



EUROHEAT & POWER

Application of renewable sources in district heating

Paul Voss/ Euroheat & Power
Renewable Energy Sources in District Heating and
Cooling Systems, 5-6th 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



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 m²/79 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

THE FUTURE IS SOLAR?

15 MW SDH plant inaugurated in Latvia

21,672 m² 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/>



Primorje Region in the far east of Russia
Source: Wikipedia

The payback period is just **five years**

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.



Images: www.pannergy.com

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

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



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](#)



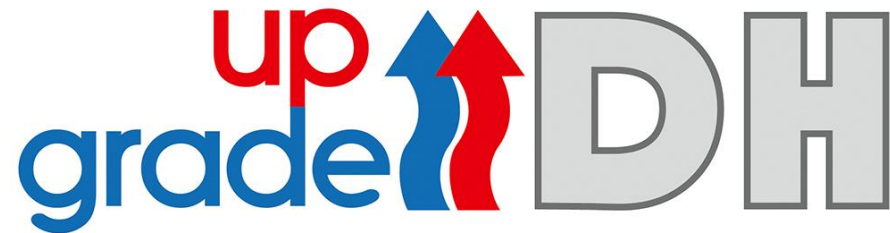
25 January 2019

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





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, CO₂)
 - 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.
- 



**EUROHEAT
& POWER**

THANK YOU - Questions?

Head over to www.euroheat.org
www.upgrade-dh.eu
www.solarthermalworld.org
www.pannergy.com
www.keepwarmeurope.eu
and find out more.