

Project No: 691679



***Report on the cooperation with
regulators and heating and cooling
utilities***

WP 3 – Task 3.1 Deliverable 3.1

December 2017



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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 691679. The sole responsibility for the content of this report lies with the authors. It does not necessarily reflect the opinion of the European Union nor of the Innovation and Networks Executive Agency (INEA). Neither the INEA nor the European Commission are responsible for any use that may be made of the information contained therein.

CoolHeating website: www.coolheating.eu

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Abbreviations

DH	District heating
DHC	District heating and cooling
EPBIH	Public Enterprise Electric Utility of Bosnia and Herzegovina
BiH	Bosnia and Herzegovina
ETF	University of Belgrade, School of Electrical Engineering
EU	European Union
GET	Güssing Energy Technologies
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
RES	Renewable energy sources
SDEWES – Skopje	International Centre for Sustainable Development of Energy, Water and Environment
TPP	Thermal Power Plant
USAID	United States Agency for International Development
UNDP	United Nations Development Programme
UNIZAG FSB	University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture

1. Introduction

This report is elaborated as a part of Workpackage 3 of the CoolHeating project. The main goal of this Workpackage is to involve different stakeholders of the target communities in the project activities, including citizens as well as the policy makers, local authorities, utilities, regulators, etc. This will contribute to ensuring the sustained public acceptance of renewable energy projects and renewable energy overall, while taking into account the implications of the substantial increase in the share of renewable energy sources in the final energy consumption.

As a part of Task 3.1, project partners provided continuous knowledge sharing for the representatives of regulatory agencies and heating and cooling utilities of the target communities. Therefore, the main goal of this task was to implement bi-lateral dialogues with representatives of aforementioned stakeholders in the target communities/target countries. The aim was to hold at least 3 meetings in each target community/target country, resulting in at least 15 meetings overall. Target communities of the CoolHeating project are Ljutomer in Slovenia, Ozalj in Croatia, Šabac in Serbia, Karposh in Macedonia and Visoko in Bosnia and Herzegovina. The idea of the meetings was to discuss synergies and areas of cooperation with the regulators and local utilities, therefore facilitating their support for setting up small modular renewable district heating and cooling systems in target communities. This report provides an overview of the bi-lateral meetings held with the representatives of regulators and local heating/cooling utilities, giving the agenda and main conclusions of each event that took place.

2. Meetings with representatives of regulators and heating and cooling utilities in Croatia

In Croatia, two bi-lateral meetings have been held with representatives of Croatian Energy Regulatory Agency, a national regulatory body, and one meeting has been held with the representative of Ministry of Economy – Heating sector. Furthermore, one meeting was held with the representatives of three companies responsible for the development of the cogeneration project in Croatian target city of Ozalj. All the events have been organised by UNIZAG FSB in order to provide a more detailed insight in the project activities and discuss possibilities of further cooperation with these stakeholders.

2.1. First bi-lateral meeting with representatives of Croatian Energy Regulatory Agency

The meeting was held in the city of Zagreb on the 6th of July 2016, at the premises of Croatian Energy Regulatory Agency (Ulica grada Vukovara 14, 10 000, Zagreb). Three members of UNIZAG FSB and three members of Croatian Energy Regulatory Agency attended the meeting. The list of attendees is presented in Table 1, while the signing sheets from meetings in Croatia can be seen in Annex 1.

Table 1. List of attendees of the first bi-lateral meeting with the representatives of Croatian Energy Regulatory Agency

Attendee of the meeting	Organisation which the person represents
Tomislav Pukšec	UNIZAG FSB
Borna Doračić	UNIZAG FSB
Tomislav Novosel	UNIZAG FSB
Tomislav Benčić	Croatian Energy Regulatory Agency
Zrinka Roubin	Croatian Energy Regulatory Agency
Ankica Krušić	Croatian Energy Regulatory Agency

The main goals of Croatian Energy Regulatory Agency are: ensuring objectivity, transparency and impartiality in carrying out energy activities; ensuring the implementation of the principle of regulated access to the network/system; adopting methodologies for determining the heat price in the tariff systems; establishing an efficient energy market and introducing the competition; providing protection for the energy buyers and energy entities. By fulfilling these goals, the Agency promotes efficient and rational use of energy, entrepreneurship in the energy sector, investments in the energy sector and the protection of the environment.

During the meeting, attendees were first introduced to the basic goals of the CoolHeating project, after which they were shown a more detailed description of the concept being implemented in the project. The already developed promotional materials were handed out to all the participants of the meeting, with additional material being delivered in order to disseminate the project to other departments of the regulatory agency. Particular interest was shown for seasonal thermal storage and power-to-heat technologies, being relatively unknown in Croatian terms. Therefore, the meeting resulted in an interesting discussion on these topics, giving the attendees a more detailed insight into these technologies by the representatives of UNIZAG FSB.

Head of the Heat Sector Department of the regulatory agency expressed interest for the project and promised to support all the activities of the project. Finally, UNIZAG FSB invited a

representative from the regulatory agency to join the CoolHeating consortium in study tours in Denmark in September 2016. However, due to busy schedule, it was impossible to have a representative of the regulatory agency at the study tours in Denmark. Nevertheless, the attendees expressed their interest for more detail on the best practice examples, so the second meeting was arranged to be in December 2016, where UNIZAG FSB presented details on district heating plants, which were visited in Denmark during the study tour. It has to be noted that UNIZAG FSB maintained continuous contact with the representatives of the agency after this first meeting, resulting in their attendance to various CoolHeating activities, such as technical training from D4.3, training on innovative business models from D5.5 and a study tour to Güssing.

2.2. Second bi-lateral meeting with representatives of Croatian Energy Regulatory Agency

The second bi-lateral meeting was held in the city of Zagreb on the 6th of December 2016 at the premises of Croatian Energy Regulatory Agency (Ulica grada Vukovara 14, 10 000, Zagreb). Three members of UNIZAG FSB and four members of Croatian Energy Regulatory Agency attended the meeting. The list of attendees is presented in Table 2.

The main idea of this meeting was to give the representatives of the energy agency an overview of the implemented small modular renewable district heating projects in Denmark, being one of the most developed countries in this field. Details of three district heating systems have been presented: in the city of Gram, in the city of Brædstrup and on the island of Samsø. These systems have been selected since they have been visited in person by representatives of UNIZAG FSB, who could share their experience first-hand. Furthermore, all of these systems use some kind of combination of biomass and solar thermal as a heat source, which is rather interesting for Croatia, due to high potentials for these sources in this target country.

Similar to the first meeting, the attendees were interested in the combination of solar thermal and seasonal storage, which was explained to them in detail. Further interest was shown in heat pumps as a solution for district heating. The Handbook on small modular renewable district heating and cooling systems, which was developed as a part of D4.1 and was being translated to local languages at that moment has also been presented. The attendees showed great interest in it, specifically due to its availability in Croatian language. The presentation ended with an interesting discussion on power-to-heat technologies and the integration of heat and power sectors, making use of the hourly price variations on the electricity market for better overall feasibility of the project.

At the end of the meeting, UNIZAG FSB invited a representative from the regulatory agency to join the study tour in Güssing, which they accepted. The study tour was organised jointly by GET and UNIZAG FSB and its idea was to show the citizens of the target city of Ozalj renewable district heating best practice examples and their benefits on the overall systems, as well as their benefits for the local economy. 47 citizens of Ozalj, including the mayor and city council members were present. Furthermore, one representative of Croatian Energy Regulatory Agency was present, along with the designer and investor into the cogeneration plant in Ozalj. The study tour was deemed highly successful.

Table 2. List of attendees of the second bi-lateral meeting with the representatives of Croatian Energy Regulatory Agency

Attendee of the meeting	Organisation which the person represents
Tomislav Novosel	UNIZAG FSB
Borna Doračić	UNIZAG FSB
Tomislav Pukšec	UNIZAG FSB
Tomislav Benčić	Croatian Energy Regulatory Agency
Zrinka Roubin	Croatian Energy Regulatory Agency
Ankica Krušić	Croatian Energy Regulatory Agency
Zlatko Zmijarević	Croatian Energy Regulatory Agency

2.3. Bi-lateral meeting with the representative of Ministry of Economy

The meeting was held in the city of Zagreb on the 2nd of June 2016, at the premises of Ministry of Economy (Ulica grada Vukovara 78, 10 000, Zagreb). Three members of UNIZAG FSB and one member of the Ministry of Economy – Heating Sector Department attended the meeting. The list of attendees is presented in Table 3.

Since policy makers are also a target group of this workpackage, UNIZAG FSB decided to present the CoolHeating project to their representative from the heat sector department. First the basic idea of the project was presented, giving the basic overview. Then the specific objectives have been shown, as well as the concept itself. An interesting discussion followed about the potentials of small renewable district heating implementation in Croatia. The conclusion was that, even the potentials are rather significant, changes in the regulatory and legal framework are needed in order to facilitate the implementation of such systems. Therefore, the necessary changes in the Heat Market Act have also been discussed. This was particularly important since at that moment the new act was in the process of being drafted. The representative of the ministry expressed his support to the CoolHeating project and agreed to follow the project results and the events being implemented, offering their support whenever needed. UNIZAG FSB also disseminated the promotional material of the CoolHeating project in the Heat Sector Department of the Ministry of Economy. The meeting was discussion oriented and was deemed highly successful.

Table 3. List of attendees of the bi-lateral meeting with the representative of the Ministry of Economy – Heating Sector Department

Attendee of the meeting	Organisation which the person represents
Tomislav Novosel	UNIZAG FSB
Borna Doračić	UNIZAG FSB
Tomislav Pukšec	UNIZAG FSB
Boris Makšijan	Ministry of Economy – Heating Sector Department

2.4. Bi-lateral meeting with the representatives of the three companies responsible for the development of the cogeneration project in Croatian target city of Ozalj

The meeting was held in the city of Zagreb on the 15th of December 2016, at the premises of the engineering design company Enerkon (Trnjanska 37, 10 000, Zagreb). Two members of UNIZAG FSB, five members of Enerkon, 1 member of Detono and 1 member of Experto Crede attended the meeting. Enerkon is in charge of the technical design of the biomass cogeneration plant, Detono is the main investor in the project and Experto Crede is responsible for civil works.

The representatives of UNIZAG FSB and the 3 companies responsible for the development of the biomass cogeneration plant in Ozalj first met at the presentation of the aforementioned project to the citizens in the city hall in Ozalj. There they agreed to have a separated meeting to discuss possible synergies between CoolHeating and the cogeneration plant project.

The meeting started with the presentation of basic goals of the CoolHeating project by the UNIZAG FSB partner. Furthermore, a discussion followed on different expansion possibilities for the cogeneration project in Ozalj, taking into account the technical concepts of the CoolHeating project. Also, best practice examples from Denmark have been shown, providing the investors with the new ideas for their project. The presentation continued with the results of the survey carried out as a part of Task 3.4. These results proved to be very useful for the investors since they show the opinion of the citizens towards renewable district heating overall, as well as their energy consumption data. The participants of the meetings agreed on further cooperation between two projects, since CoolHeating can provide contacts and useful data for the development of the biomass cogeneration project and will also encourage regulatory changes needed for easier implementation of such projects in smaller cities. The representatives of 3 companies were also invited to give support to CoolHeating as a part of Task 4.2.



Figure 1. Meeting with representatives of the three companies responsible for the development of the cogeneration project in Croatian target city of Ozalj

3. Meetings with representatives of regulators and heating and cooling utilities in Slovenia

Within the CoolHeating project three meetings with regulators and heating utilities were held. One meeting was held with representatives of the Energy Agency of Slovenia (regulatory body for the supply of heat and other energy gases). Another meeting was held with the Ministry of Infrastructure which is competent for the energy sector of Slovenia. The last meeting was held with KSP – the heating utility company in Ljutomer. All three meetings were organised and implemented in cooperation of two project partners – the Municipality of Ljutomer and Skupina FABRIKA. The purpose of the meeting was to involve the stakeholders in project activities and to promote project activities and outputs. As a positive result of the meetings was the attendance of representatives of the Ministry of infrastructure on the CoolHeating events in Ljutomer and implementation of one presentation on CoolHeating events in Ljutomer by the Ministry of Infrastructure representative.

3.1 Bi-lateral meeting with the representatives of the Energy Agency of Slovenia

The meeting was held in the city of Maribor on the 7th of September 2016 at 10:00, at the premises of Energy Agency of Slovenia (Strossmayerjeva ulica 30, 2000 Maribor). Four representatives of the Energy Agency and a representative of the Municipality of Ljutomer and a representative of Skupina FABRIKA attended the meeting. The list of attendees is presented in Table 4, while the signing sheets from meetings in Slovenia can be seen in Annex 2.

Table 4. List of attendees of the first bi-lateral meeting with the representatives of the Energy Agency of Slovenia

Attendee of the meeting	Organisation which the person represents
Mag. Mojca Španring	Energy Agency of Slovenia
Alenka Domjan	Energy Agency of Slovenia
Ksenija Naglič	Energy Agency of Slovenia
Aleksander Trupej	Energy Agency of Slovenia
Mitja Kolbl	Municipality of Ljutomer
Rok Sunko	Skupina FABRIKA

The Energy Agency is acting under public authorisation, carries out the administrative and other tasks specified in the Energy Act of Slovenia and EU regulations. The Energy Agency performs the following tasks:

- regulation of the network activities, which covers economic regulation of all electricity and gas system operators and the regulation of the network with respect to issuing consents to the general acts
- regulation of the supply of heat and other energy gases
- ensuring a reliable supply of natural gas
- promoting the production of electricity from renewable sources and cogeneration
- promoting efficient use of energy
- monitoring of electricity and natural gas market
- supervising the providers of energy operators' activities
- protecting the rights of consumers

Partners from Skupina FABRIKA and Ljutomer first presented the basic goals of the CoolHeating project, after which they gave a more detailed description of the concept being implemented in the project. In order to increase the dissemination potential of the project, the CoolHeating promotional materials were handed out to all the participants of the meeting.

Representatives showed interest in the CoolHeating project as they already assessed the initial project deliveries that were available at the project website in the time being. They provided some inputs that were used to update contents of the WP2 deliveries especially in the field of regulative in Slovenia and status of DHC in Slovenia.

After that discussion focused on the impacts and expected changes that are a consequence of the new Energy act in Slovenia. The representatives explained the impacts of the new energy act for the Energy agency, which brings the agency greater independence, more powers, new organisation and operation rules. And they also explained the impacts the new energy law will have on procedures and regulations for heating and cooling in Slovenia including the eagerly expected new support scheme for DH.

3.2 Bi-lateral meeting with the representative of Ministry of Infrastructure

The second bi-lateral meeting was held in the city of Ljubljana on the 12th of December 2016 at the premises of the Ministry of Infrastructure - Directorate of Energy (Langusova 4, 1535 Ljubljana). Two representatives of the ministry and one representative of Ljutomer Municipality attended the meeting. The list of attendees is presented in Table 5 while the signing sheets from meetings in Slovenia can be seen in Annex 2.

Table 5. List of attendees of the bi-lateral meeting with the representative of Ministry of Infrastructure

Attendee of the meeting	Organisation which the person represents
Erik Potočar	Ministry of Infrastructure
Jurij Vertačnik	Ministry of Infrastructure
Mitja Kolbl	Municipality of Ljutomer

The Energy Directorate performs tasks relating to the efficient use of energy and to the provision of renewable sources of energy, energy supply, sources of energy and mining. Among others, its key activities include:

- preparation and implementation of national energy policy (energy generation and processing, production, distribution and supply, efficient use and renewable sources of energy for heating and transport);
- implementing measures to achieve energy and climate objectives while ensuring a reliable energy supply at competitive prices, in particular through encouraging the use of renewable energy sources and measures for higher energy efficiency;
- cooperation within bilateral and multilateral regional energy frameworks aimed at providing a stimulating environment for cooperation at national, regional and entrepreneurial levels;
- drafting legislative and other acts for the energy and mining sectors.

Similar to the first meeting, the basic goals of the CoolHeating project were presented by the representative of Ljutomer. This was followed up by a more detailed description of the concept being implemented in the project with special emphasis on the activities related to assessments of national framework conditions in project partner's countries and report on legislation important for DHC.

The Meeting with the Directorate has been primarily aimed for discussion in the light of the new Energy Act in Slovenia, which brings certain changes in the supply of thermal energy and use renewable energy sources in Slovenia, as well as the new support schemes for projects

of district heating from renewable sources. This discussion was a continuation of the discussion at the Energy Agency where some areas of the discussion were designated as “not within the jurisdiction of the agency”. In this regards the discussion was focused also on the expected support schemes for DH projects in Slovenia which were not available during the time of implementation of the new Energy act.

In discussion of national frameworks for DH outside of Slovenia Ministry representatives explained that they are well informed on framework conditions in CoolHeating best practice countries. They are familiar with these frameworks, as in force in other countries. They cooperate with other countries in preparation of Slovenian schemes. Their opinion is that such methods and incentives would be difficult to pass in our environment.

The Ministry showed interest in the CoolHeating project and offered support in implementation of the project events. The already developed promotional materials were handed out to all the participants of the meeting.

3.3 Bi-lateral meeting with the representatives of the KSP Ljutomer d.o.o. heating utility

The meeting was held in the city of Ljutomer on the 23th of November 2017, at the premises of KSP Ljutomer heating utility (Ulica Rada Pušenjaka 9, 9240 Ljutomer). One representative of the KSP Ljutomer heating utility and a representative of the Municipality of Ljutomer attended the meeting. The list of attendees is presented in Table 6, while the signing sheets from meetings in Slovenia can be seen in Annex 2.

Table 6. List of attendees of the first bi-lateral meeting with the representatives of the KSP Ljutomer d.o.o. heating utility

Attendee of the meeting	Organisation which the person represents
Rok Cvetko	KSP Ljutomer d.o.o.
Mitja Kolbl	Municipality of Ljutomer

The KSP Ljutomer d.o.o. is a communal and residential company in ownership of the municipalities in which it is responsible for:

- collection and disposal of municipal waste residues
- real estate management
- management of sports infrastructure facilities
- cleaning services

Within the management of real estates the KSP Ljutomer also acts as the heating utility for 980 flats and houses in Ljutomer municipality. They operate and maintain 16 boilers. Most of the boilers use heating oil, a few newer uses natural gas as the energy source. One of their main activities is waste collection. They transport all of the kind of waste to regional collection plant in Puconci. In the future they might be interested in a potential heating plan based on waste use, but Municipality has first change regulations that obligate them to deliver waste to regional plant. In maintenance of heating plants for the real estate they manage they are also interested in alternative solution for DH and heating of individual objects.

After the presentation of the CoolHeating concept and main results, the utility company showed interest in the project activities and outputs. They are willing to cooperate especially in definition of the heating concept for Cven settlement, they can provide heating needs data for private buildings (school, kindergarten and the culture hall). They also plan to attend the project events especially the events held for the target community in Cven.

4. Meetings with representatives of regulators and heating and cooling utilities in Bosnia and Herzegovina

4.1 First meeting with representatives of institutions active in the heat supply field and related fields in B&H

The round table was held at premises of EPBiH on July 3, 2016. Meeting was attended by representatives of US Agency for International Development - Energy Investment Activity, - United Nations Development Programme, German Society for International Cooperation, CETEOR (Centre for technological, economic and environmental development and Association of thermal power engineers of BiH.

In the introductory part of the Round table the CoolHeating project was presented. After that the representatives of the invited parties gave 15min presentations with basic information about their projects, according to the agenda and the submitted guidelines.

An overview of projects being actively implemented or having already been implemented in BiH in areas identified as areas of interest to the CoolHeating project - energy efficiency, efficient cogeneration, renewable energy sources, is given below:

- Recommendations in the field of energy efficiency - funding schemes and public awareness (USAID, UNDP);
- Implementation of projects in the field of energy efficiency - thermal insulation of buildings, introduction of the EMIS system in public buildings, etc. (USAID, UNDP);
- Development of a building typology for residential buildings (GIZ);
- Development of a building typology for public buildings (UNDP);
- Recommendations on the legal framework in the areas identified as areas of interest to the CoolHeating project - focus: energy efficiency, biomass and biogas (USAID, UNDP, GIZ);
- Recommendations on incentive schemes in areas identified as areas of interest to the CoolHeating project (USAID, GIZ);
- Recommendations in the field of innovative technologies, business models and finance schemes for the heating and cooling sector - focus: trigeneration, waste heat recovery, centralized systems, the use of biomass and biogas (GIZ);
- Recommendations in the field of cogeneration based on the use of biomass and biogas (USAID);
- Project on district heating cogeneration with biomass, through the concept of public-private partnerships (CETEOR);
- Activities related to the Law on communal businesses and Regulations in the field of central heating.

In terms of further activities, the following conclusions were made:

- participants of the Round table recognized common interests and the connection of individual projects with the CoolHeating project;
- participants of the Round table will, within their capabilities, contribute to and participate in the revision of the document on the framework conditions in the field of modular district heating and cooling systems in BiH, which will be prepared as part of work package WP2 - T2.1 of the CoolHeating project;
- participants of the Round table will review opportunities for further actions in the implementation of joint activities, based on work packages of the CoolHeating project;
- new actions will be defined successively, in line with the phases of project implementation.

Table 7. List of attendees of the meeting with the representative of the KJKP Toplane Sarajevo d.o.o

Attendee of the meeting	Organisation which the person represents
Dino Tresnjo	Elektroprivreda BiH
Nijaz Delalić	Mechanical engineering faculty, University of Sarajevo
Azrudin Husika	CETEOR d.o.o. Sarajevo
Hajrudin Džafo	Elektroprivreda BiH
Almir Selmanović	CETEOR d.o.o. Sarajevo
Izet Smajević	Elektroprivreda BiH
Nihad Harbaš	GIZ
Lutz Jarczyński	GIZ
Hamid Mehinović	GIZ
Edin Hadžimusić	USAID
Naida Taso	GIZ
Mak Kamenica	USAID
Elvis Hadžikadić	UNDP
Sanin Mešić	UNDP
Anes Kazagić	Elektroprivreda BiH
Emir Vejzović	Municipality of Visoko
Milada Mataradžija	Municipality of Visoko
Alma Ademović - Tahirović	Elektroprivreda BiH

The signing sheets from meetings in Bosnia and Herzegovina can be seen in Annex 3.

4.2. Second meeting

Second meeting within T3.1 was held with main technical consultant of KJKP Toplane Sarajevo d.o.o.. The aim of this meeting was to introduce the KJKP Toplane Sarajevo d.o.o., one of the largest DH utilities in Bosnia and Herzegovina which produce and supply heat energy from its natural-gas based plants in capital of Sarajevo, with all the details of the CoolHeating project, as well as the benefits of participating municipalities, to exchange information about activities of the development and implementation of projects of heating/cooling in Bosnia and Herzegovina, with a special emphasis on legal framework regulating district heating systems.

KJKP Toplane Sarajevo d.o.o. is the largest district heating company in Bosnia and Herzegovina. It was founded in 1977 and is currently heating over 50.000 apartments and 2.500 associated business premises and facilities connected to the central heating system based on natural gas. Overall capacity which can be covered by KJKP Toplane Sarajevo is cca 350 MWt (in peak loads) while average thermal load is cca 230 MWt. In addition to heat distribution as a main activity, KJKP Toplane deal with: researches in the field of heat production and distribution, designing, supervision in the field of production, servicing and maintenance of plants for the production and distribution of heat energy, elaboration of a proposal for legislation in the field of thermal energy, electricity production CHP units.

Table 8. List of attendees of the meeting with the representative of the KJKP Toplane Sarajevo d.o.o

Attendee of the meeting	Organisation which the person represents
Mustafa Musić	Chief of Department for strategic development EPBiH
Anes Kazagic	EPBiH CoolHeating team leader
Elma Redžić	EPBiH CoolHeating team member
Dino Tresnjo	Department for strategic development EPBiH
Mirzo Hadžialić	Main technical consultant of KJKP Toplane Srajevo d.o.o

EPBiH team has presented the details of the project CoolHeating as well as examples of good practice in Europe and neighbouring countries. The representatives have exchanged information on the current situation in the field of district heating and cooling on the global and local levels.

Representative of KJKP Toplane Sarajevo d.o.o. has introduced EPBiH team with the status and problems of district heating systems in Bosnia and Herzegovina. It is obvious that there is a need for a law on district heating and heat energy systems that would define measures for safe and reliable supply of heat, thermal systems for the use of heat energy for heating and cooling.

Therefore, KJKP Toplane Sarajevo and other district heating companies have drafted text of law on heat energy in the Federation of Bosnia and Herzegovina. The draft law was written by multidisciplinary experts with a huge experience in district heating systems. The law draft was sent to the Ministry of Energy, Mining and Industry of the Federation of Bosnia and Herzegovina for its revision and adoption. The following areas of district heating are going to be regulated with the proposed law: Performing energy activities, Regulatory Commission, Energy permits, Heat production, Supply of heat energy, Purchase and sale of heat energy in buildings with a common heat meter and heat exchangers, User activities, End users, The accounting metering point, Installing the metering devices, Contractual relationship, Heating season, The mode of production and supply of heat energy, The quality of heat for the end user, DH costs and tariff system, Conditions for extracting the end user from the central heating system, Unauthorized use of heat energy and other relevant issues.

Mr. Hadžialić from KJKP Toplane will submit the draft law to EPBiH representatives, so further activities will be undertaken in communication with Federal Ministry of Energy, mining and Industry, with the goal of faster solving the problems in regulating the field of the district heating sector.

4.3. Third meeting

The bilateral meeting was held on November 28, 2017 at premises of JP Visoko Ekoenergija, public municipal gas supplier. The company is currently distributing natural gas in Visoko, but they are also registered for production and distribution of thermal energy from other sources. The idea is that Visoko Ekoenergija takes active participation in commissioning of the future modular district heating system in Visoko.

Table 9. List of attendees of the meeting with the representatives of JP Visoko Ekoenergija d.o.o

Attendee of the meeting	Organisation which the person represents
Abdulah Mataradžija	JP Visoko Ekoenergija d.o.o.
Adnan Handžić	JP Visoko Ekoenergija d.o.o.
Muhamed Husić	JP Visoko Ekoenergija d.o.o.

Edin Šahinović	JP Visoko Ekoenergija d.o.o.
Marin Petrović	Municipality of Visoko
Amra Babić	Municipality of Visoko
Emir Fejzović	Municipality of Visoko

In the introductory part of the meeting the CoolHeating project was presented by the representatives of Municipality of Visoko. Some of the examples of good practice in Europe and neighbouring countries were also presented. The representatives have exchanged information on the current situation in the field of district heating and cooling on the global and local levels.

After that, active discussion was held about support and participation of JP Visoko Ekoenergija d.o.o. in implementation of the project in the role of municipal distributor of thermal energy.

Municipality of Visoko representatives also used this chance to inform the management of Visoko Ekoenergija about the status of ongoing plans with the DH system supplying the heat from TPP Kakanj to Sarajevo and adjacent places. One branch pipeline would be led to Visoko, but the designing phase has shown the need for additional heating solution, which would be provided by renewable energy sources DH system emerging from CoolHeating project.

During questions and closing remarks session, management of Visoko Ekoenergija supported the idea and agreed to offer support to the Municipality in the coming phases of the project.

5. Meetings with representatives of regulators and heating and cooling utilities in Macedonia

Three meetings with the regulators and heating and cooling utilities were organized in Macedonia. The first and third meeting were focused on opening a dialogue with the national and local regulators, while the second meeting was intended to inform a heating utility about the ongoing activities in the CoolHeating project, discuss local barriers and the potential of small modular district heating and cooling grids.

5.1 First meeting

The first meeting with regulators and heating and cooling utilities was held on 2 June 2016. The Ministry of Economy of the Republic of Macedonia, one of the stakeholders of this activity was interested in hosting the event in their building (Yuri Gagarin 15, 1000 Skopje). The aim of the meeting was to join representatives from the Ministry of Economy, the Regulatory Commission of the Republic of Macedonia, the Energy Agency of the Republic of Macedonia, the Municipality of Karposh, the City of Skopje and the utility Toplifikacija AD.

Table 10. List of attendees of the first meeting with regulators and heating and cooling utilities in Macedonia

Attendee of the meeting	Organisation which the person represents
Goran Nikolovski	Ministry of Economy
Vlastimir Trajkovski	Ministry of Economy
Zaneta Petrova	Ministry of Economy
Marko Beslimovski	Energy Regulatory Commission
Vladimir Sarac	Energy Agency
Ljupco Trpkovski	City of Skopje
Ljupco Dimov	Municipality of Karposh
Christian Hartwig	Municipality of Karposh
Vesna Angeleska	Municipality of Karposh
Katarina Manceva	Toplifikacija AD
Goran Dimeski	Toplifikacija AD
Milica Andonov	Ministry of Economy
Verica Tasevska Gjorgievska	RCESD – MASA
Vladimir Gjorgievski	SDEWES – Skopje
Vasil Bozhikaliev	SDEWES – Skopje
Natasa Markovska	SDEWES – Skopje

Having the meeting early on in the project meant that there are no particular results available to present. Nevertheless, the attendees were introduced to the scope of the project and to the

activities that are going to take place. Afterwards, a long discussion followed touching on the national legislation and barriers. It was noted that there is almost no specific legislation targeting the implementation of renewable district heating and cooling grid. Furthermore, the possible hurdles and administrative bottlenecks were addressed for each phase of the project implementation. Ljupco Dimov shared his experience with RES based project in Karposh, but stressed that there is a lot of regulatory ambiguity when it comes to DHC projects.

The stakeholders were acquainted with the fact that one of the expected outputs of the project was to improve the national policies (including better permitting procedures, codes, targets and legislation). It was concluded that future meetings were welcomed in order to discuss these topics in detail and provide input for the policy recommendations.



Figure 2. Meeting with representatives from the regulators and heating and cooling utilities in Macedonia

5.2 Second meeting

The second meeting was held on 13th December 2017 at 14:30. It was aimed at having a close discussion with the heating utility Toplifikacija which were also the hosts of the meeting. There were nine participants present at the meeting, seven of which were from Toplifikacija AD Skopje.

The basic activities of the company Toplifikacija AD Skopje are distribution and production of heat energy, preparation of studies, investment programs and complete technical documentation for thermal energy structures, district heating and gas distribution network, applied scientific research work in the field of thermal energy, construction and installation of district heating and gas distribution, metrology, distribution of natural gas.

Having in mind that representatives from Toplifikacija AD Skopje participated in the first meeting and were introduced to the CoolHeating project, no formal introductory presentation was needed. Ljupco Dimov presented the case of the new neighborhood in Zlokukjani, Karposh and the technical concept for a DHC grid based on heat pumps and solar thermal collectors. The technical possibilities for heat pump utilizing the heat from groundwater was discussed at length.

Table 11. List of attendees of the second meeting with regulators and heating and cooling utilities in Macedonia

Attendee of the meeting	Organisation which the person represents
Ljupco Dimov	Municipality of Karposh
Dimitar Ilievski	Toplifikacija
Vladimir Gjorgievski	SDEWES – Skopje
Petar Urfanov	Toplifikacija
Filip Serafimov	Toplifikacija
Katarina Manceva	Toplifikacija
Kostovska Lile	Toplifikacija
Jovan Janovski	Toplifikacija
Goran Dimeski	Toplifikacija

In light of the developments and changes of the energy legislations in the Republic of Macedonia, a significant portion of the meeting was focused on the discussion of the draft Energy Law and the role of energy auditors in the future.



Figure 3. Meeting with representatives from the heating utility Toplifikacija in Macedonia

5.3 Third meeting

The third meeting with the regulators was held on 15 December (Friday) at 9:30 in the Municipality of Karposh. Ljupco Dimov and Vladimir Gjorgievski, both as representatives of the CoolHeating project, were joined by eight employees of the sector for urbanism of Karposh (Urbanistic sector) among which was the head of the sector, Blagica Blazevska.

The sector for urbanism in Karposh has a variety of obligations and responsibilities such as physical planning, architectural planning, implementation of urbanistic plans, real estate and a procedure for expropriation of real estate. There is a separate department responsible for each of these activities and this is why it was important to organize a meeting with the sector.

Table 12. List of attendees of the third meeting with regulators and heating and cooling utilities in Macedonia

Attendee of the meeting	Organisation which the person represents
Tanja Mishkovska	Sector Urbanism, Karposh
Blazevska Blagica	Sector Urbanism, Karposh
Vesna Stefanova	Sector Urbanism, Karposh
Zorica Spandjeva	Sector Urbanism, Karposh
Ivana Trajkoska	Sector Urbanism, Karposh
Diana Skartova - Georgievaska	Sector Urbanism, Karposh
Ljupco Dimov	Municipality of Karposh
Vladimir Gjorgievski	SDEWES – Skopje
Zorica Kitanova	Sector Urbanism, Karposh

The location for the technical concept in Karposh is a neighbourhood with high outcomes of being built in the near future. Currently, there is a detailed urbanistic plan for this neighbourhood, but it doesn't involve the district heating infrastructure. The meeting with the Sector for Urbanism was intended to discuss this. Firstly, Vladimir Gjorgievski gave a brief overview of what has been achieved in the project so far and where it is standing with respect to future activities. The attendees discussed the current situation in Karposh and the attitude of the citizens towards district heating systems. Then Ljupco Dimov presented the envisioned small renewable district heating system for the new neighbourhood in Karposh. He talked about the steps that needed to be taken in order to achieve this and engaged the representatives of the sector for urbanism in a discussion about their role in the process.

The meeting ended with an optimistic tone as both parties showed intentions to continue the collaboration between the CoolHeating project partner in Macedonia and the sector for urbanism in Karposh.



Figure 4. Meeting with representatives from the Sector Urbanism

6. Meetings with representatives of regulators and heating and cooling utilities in Serbia

The five meetings with regulators and heating utilities were held in Serbia with: district heating utility in Šabac, Serbian energy regulatory agency in Belgrade, district heating utility and electric utility in Sremska Mitrovica, union of heating utilities during their assembly in Zlatibor, and delegates of the energy conference "Energetika 2017" in Zlatibor. The lists of attendees have been given in Annex 5.

6.1. First meetings

The very first meeting was held at the district heating utility "Toplana Šabac", in Šabac on 30th March 2016.



Figure 5 Meeting with district heating utility in Šabac

The meeting objective was to introduce the objectives of the project and to relate the new small heat sources with the traditional existing concept of district heating in Šabac. Also, advantages of integrated smart energy system based on renewable energy sources has been presented.

The representatives of "Toplifikacija Šabac" presented their company, its assets and current utilization. Also, they have shown interest in new concept of small heat sources, having in mind cancelled project proposals.

The next meeting has been arranged at Serbian energy regulatory agency (serb. Agencija za Energetiku Republike Srbije [AERS]) on 10th May 2016.



Figure 6 Meeting with Serbian regulatory agency

The meeting objective was to introduce AERS to the project and to learn about regulation in district heating in Serbia.

The representatives of "AERS" presented current utilization of biomass in Serbian energy balance and national and local energy policy incentives for its increase. Furthermore, the economic situation among national heat utilities and methodology for heat billing were presented. Finally, they have shown interest in the future project activities and proposed the presentation during the district heating union yearly assembly.

6.2. Second meetings

The main presentation to the union of district heating utilities in Serbia (serb. Poslovno udruženje "Toplane Srbije" [PUTS]) was held during their national assembly meeting in Zlatibor on 28th May 2016.



Figure 7 Presentation for union of district heating utilities

The meeting objective was to introduce representatives of district heating utilities with new paradigm of small modular district heating and cooling systems, and the details about project realization in Republic of Serbia.

The representatives of "PUTS" shown interest for the project activities and future cooperation.

Another meeting has been organized on 27th June 2016 with district heating utility in Sremska Mitrovica (serb. Javno komunalno preduzeće "Toplifikacija" Sremska Mitrovica, [JKPT]), and national electric utility representatives (Javno preduzeće Elektroprivreda Srbije, Panonske Termoelektrane-Toplane [JPEPS])



Figure 8 Biomass depot before boiler in Sremska Mitrovica district heating plant

The meeting objective was to present partners, activities and goals of the project, and to learn about first mass application of biomass in district heating in Republic of Serbia.

The representatives of "JKPT" and "JPEPS" presented the energy and business model of cooperation for the case of Sremska Mitrovica heat supply.

6.3. Third meeting

The third meeting with regulators has been organized on 28th March 2017 during the conference "Energetika 2017", in Zlatibor.

The meeting objective was to present partners, activities, goals and newest deliverables of the project, and to discuss about perspectives of development of small modular district heating systems in Republic of Serbia.

The delegates of "Energetika 2017" conference discussed the applicability of the concept within framework conditions in Serbia and possible obstacles in its realization.