)

Inspire events (Marko Čavar – REGEA)

Twinning activities (Andrej Majdiš – HEP Toplinarstvo)



Main conclusions

REGEA presented adjustment of project activities due to COVID-19 lockdown and future consequences in communication. The main change is the adjustment in Inspire Events and Twinning-related events which will be carried out virtually.

Also, several project activities have been hindered due to the same reason. REGEA presented future tasks, mostly focusing on development of feasibility studies and future strategic plans. In relation to this, HEP Toplinarstvo presented the status of pilot projects and adjusted business plans for each city and provided data needed for feasibility studies.

HEP Toplinarstvo initiated the public procurement process for development of feasibility studies which should be finished by the end of August 2020. This activity has been severely hindered due to the COVID-19 lockdown.

Based on current situation and future business plans, REGEA presented possible external financial options which can be used such as the Innovation Fund. HEP Toplinarstvo and REGEA agreed on collaboration for future application of three projects which will take place beyond project period. One of main requirements of these applications are detailed feasibility studies which will be created in next project period.

Since the city of Zagreb and the Zagreb County experienced an earthquake during the COVID-19 lockdown, HEP Toplinarstvo suffered certain technical and operational damage in DH sector which have been set a top priority in several next months. REGEA and HEP Toplinarstvo agreed on collaboration for identification of recovery funds which will be granted to renovate DH network and expand the existing grid.

Twinning activities

Since the COVID-19 changed communicational activities, all events including local working group meetings, inspire events, twinning activities and other stakeholder meetings will be organised virtually. HEP Toplinarstvo agreed to participate in all online events.

REGEA presented general plan of modified Inspire event for Croatia which should take place in November as a first REGEA's conference on renewable energy in district heating sector. In addition, HEP Toplinarstvo will provide a general overview of their pilot projects for the purposes of study visits. During those meetings, twinning activities will be performed in terms of discussion panels COVID-19 influence, business plans, application process to external EU funds and communication.

HEP Toplinarstvo and REGEA agreed on modified (expanded) attendance list on future Inspire events and twinning-related events organised by KeepWarm consortium. The first one will take place in Ukraine.

Monitor of retrofit implementation steps

HEP Toplinarstvo has initiated the public procurement process for development of three feasibility studies. The main topic of these studies has been developed in previous meetings and through communication with TVP Solar. HEP Toplinarstvo has provided detailed data overview and necessary inputs for calculations, while REGEA will start the communication process with public authorities regarding necessary documentation. One of the main expected outcomes is technical and financial parameters of achieving minimum 30% share of renewable in heat generation in all three boiler rooms.

Based on these calculations, further plans will be made and integrated in investment plans of HEP Toplinarstvo. Also, these results will establish a direction for identification of external funds and creation of a detailed long-term development strategy.

Local working group – meeting 11

General Info

SHORT INFORMATION ABOUT THE LOCAL WORKING GROUP MEETING	
Country	Croatia
Pilot city name	Zaprešić, Samobor, the city of Velika Gorica
Date	July 23, 2020
Location	Microsoft Teams online meeting
Number of participants/ Stakeholder groups	3 participants from HEP Toplinarstvo 4 participants from REGEA
Topic(s)	Feasibility studies Development strategies for each city Public procurement process Inspire events
Minutes by	Marko Čavar

Agenda



Date: January 21, 2020

Location: REGEA

Andrije Žaje 10, 10 000 Zagreb

08:45 Arrival

09:00 Start of Local Working Group meeting

Status of feasibility studies (Marko Čavar – REGEA)

Inspire Events and study visits (Marko Čavar – REGEA)

Communication with public authorities (Marko Čavar -REGEA)

Status of business plans (Mario Marjanović – HEP Toplinarstvo)

Data collection (Marko Čavar – REGEA)

Status of pilot projects (Mario Marjanović – HEP Toplinarstvo)



Minutes and main conclusions

REGEA presented the status of feasibility studies and first initial technical parameters. In order to continue to next phase of studies, HEP Toplinarstvo will provide necessary financial parameters which will be included in the calculations. Furthermore, REGEA agreed to provide technical assistance in Samobor and Velika Gorica.

Apart from technical assistance, REGEA presented the plan of future communication with public authorities. Firstly, the city of Samobor and the Zagreb County will be contacted in order to replicate the methodology of meeting which took place in the city of Velika Gorica in previous period. These communication activities are slightly influenced by summer period, but the general idea is to start an intensive collaboration during August.

HEP Toplinarstvo presented current situation in each pilot city in order to modify results of feasibility studies and adjust performed activities such as inclusion of heat storage, desired scenarios, pipeline replacement and connection projects, etc. More details are given in subchapter Monitor of retrofit implementation steps.

Twinning activities

REGEA finalised a general concept for National Inspire event in Croatia which will take place at the beginning of November. HEP Toplinarstvo agreed to participate and provide speakers for technical part of the event, as well as for the purposes of KeepWarm promotion. REGEA agreed on provide additional information, invite attendees, organize necessary infrastructure (webinar) and provide templates.

As a part of this event, HEP Toplinarstvo finalised a general concept for study visits which will be modified in collaboration with UNIZAG FSB and REGEA in the following period. Also, HEP Toplinarstvo provided info about attendance on Ukrainian study visits meeting.

Since all three pilot projects aim to implement same technology by using the similar approach, REGEA and HEP Toplinarstvo decided to develop a replication model/scheme based on the Croatian cases, as well as to expand the basic version with additional investments plans which have been planned to take place in HEP Toplinarstvo's DH networks beyond the project period. These expansions will include the solidification of DH network into a single network, using water tanks and DH distribution network as a heat storage, calculation of rooftop static stability to bear the load of solar collectors.

On the other hand, HEP Toplinarstvo will actively participate in creation of WP4 twinning form which aim to gather experience of HEP Toplinarstvo in achieving investments and mitigating internal/external barriers.

Monitor of retrofit implementation steps

REGEA presented initial calculations on potential solar energy production in each pilot project, as well as detailed methodology for calculation of relevant costs. In addition to this, REGEA will include calculations on static stability of the gym's roof in Samobor and design of metallic construction in Velika Gorica. These two aspects will be covered by REGEA's

in-house knowledge, while HEP Toplinarstvo will provide necessary information of financial parameters.

Further steps include communication with the city of Samobor on following topics:

- Documentation on renovation of gym so REGEA can provide additional calculations
- Land usage permit for installing solar collectors' field behind the gym
- Building and construction permit in case that gym's roof needs to be anchored
- Tender processes – construction work, solar collectors, heat storage
- Connection of nearby public buildings to the DH network

Since the meeting in Velika Gorica has already taken place, HEP Toplinarstvo will contact relevant stakeholders in order to gather data on necessary permits for design and implementation of metallic construction.

Regarding the city of Zaprešić, communicational activities will take place after finalisation of feasibility studies since HEP Toplinarstvo wants to establish a solid strategy as in other two pilot cities before reaching out to stakeholders.

Future activities of local working groups

As the project period comes to its end, there will be additional meetings of local working groups organised in order to continue above-mentioned activities in terms of achieving investments. Most of those meetings will take place virtually due to new working environment influenced by the COVID-19. Since HEP Toplinarstvo and the KeepWarm consortium (REGEA and UNIZAG FSB) set plans for integration of solar thermal energy in all three pilot projects, following activities (meetings) will take place. Most of these meetings will take place until the end of project, but actual investments will probably take place beyond the project period, especially if HEP Toplinarstvo will aim to prepare three capital projects, as discussed in local working group meeting 9.

Meeting with HEP Toplinarstvo – feasibility studies

After finalisation of feasibility studies in next period, REGEA will organize a meeting with HEP Toplinarstvo to discuss results and future steps towards achieving of investments. Future steps are written below:

- Selection of the best scenario for each pilot projects
- Collection of detailed financial data for further calculations
- Heat storage in all pilot projects
- Public procurement for engineering studies
- Communication with public authorities in pilot projects' cities
- Potential end-users
-

Meeting with public authorities (Samobor)

This meeting is a result of continuous work with HEP Toplinarstvo on integration of solar thermal collectors on pilot location – boiler room Hebrangova (address: A. Hebranga 26, Samobor). This meeting will include discussion about:

- Permits
- public procurement processes
- development of SECAP
- promotion of DH sector
- negotiation about potential end-users

Meeting with public authorities (Zaprešić)

This meeting is a result of continuous work with HEP Toplinarstvo on integration of solar thermal collectors on pilot location – boiler room Mokrička (address: Mokrička 61, Zaprešić). This meeting will include discussion about:

- Permits
- public procurement processes
- development of SECAP
- promotion of DH sector
- negotiation about potential end-users

Meeting with public authorities (Velika Gorica)

This meeting is a result of continuous work with HEP Toplinarstvo on integration of solar thermal collectors on pilot location – boiler room Cibljanica (address: J. Dobrile 40a, Velika Gorica). This meeting will include discussion about:

- Permits
- public procurement processes
- development of SECAP
- promotion of DH sector
- negotiation about potential end-users

Meeting with HEP Toplinarstvo – Innovation Fund application

This meeting aims to set a groundwork to apply three pilot projects developed under this project to the Innovation Fund. As explained before, applications require initial feasibility studies which will prove viability of used technologies and reduction of carbon footprint. As a part of this meeting, general overview of financing options will be presented and evaluated in order to find the best possible approach for HEP Toplinarstvo.