



Final Project Conclusions

LowTEMP

Project title		Project duration	
Low Temperature District Heating for the Baltic Sea Region		October 2017 – June 2021	
Priority	Specific objective		
Management of natural resources	Energy efficiency		
Budget	Spent budget	Flagship project	EUSBSR Policy Area/Horizontal Action
3.77 million	3.45 million		
Link to the project library		Link to the project's website	
https://projects.interreg-baltic.eu/projects/lowtemp-112.html		http://www.lowtemp.eu/	
Lead partner (country)		Countries involved	
Istitute of Fluid Flow Machinery, Polish Academy of Sciences (IMPPAN) (Poland)		PL, DE, DK, SE, FI, EE, LV, LT, RU	
Project summary			
Teaser			
The Interreg project LowTEMP brought together 19 partners from nine countries and 30 associated organisations to improve strategic tools on planning, financing, installing and managing Low Temperature District Heating systems allowing to significantly decrease heat loss.			
The challenge			
Modernisation of district heating systems (DHS) is in full swing in the Baltic Sea region, but more needs to be done. The potential in using low temperature district heating systems with a significant decrease in heat loss by using renewable energy and waste as heat sources is not fully unveiled. District heating systems are somehow widesread in the Baltic Sea region, but the current generation of heating grids and technologies is outdated. Furthermore, they often do not comply with latest energy efficiency standards, both in renovated or newly constructed buildings. This leads to pressing challenges such as heat energy losses, hydraulic problems and economic disadvantages.			
Need for an upgrade			
Therefore district heating systems and technologies need to be adapted and upgraded in order to decrease grid heat losses and exploit synergies. The optimisation of district heating grids can be done using low temperature heat distribution. This means that supply and return temperatures should be as low as possible.			
The installation of low temperature grids or its integration into existing district heating systems is a challenge, in particular for economic and technical planning: investments require high upfront costs, while construction works on the pipeline system require the coordination of experts and public authorities.			



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DE	DK	EE	FI	LT	LV	NO	PL	RU	SE

Project's highlights

The highlights present the project's main achievements and results, e.g. change brought for the target groups, pilots or tests carried out, and exemplary transnational work.

19 partners from nine countries and 30 associated organisations gathered together in order to provide district heating stakeholders with know-how and strategic tools on planning, financing, installing and managing Low Temperature District Heating systems (LTDH). The project involved municipal, regional and national authorities, DH suppliers, energy agencies, associations, business support organisations, as well as research institutions.

Boosting implementation with new methodology and training

LowTEMP developed a methodology for strategies to increase energy efficiency in existing and new district heating networks. The methodology provides specific step-by-step guideline on how to develop energy strategy and apply it at municipal level. It contains area analysis, stocks evaluations, analysis of increasing energy efficiency potential, technical preconditions and requirements of district heating, profitability assessment, CO2 balance and monitoring methods.

With 26 modules containing information on strategies and concepts to the best practices, the project provided valuable training material as a basis for training on different possibilities of heating supply, technical and financing issues, as well as corporate development of energy strategies and business models.

Local pilots inspire

The tailored solutions based on the current type of the district heating supply infrastructures, the existing problems and potential for improvement were tested in pilots across the Baltic Sea region. For instance, in Aluksne (Latvia) energy efficiency measures were introduced in a kindergarten in order to prepare for future LTDH system. In Holbaek (Denmark) the pilot implemented a LTDH subnet in a conventional DH network; in Halmstad (Sweden) a low-temperature district heating grid was installed in a completely new residential area; in Gulbene (Latvia) an existing heating network was converted to a low temperature concept, with low temperature heating system, with more efficient wood pellet boiler house and newly constructed heat pipes being provided to some municipal buildings. More about the pilot measures can be found [here](#).

Improved calculations on economic efficiency and business modelling

LowTEMP developed a calculation method, which helps understand the profitability and funding gap of a given district heating project. It is based on the evaluation of the internal rate of return and net present value of an investment over a period of 20 years. It includes an excel based calculation tool,



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a manual and an analysis for more background information on financial framework and funding gaps. The tool allows to calculate investments for grid and/or generating plants.

Additionally, publishing the Study on Business Models and Innovative Funding Structures the project presented a business model on tools based on low temperature district heating. It provides examples of innovative pricing models, new value chains, business opportunities, as well as innovative funding structures. A toolbox and a template of a business model canvas complement the study. The material is developed for district heating companies and municipalities, who want to examine new business opportunities and understand how they could change their business model and funding structure for district heating in a low temperature district heating scenario.

The project wanted not only to prove that district heating upgrades are a necessity to counteract the inefficiency of outdated systems, but also that upgrades are financially profitable for end-users and operators. So further initiatives and investments in smart and sustainable district heating systems should be triggered. LowTemp tools help exactly in this, as they are ready-for-use means to take steps towards improving district heating systems. This is a way on which the pilot municipalities already made steps forward.

The Interreg project LowTEMP used EUR 3.45 million from the European Union to enable the implementation of low temperature district heating. Besides the introduction of new technical and financial strategies, the project has additionally succeeded in strengthening cooperation with H2020 project Cool DH, Halmstad University, HafenCity University, Euroheat & Power which paved the way for new collaborations in district heating.

Main Outputs

The main outputs present the project's main deliveries which are tangible and can be used by others outside the project.

Methodology for strategies to implement Low Temperature District Heating (LTDH)

This methodology provides a step-by-step guideline on how to compile an energy strategy and apply it at municipal level to increase energy efficiency in existing and new district heating networks. It delves into area analysis, stocks evaluations, potentials for increasing energy efficiency and diminishing consumption, technical preconditions and requirements of district heating, profitability assessment, CO2 balance and monitoring methods. The methodology is useful in particular municipal departments in charge of district heating systems, public authorities dealing with energy issues and urban development, heat suppliers and operators of district heating networks, as well as energy agencies/planners.

<https://www.lowtemp.eu/wp-content/uploads/2021/09/Methodology-for-strategies-to-implement-LTHD.pdf>

Training toolkit

The training package contains 26 modules that cover different aspects of planning and applying low-temperature district heating, from background information to strategies and concepts, from



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technical aspects to best practices. For each module, a powerpoint presentation and a handout are available. The training material is mainly for the use of energy agencies responsible for strategic development and implementation of low carbon strategies and measures, cluster agencies and business hubs related to a green economy, municipal representatives responsible for climate issues. The material can be used as a basis for different training formats, for instance, seminars on different possibilities of heating supply, as well as technical and financing issues, but also workshops for the corporate development of energy strategies and business models.

<https://www.lowtemp.eu/training/>

Calculation method on economic efficiency and funding gaps

This calculation method helps understand the profitability and funding gap of a given District Heating project. It is based on the evaluation of the internal rate of return and net present value of an investment over a period of 20 years. It includes an excel based calculation tool, a manual and an analysis for more background information on financial framework and funding gaps. The tool allows to calculate investments for grid and/or generating plants. The method and tool are targeted at district heating operators, investors and funding authorities.

<https://www.lowtemp.eu/what-we-do/>

Business models and innovative funding structures

The Study on Business Models and Innovative Funding Structures is mainly directed to district heating companies, municipalities and regional and national government. The study presents business model developing tools as adapted to low temperature district heating; it provides examples of innovative pricing models, new value chains, business opportunities and new professions, as well as examples of innovative funding structures. A toolbox and a template of a business model canvas complement the study. The target groups for the material are district heating companies and municipalities who want to examine new business opportunities and understand how they could change their business model and funding structure for district heating in a low temperature district heating scenario.

http://www.lowtemp.eu/wp-content/uploads/2020/08/LowTEMP_economic-efficiency-and-funding-gaps-LTDH_V0-9.xlsx

[LowTEMP_Manual-for-determining-economic-efficiency-and-funding-gaps-of-LTDH-projects.pdf](#)

[LowTEMP_Financing_Schemes_and_Business_Models_Analysis-of-financial-framework-and-funding-gaps-1.pdf](#)



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Follow-up/spin-off activities

These include specific new activities that have been inspired by or initiated during the project work and will be continued after its implementation.

- LowTEMP contributed to Tartu city energy and climate action plan for 2030 (“Tartu Energia 2030”) for the chapter which sets the goals for district heating in Tartu by 2030, including pilots and use of LTDH when feasible.
- With the extension stage project LowTEMP 2.0, the training material will be further evaluated via testing sessions and involvement of target groups, translated into local languages and adjusted to national conditions; it will be used for the development of an e-learning programme. It will also be disseminated during national training seminars.
- The municipalities of Gulbene (Latvia), Ilmajoki and Kurikka (Finland), Tartu and Karlova (Estonia) will continue making use of LowTEMP Pilot Energy strategies.

Administrative matters

These include specific good practices, financial implications, challenges as well as synergies and cooperation with other projects and the main drivers of the project (core partners).

- A challenge in the partnership consisted of two project partners dropping out shortly after the project had started. Consequently, the project management had to search and find replacements: Kalundborg Municipality (Denmark) and Halmstad Energy and Environment (HEM), a Swedish district heating provider. These were successfully involved in the project LowTEMP, especially the involvement of HEM proved to be very valuable due to the innovative pilot activity.
- The prolongation, due to Covid-19, was crucial for the project partners to finalise all project activities and outputs successfully.
- Within the framework of the mid-term and the final conferences, intensified cooperation with other projects, initiatives and institutions was initiated. Among these are the H2020 project Cool DH, Halmstad University, HafenCity University, Euroheat & Power.