



# EUROHEAT & POWER

*Application of renewable sources in district heating*

Paul Voss/ Euroheat & Power  
Renewable Energy Sources in District Heating and  
Cooling Systems, 5-6<sup>th</sup> December 2019  
Belgrade, Serbia



# What do you see?



**RESEARCH  
AND  
INNOVATION**

**KNOWLEDGE  
AND  
VISIBILITY**

Picture: D. Ruta





# EUROHEAT & POWER

One day, one building, one city at a time.

Vision 2050



## Upgrading the performance of district heating networks

Best practice examples on upgrading  
projects



### Best practice examples of upgrading DH:

- Integration of thermal storage
- Optimisation of pumping operations
- Biomass fired boiler house
- Renovation of the DH system
- Replacement of fossil fuels
- Integration of solar thermal
- ...and more



*This project has received funding from the European Union's Horizon 2020  
research and innovation programme under grant agreement No 785014*

# RENOVATION OF THE DH SYSTEM IN AKMENĖ, LITHUANIA (2000 – 2016)



Figure 14 Before the upgrading process

Akmenės energija has implemented several renovation measures in the district heating system:

- inefficient boiler houses → modern and efficient gas boilers
- increase the share of biomass in the fuel mix
- change the pipelines with new insulated pipelines
- modern metering solutions for the users
- education measures for the community → promote the idea of **sustainable development**

This led to a remarkable increase in the DH **energy efficiency**, such as a decrease of technical losses in DH networks, water, electricity and fuel consumption for the generation and supply of heat.



Figure 15 After the upgrading process



Figure 16 Old exposed pipelines



Figure 17 New cased underground pipelines

# GREEN ENERGY PARK LIVNO, BOSNIA AND HERZEGOVINA (2012 – 2016)



Figure 18 Before the upgrading process

DH based on fuel oil

The project increases the use of **renewable energy sources**, specifically for heating public buildings, business buildings and individual houses, as well as renewable electricity production. Retrofitting measures include:

- reconstruction of 2,600 m of pipe network
- upgrading of the boiler room
- installation of additional biomass boilers
- extension of the piping network
- installation of photovoltaic panels (844 m<sup>2</sup>/79 kWp)



Figure 19 After the upgrading process

The Project's Cashflow presents an Economic Benefit after Year Seven



Figure 20 Expected project's cashflow in eleven years, based on: [www.unecce.org](http://www.unecce.org)

## THE FUTURE IS SOLAR?

**15 MW** SDH plant inaugurated in Latvia

**21,672 m<sup>2</sup>** solar field and a wood chip boiler

Meets **90 %** of demand from the local heat network

Could reduce the company's district heat tariff  
by **at least 5 %**



Photo: Salaspils Siltums

## INTEGRATION OF SOLAR THERMAL...IN RUSSIA'S FAR EAST

Government-owned heat utility  
Primteploenergo has started up its **first solar thermal system**

It is made up of **18 vacuum tube collectors**, which supply hot water and space heating to a kindergarten on Russky Island in the Andaman Sea, west of Japan.



Photo: image taken from a video at <https://vestiprim.ru/>

The payback period is just **five years**



**Primorje Region in the far east of Russia**  
Source: Wikipedia



# MISKOLC GEOTHERMAL DISTRICT HEATING PROJECT, HUNGARY (2009 – 2014)

the largest Hungarian **geothermal** district heating project

the largest **geothermal** heating plant of Central Europe

**natural gas** was the key energy source for the DH system

the main energy sources now are

**geothermal energy, biomass and solar energy**



Reduction of CO2 emission – **800–950 TJ/year**

Societal impact - a new renewable energy

operating company with **dozens of employees:**

Miskolc Geothermal Ltd.



# GYŐR GEOTHERMAL DISTRICT HEATING PROJECT, HUNGARY (2013 – 2015)

natural gas was the key energy source for the DH system

the main energy sources now are  
geothermal energy and solar energy

Redeemed natural gas – 52 MW heat capacity

Reduction of CO2 emission – 800–900 TJ/year

Societal impact - a new renewable energy  
operating company with dozens of employees:  
Arrabona Geothermal Ltd.



Images: [www.pannergy.com](http://www.pannergy.com)

# IMPROVING THE PERFORMANCE OF DISTRICT HEATING SYSTEMS IN CENTRAL AND EASTERN EUROPE



Renewing district heating



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

Launched a **Learning Centre**

designed to support **district heating operators**, when deciding to improve their existing district heating system



# EXAMPLE OF PROJECT SUPPORT: CROATIA

## Novosti



4 April 2019

### Data intelligent operation of district heating and district cooling systems

KeepWarm project partner University of Zagreb (Faculty of Mechanical Engineering), together with the Centre for IT-Intelligent Energy Systems (CITIES) project and the City of Zagreb, organised a joint workshop on "Data intelligent operation of..."

[Read more](#)



5 December 2018

### Croatia towards improving the performance of DHS

As its combination of concrete work with pilot district heating systems and its close cooperation with national and European multipliers to disseminate this experience broadly are unique features of the KeepWarm project, we would like to start...

[Read more](#)



11 April 2018

### KeepWarm Kick-off meeting took place in Zagreb

In many countries in Central and Eastern Europe District Heating Systems (DHS) are often inefficient and for the most part still overly reliant on fossil fuels (oil, gas or coal). The EU Horizon 2020 project KeepWarm aims at modernising DHS around...

[Read more](#)

# EXAMPLE OF PROJECT SUPPORT: UKRAINE

## Новини



25 April 2019

**У рамках проекту KeepWarm відбулося навчання з фінансових та організаційно-управлінських питань для теплопостачальних підприємств**

23-25 квітня у м. Київ відбулися четвертий та п'ятий навчальні семінари для представників теплокомуненерго в рамках проекту...

[Read more](#)



13 March 2019

**Учасники проекту KeepWarm познайомилися із досвідом використання біомаси в системі теплопостачання у Кам'янці-Подільському**

12-14 березня у м. Кам'янець-Подільський відбувся третій навчальний семінар для представників теплокомуненерго в рамках проекту KeepWarm....

[Read more](#)



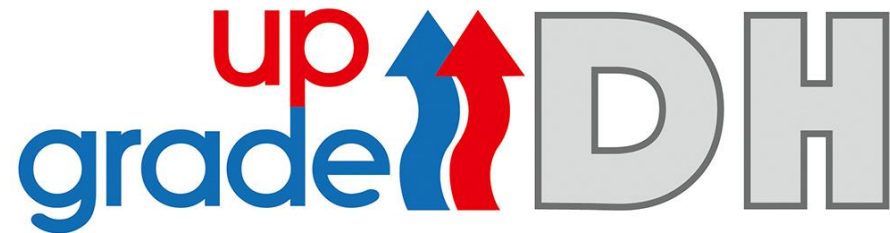
25 January 2019

**У Житомирі відбувся другий навчальний семінар у рамках проекту KeepWarm**

22-24 січня у м. Житомир відбувся другий навчальний семінар для представників теплокомуненерго в рамках проекту "Покращення..."

[Read more](#)

# UPGRADING THE PERFORMANCE OF DISTRICT HEATING NETWORKS IN EUROPE



*This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 785014*

## opportunities for the energy efficient upgrading of district heating systems

The handbook is aimed at **decision makers**, **utilities** and **system operators**, and is available in English, Danish, Italian, Lithuanian, Polish, Croatian and Bosnian.



### Upgrading the performance of district heating networks


**Technical and non-technical approaches**

*A Handbook*



Three horizontal bars in dark blue, light green, and orange colors are positioned at the top center of the slide.

# MAKING IT HAPPEN: KEYS TO SUCCESS

- Strategic national vision for heating and cooling
  - Empower your cities
  - Focus on investing to stop spending
  - Internalise external costs (pollution, supply disruption, CO<sub>2</sub>)
  - Look beyond the building
  - Look beyond your network – system integration makes things easier
  - Ask for help
  - Take pride in what you have! It's more precious than you think.
- 
- Three horizontal bars in dark blue, light green, and orange colors are positioned at the bottom of the slide.



**EUROHEAT  
& POWER**

THANK YOU - Questions?

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Head over to [www.euroheat.org](http://www.euroheat.org)  
[www.upgrade-dh.eu](http://www.upgrade-dh.eu)  
[www.solarthermalworld.org](http://www.solarthermalworld.org)  
[www.pannergy.com](http://www.pannergy.com)  
[www.keepwarmeurope.eu](http://www.keepwarmeurope.eu)  
and find out more.