

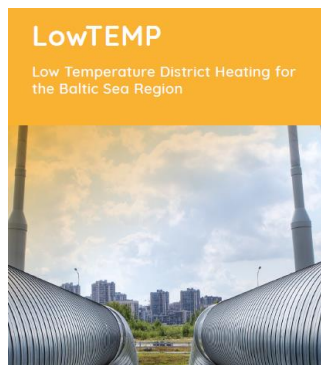
# Training on Low Temperature District Heating in the Baltic Sea Region

LowTEMP 2.0 conference | 18 November 2021

*Jan Gerbitz, ZEBAU GmbH & Britta Schmigotzki, atene KOM*

# Background

# Two connected projects



- **Main stage project**
- 3 years and 3 months project duration  
October 2017 – December 2020
- Project foci:
  - Making the DH supply in the partner countries more sustainable
  - Learn about 4GDH / LTDH
  - Know-how and strategic tools on how to plan, finance, install and manage LTDH



- **Extension stage project**
- 1 year project duration  
January 2021 – December 2021
- Project foci:
  - Adaptation of LowTEMP training material to national conditions
  - Implementation of training seminars
  - Development of e-learning programme

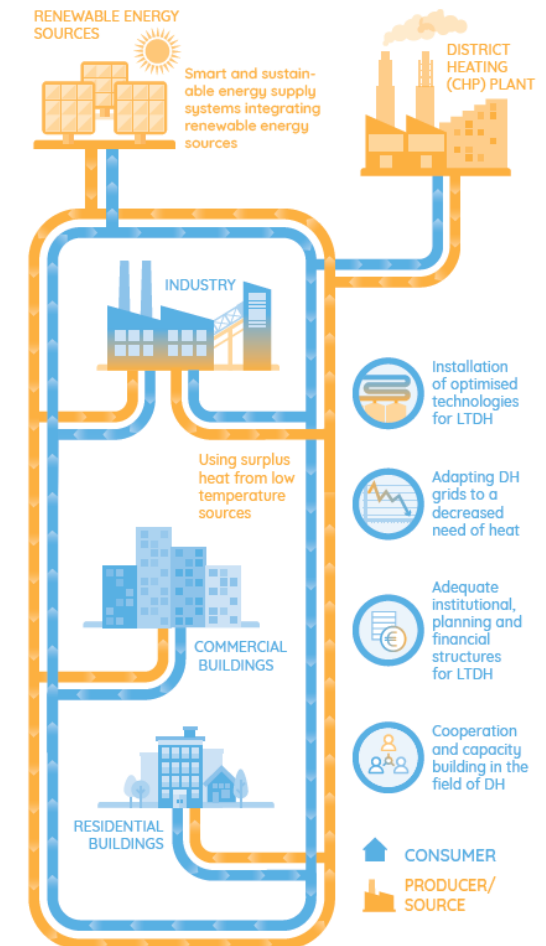
# Capacity building...

... in LowTEMP

# What we were aiming at in LowTEMP

- Collection and provision of information and data on DH and LTDH
- Assessment environmental and economic benefits of LTDH
- Guidelines and strategic approaches on how to plan, finance, install and manage LTDH systems
- Realisation of pilot testing measures
- Increased knowledge on smart DH systems and the installation of LTDH

... to pave the way...

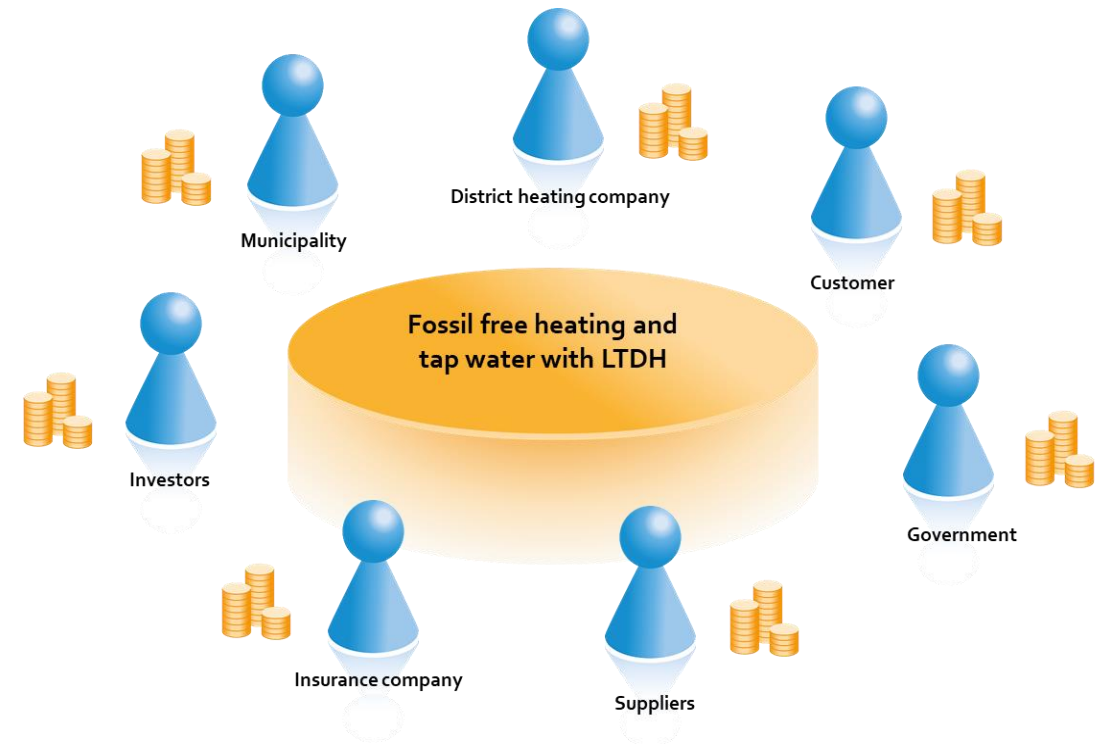


# LowTEMP target groups and stakeholders

Development and implementation of LTDH needs cooperation and involvement of different actors:

- Municipalities to set framework conditions
- Urban energy planners to develop energy strategies
- Technical planners to develop the infrastructure
- District heating companies to do the investments
- Housing companies and property owners to become customers

→ Different need for capacity building



Redrawn from <https://thebridge.se/method/>

# Training Package Low Temperature District Heating

- Teaching material for a two or three-day seminar, individual workshops or political talks
- Depending on the “training form/method” different selections and combinations of material/content can be used

## Each module contains:

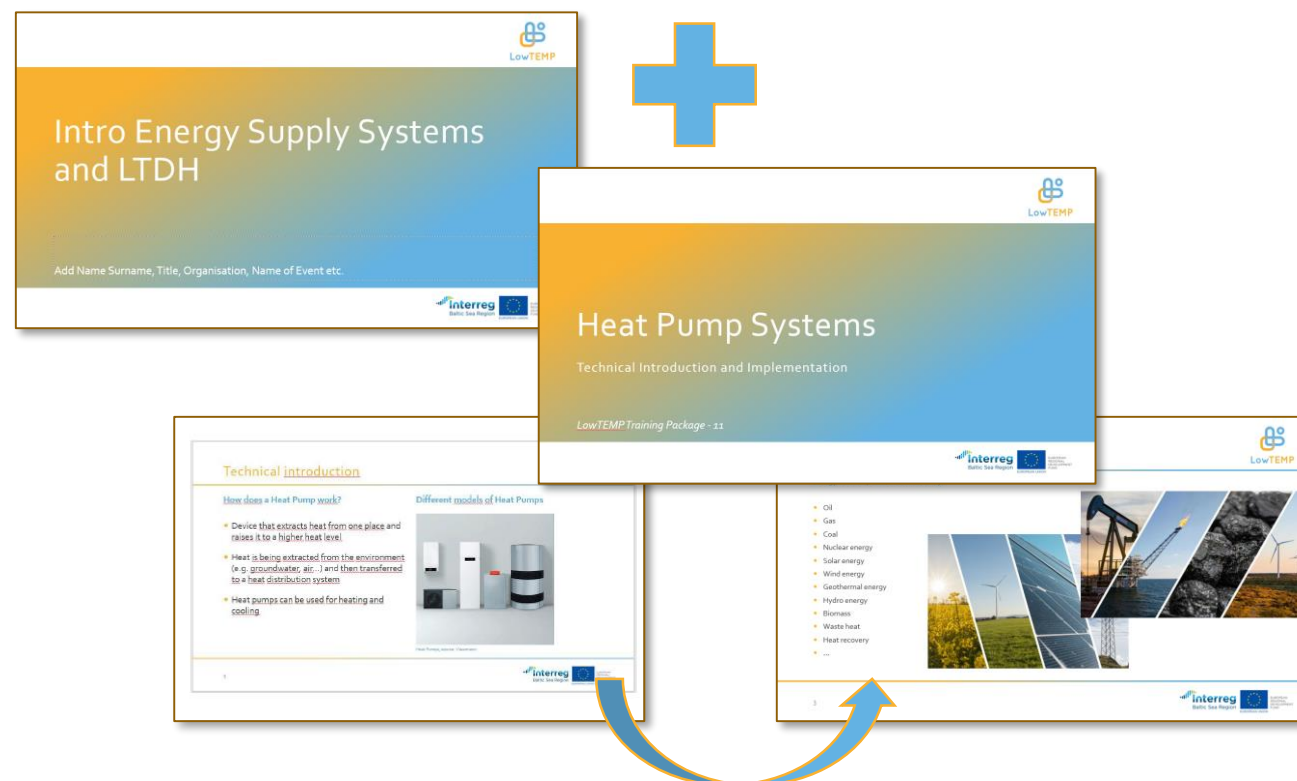
1. Powerpoint Presentation (about 45 minutes)
2. Handout for participants
3. Background info-material for the speaker presenting



# LowTEMP training package

## 26 Modules

- ready to be
  - Shortened
  - Combined
  - Tailored to specific needs





# LowTEMP training package - OVERVIEW

## Introduction

Intro Climate Protection Policy and Goals

Intro Energy Supply Systems and LTDH

Energy Supply Systems in Baltic Sea Region

## Energy Strategies and Pilot Projects

Methodology of Development of Energy Strategies

Pilot Energy Strategies – Aims and Conditions

Pilot Energy Strategy – Examples

Pilot Testing Measures

CO<sub>2</sub> emission calculation

LCA calculation

## Financial Aspects

Life cycle costs of LTDH projects

Economic efficiency and funding gaps

Contracting and payment models

Business models and innovative funding structures

## Technical Aspects

Pipe Systems

Combined heat and power (CHP)

Large Scale Solar Thermal

Waste & Surplus Heat

Large Scale Heat Pumps

Power-2-Heat and Power-2-X

Thermal, Solar Ice and PCM Storages

Heat Pump Systems

LT and Floor heating

Tap water production

Ventilation Systems




## Best Practice

Best Practice I

Best Practice II


# LowTEMP training package - Download

www.lowtemp.eu

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**LowTEMP Training Package**

The LowTEMP training package contains the key know-how, innovative strategies and tools to enable DH stakeholders to realise LTDH. Around 25 seminar modules cover different aspects – from background material to strategies and concepts, from technical aspects to best practice.

In their final versions, each module consists of

- Presentation
- Handout
- Background material




You can download the modules below.

**Introduction**

**Energy Strategies and Pilot Projects**

**Financial Aspects**

**Technical Aspects**

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**Methodology of Development of Energy Strategies**

Explanation of the methodology behind the development of energy strategies involving low temperature district heating.

[Download powerpoint presentation](#)
[Download handout](#)
[Download background information](#)

**Pilot Testing Measures**

Presentation of LowTEMP pilot measures in Gulbene and Halmstad and identification of recommendations and conclusions for further project implementations.

[Download powerpoint presentation](#)

**LCA calculation**

Definition of Life Cycle Thinking and Life Cycle Assessment (LCA) as well as exemplary calculation of Life Cycle Impact of two case study projects.

[Download powerpoint presentation](#)
[Download handout](#)

**Financial Aspects**

**Business models and innovative funding structures**

Definition of the term business model and description of new innovative business model tools as well as innovative funding structures.

[Download powerpoint presentation](#)
[Download handout](#)
[Download background information](#)

# Capacity building...

... in LowTEMP 2.0

# Project partners from nine BSR countries



# Adjustment of LowTEMP training material to national conditions



LowTEMP2.0

## LowTEMP training package - OVERVIEW



Introduction	Financial Aspects	Large Scale Heat Pumps
Intro Climate Protection Policy and Goals	Life cycle costs of LTDH projects	Power-2-Heat and Power-2-X
Intro Energy Supply Systems and LTDH	Economic efficiency and funding gaps	Thermal, Solar Ice and PCM Storages
Energy Supply Systems in Baltic Sea Region	Contracting and payment models	Heat Pump Systems
Energy Strategies and Pilot Projects	Business models and innovative funding structures	LT and Floor heating
Methodology of Development of Energy Strategies	Technical Aspects	Tap water production
Pilot Energy Strategies – Aims and Conditions	Pipe Systems	Ventilation Systems
Pilot Energy Strategy – Examples	Combined heat and power (CHP)	Best Practice
Pilot Testing Measures	Large Scale Solar Thermal	24 Best Practice I
CO2 emissions and LCA calculation	Waste & Surplus Heat	25 Best Practice II

## Избыточное и отработанное тепло

Использование в системах централизованного теплоснабжения

### 1. Введение - Возможности утилизации отработанного тепла

- Утилизация отработанного тепла может повысить энергоэффективность в корпоративном секторе
- За счет рекуперации отработанного тепла могут быть достигнуты целевые показатели сокращения выбросов CO<sub>2</sub>, установленные на 2030 и 2050 годы.
- Экономия первичной энергии
- Но: Избегание, Сокращение, Повторное использование, Утилизация или перемещение отработанного тепла, например, в систему отопления являются этапами на пути к возможному использованию отработанного тепла!
- Отработанное тепло может быть использовано как для замены, так и для дополнения тепла, вырабатываемого обычными методами.
- Тепловые сети особенно подходят для использования отработанного тепла, поскольку они способны комбинировать тепло, получаемое от различных источников тепла.

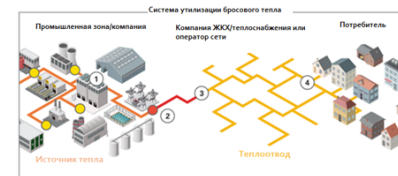


Рис 1: Пример интеграции отработанного тепла в систему централизованного теплоснабжения

## Elekter soojuseks & elekter gaasiks (vesinikuks) kaugküttesüsteemides

Potentsiaal, sektori sidestamine ja oluline komponent soojuse muundamisel

### Jvairūs verslo modeliai ŽTCŠT, palyginus su įprasto centralizuoto šilumos tiekimo verslo modeliais

- Pagrindiniai partneriai – daugiau bendradarbiavimo ir pagrindinės partnerystės
- Pagrindinė veikla – perejimas nuo gamybos prie paslaugų
- Pagrindiniai ištekliai – nauji kompetencijų tipai
- Kaštų struktūra – didesnė kaštų skirtumai
- Vertės pasiūlymai – skirtingi iš skirtingų vartotojų
- Vartotojų segmentai – daugiau ir įvairresni
- Kanalai – įvairūs kanalai bus naudojami įvairiems vartotojų segmentams
- Pajamų šaltiniai – įvairresni, daug mažų



## Pilot Energie Strategien (PES)

Beispiele: Gulbene und Ilmajoki

LowTEMP Training Package – Seminarmodul 06



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Energy Supply Systems in Baltic S

## Energy Strategies and Pilot

Methodology of Development of  
Strategies

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Pilot Energy Strategy – Examples

Pilot Testing Measures

CO2 emission calculation

LCA calculation

## Financial Aspects

Life cycle costs of LTDH projects

Power-2-Heat and Power-2-X

Thermal, Solar Ice and PCM Storages

o Systems

or heating

production

n Systems

ctice

ice I

ice II

**Training material adapted to national regulations and conditions.**

**Translation into the 9 partner languages**



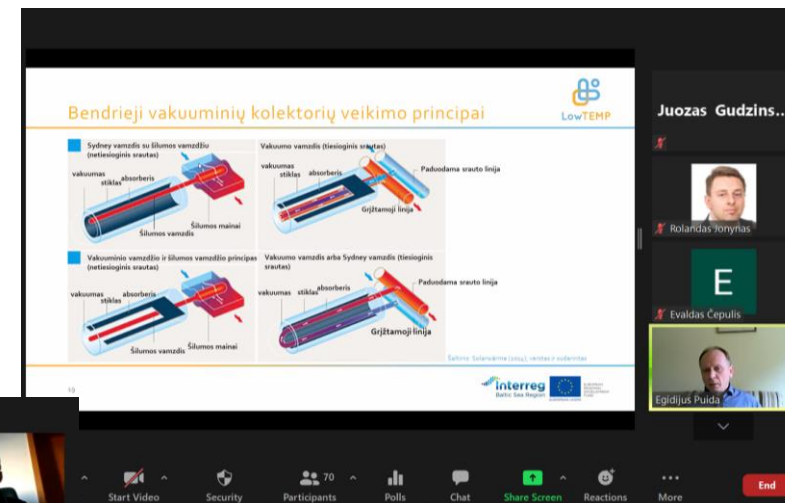
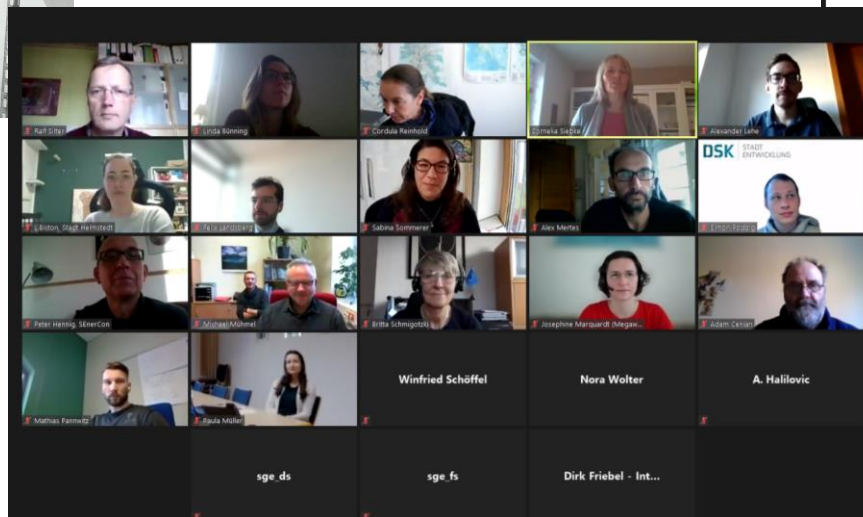


# Training seminars



Study trips

## Workshops



## Lectures

# Training seminars

28 seminars...

Online lectures

Online workshops

Study trips

...in 9 countries



80 hours of LowTEMP



30 speaker



819 participants



1.043 registrations

groups of 9 to 185 persons



# LowTEMP training package - Application examples

- **Political Talk**  
„Climate Protection and Energy Supply“



30 min

Intro Climate Protection Policy and Goals  
Intro Energy Supply Systems and LTDH  
Energy Supply Systems in Baltic Sea Region  
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Pilot Energy Strategy - Examples  
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Waste & Surplus Heat  
Large Scale Heat Pumps  
Power-2-Heat and Power-2-X  
Thermal, Solar Ice and PCM Storages  
Heat Pump Systems  
LT and Floor heating  
Tab water production  
Ventilation Systems  
Best Practice I  
Best Practice II

# LowTEMP training package - Application examples

- **Political Talk**  
„Climate Protection and Energy Supply“
- **Workshop**  
„Energy Strategy for a specific neighbourhood “  
„How to support LTDH“  
„How to financially support LTDH“



30 min



3 hours

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# LowTEMP training package - Application examples

- **Political Talk**  
„Climate Protection and Energy Supply“
- **Workshop**  
„Energy Strategy for a specific neighbourhood “  
„How to support LTDH“  
„How to financially support LTDH“
- **Technical Seminar**  
„Being ready for LTDH“



30 min



3 hours



1 day

Intro Climate Protection Policy and Goals
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# LowTEMP training package - Application examples

- **Political Talk**  
„Climate Protection and Energy Supply“
- **Workshop**  
„Energy Strategy for a specific neighbourhood“  
„How to support LTDH“  
„How to financially support LTDH“
- **Technical Seminar**  
„Being ready for LTDH“
- **Technical Seminar**  
„Urban energy planning“  
„Energy supply projects“



30 min



3 hours



1 day



2 days

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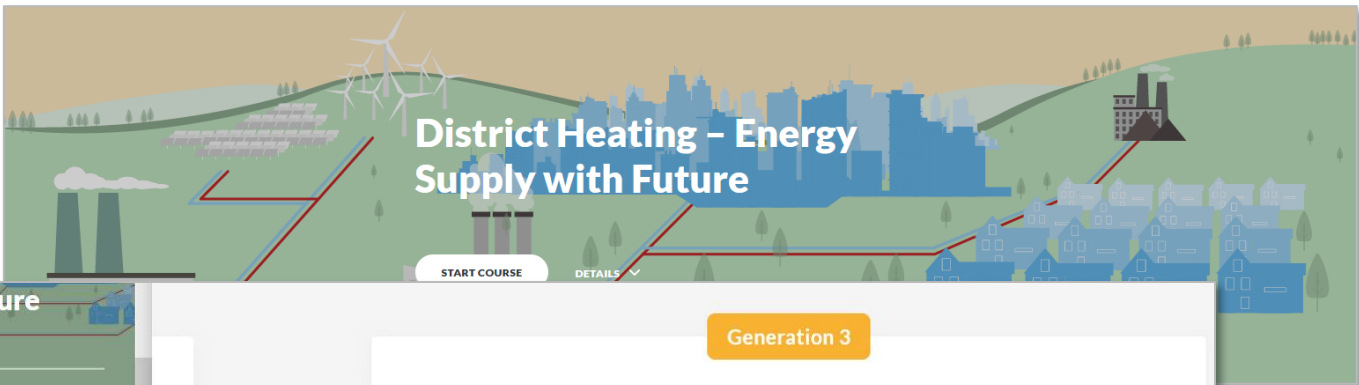
# Development of e-learning courses

- Based on training package of LowTEMP project
- The online training courses support the seminar material developed in LowTEMP 2.0
- Topics covered:
  - District Heating – General information
  - District Heating and EU climate goals
  - Technical aspects of DH
  - Best practice DH/LTDH
- E-learning courses will be available online and free of charge on [www.lowtemp.eu](http://www.lowtemp.eu)
- Excellent learning option for actors that are not able to attend seminars and also Covid-19-compliant alternative to learn about LTDH





# Development of e-learning courses



## District Heating – Energy Supply with Future


START COURSE DETAILS

with Future

33% COMPLETE

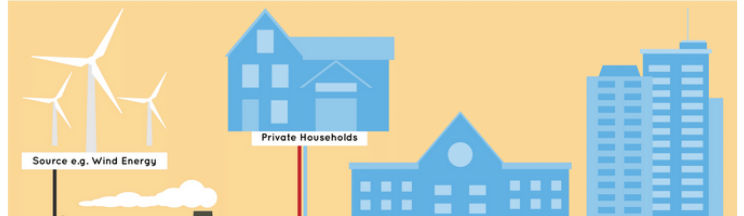
- District Heating – A short overview ☒
- Advantages and Disadvantages of District Heating ☒
- Potential of Low Temperature District Heating ☐
- Evolution of District Heating ☒
- Current state of District Heating in the BSR ☐
- The project LowTEMP ☐
- Summary ☐

Generation 3




The third generation was introduced in the 1970s and strived for more energy efficiency as well as reduced operating and investment costs. To achieve this, prefabricated and pre-insulated steel pipes were directly laid into the ground. The systems and components were characterised by better quality and temperature levels could be reduced, which led to

### The district heating system

SUPPLY AND NETWORK	TEMPERATURE AND PRESSURE	SOURCES
<p>The <b>supply</b> of district heating is as simple as this: The produced heat is transported to the customer via a pipeline system using a transport medium (usually hot water). The heat is transferred to the building via the house transfer station. The cooled water is then returned from the respective building to the network.</p> <p>The <b>pipe network</b> allows the centralised heat sources to be connected to many heat consumers. DH often is installed in residential quarters, industrial and educational complexes, as it avoids the need to produce heat individually. However, the distribution network can also only supply a few consumers. In the latter case, one speaks of local heating supply.</p> 		

### 2. Space saving, no

As the individual properties are necessary. This is further. Furthermore, no maintenance necessary maintenance service saves time and money.



# We Continue Building DH Capacity...

... and we would like you to cooperate with us!

- Please visit our website for news and project results:  
[www.lowtemp.eu](http://www.lowtemp.eu)
- Follow us:  
@LowTEMPdh 
- Join our network
- Let's exchange on LTDH and smart DH grids



## LowTEMP 2.0:

- Get familiar with our training material
- Feedback is welcome
- Take part in training seminars
- Promote our training material and the e-learning courses

# Contact

## ZEBAU GmbH

Zentrum für Energie, Bauen, Architektur und Umwelt

**Jan Gerbitz**  
Project Manager

Große Elbstraße 146  
22767 Hamburg  
Germany

E-mail: [info@zebau.de](mailto:info@zebau.de)  
Tel: +49 40 - 380 384 - 0  
[www.zebau.de](http://www.zebau.de)



## atene KOM

Agency for Communication, Organisation and Management

**Britta Schmigotzki**  
Project Manager

Invalidenstraße 91  
10115 Berlin  
Germany

E-mail: [b.schmigotzki@atenekom.eu](mailto:b.schmigotzki@atenekom.eu)  
Tel: +49 30 22183-3101  
[www.atenekom.eu](http://www.atenekom.eu)  
[www.lowtemp.eu](http://www.lowtemp.eu)

