



Improving the performance of District Heating Systems in Central and Eastern Europe

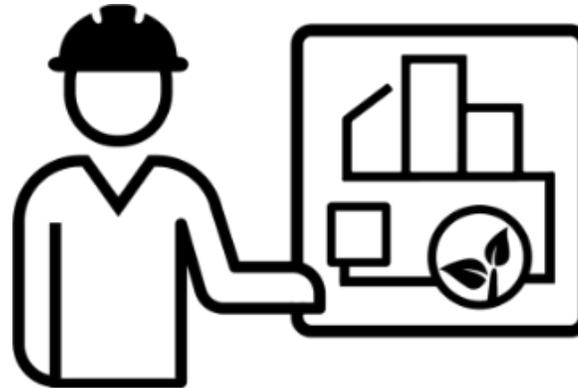


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This project receives co-funding from the German Federal Ministry of Economic Cooperation and Development.



Keeping our cities renewably warm



8. October 2020 e-seminar
George Stiff, ICLEI Europe

ABOUT KEEPWARM

KeepWarm supports **forward-looking district heating systems** (DHS) in seven countries of Central and Eastern Europe (CEE) to develop and implement pilot projects which **retrofit** their systems in a more **sustainable** manner.

To **overcome barriers** to DH deployment across the region, KeepWarm facilitates DHSs via a multi-stage approach:



Increased capacities of specialists working in DHS companies by offering training workshops

DHSs supported in the development of viable business plans



DHSs advised on how to mobilise funding for bankable pilot projects

Exhibit of replicable DHS demo cases



Facilitating the multi-level integration of DHS retrofits into key strategies and plans



International project partners

ASSOCIATION FOR DISTRICT HEATING
of the Czech Republic

Czech Republic



Latvia



Austria



Ukraine

Jožef Stefan Institute, Ljubljana, Slovenia
Energy Efficiency Centre



Slovenia

Serbia

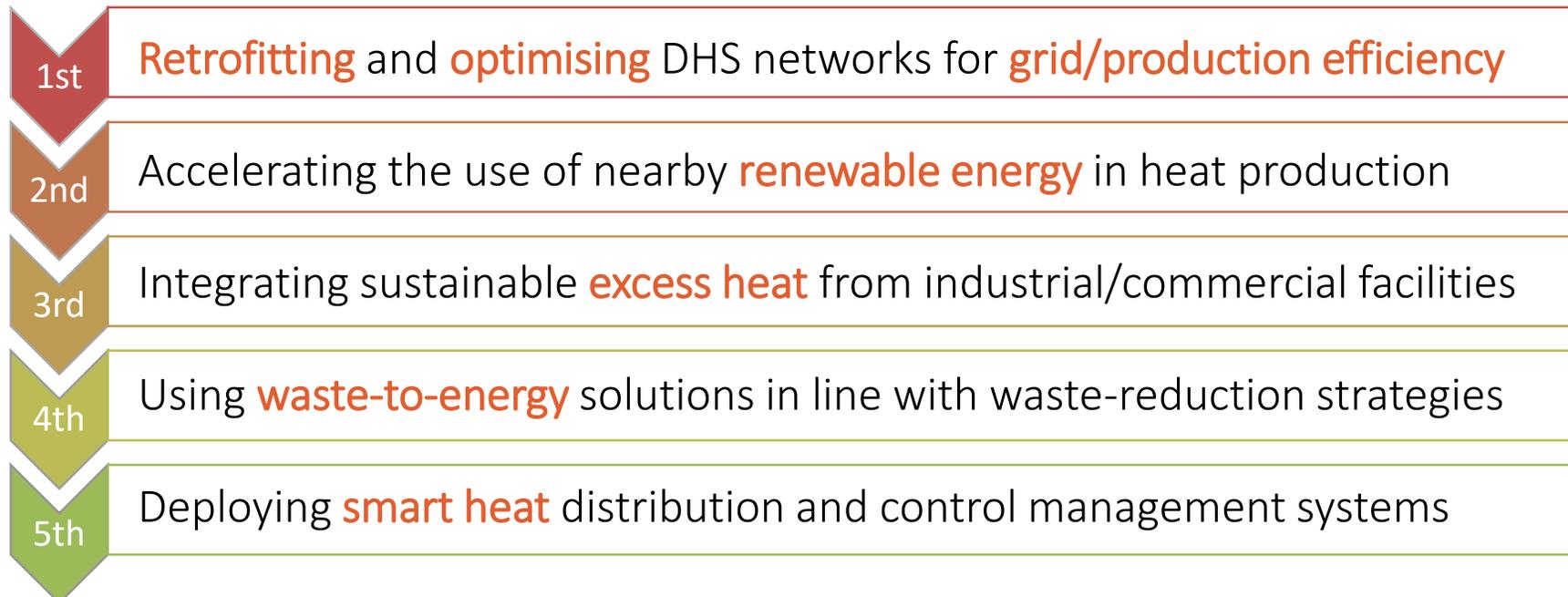


Croatia



KEEPWARM RETROFITS

KeepWarm partners and DHSs are essentially following a suggested action-hierarchy to achieve more **efficient operations** from **cost-effective investments**, which provide even more **reliable services** to DH customers while still contributing greatly to **climate-related goals**.



KEEPWARM SHOWROOM OF DHS PILOTS

KeepWarm's Showroom of replicable and bankable DHS pilot projects highlights key details for the project's DH pilots, each from an **operational and planning perspective**.

- Portfolio of **23 DHS** pilots
 - Operations
 - Investment plans and drivers
 - Key stakeholders
 - Resource requirements
 - Results...
- Trends and **national contexts**
 - Challenges and trends
 - Policy/investment framework
 - Recommended actions...
- All 7 **translated** versions now on our country pages

DHS Ptuj

Switch to biomass and optimisation of boiler and grid



Source: Javne službe Ptuj, d.o.o.

Investment plans:
Optimisation of the biomass boiler and boiler house installation within next two years. In second phase is also planned to increase the grid and optimise it.

Primary work-steps and investment drivers:

- Company (internal) development plan Municipal Local energy concept (LEK)
- Available incentives – Ministry of Infrastructure Co-financing of renewables for DHSs

Strategic background documents:

- NATIONAL ENERGY EFFICIENCY ACTION PLAN 2014–2020

Stakeholder involvement:

- Leading: Local decision makers, biomass suppliers
- Other: Customers, Technology suppliers

Required resources:

Financial investment: 1.538.824,88 EUR + 525.500 EUR
Additional staff: none – outsource
Other: outsourcing of services for documentation, design, etc.

Results:

- RES-share increase: before 0 % ⇒ after 80 %
- RES/fossil heat production ratio: 5/1
- Grid efficiency: increase of 3 %
- New connections: 2.500 MWh/Year
- Emissions: 1.515 tCO₂
- Payback period: 8-10 years

Want to adapt our work to your DHS? Want to invest in our progressive DHS? Contact us using the information below!

Franci Voglar / Project manager
Franci.Voglar@jzp.si

CTS u RH

Legislativni okvir i mjere



Source: [MWR/KOIS](#)

ENERGETSKA BILANCA U CTS U RH

Elektra lako lošivo ulje: 7,46%

Plinski plin: 86,79%

Daljinsko grijanje pokriva 15% ukupnog toplinskog konzuma u Hrvatskoj s različitim veličinama i vrstama CTS. Oko 110 CTS regulirano je putem Hrvatske regulatorne energetske agencije (HERA). Većina sustava u vlasništvu je javnih kompanija.

Izazovi

- Distributivna mreža je zastarjela i **neučinkovita**
- CTS zahtjevaju značajne investicije u **obnovu** i modernizaciju
- Nedostatak **energetskog planiranja** koje bi omogućilo suradnju
- Nedostatak **legislativnog okvira** za dekarbonizaciju

Trendovi

- **Kogeneracijska postrojenja** ostaju jezgra CTS-a u RH
- Potrošnja topline se **smanjuje** uslijed povećanja energetske učinkovitosti (obnova zgrada i mreže)
- Postupna integracija **OIE**
- Povećanje energetske učinkovitosti u proizvodnji i distribuciji topline

Zakonodavni okvir

- Cilj: **1% povećanje OIE** u CTS u razdoblju 2021-2025
- Mjere za povećanje **učinkovitosti u CTS**
- Potpora **visokoučinkovitoj kogeneraciji i OIE**

Investment subsidies covering:

Novi CTS / proširenje CTS	<input checked="" type="checkbox"/>
Obnova CTS (EnU / OIE)	<input checked="" type="checkbox"/>
Potrošači / broj priključaka	<input checked="" type="checkbox"/>
Kreditiranje i drugi oblici financiranja	<input checked="" type="checkbox"/>
Porezne inicijative	<input type="checkbox"/>

Preporučene mjere

- Integracija **solarne energije** u CTS
- Analiza potencijala **otpadne topline, solarne i geotermalne energije**
- **Povezivanje individualnih kotlovnica** (manji CTS) u jednu distribucijsku mrežu
- Revitalizacija distribucijske mreže

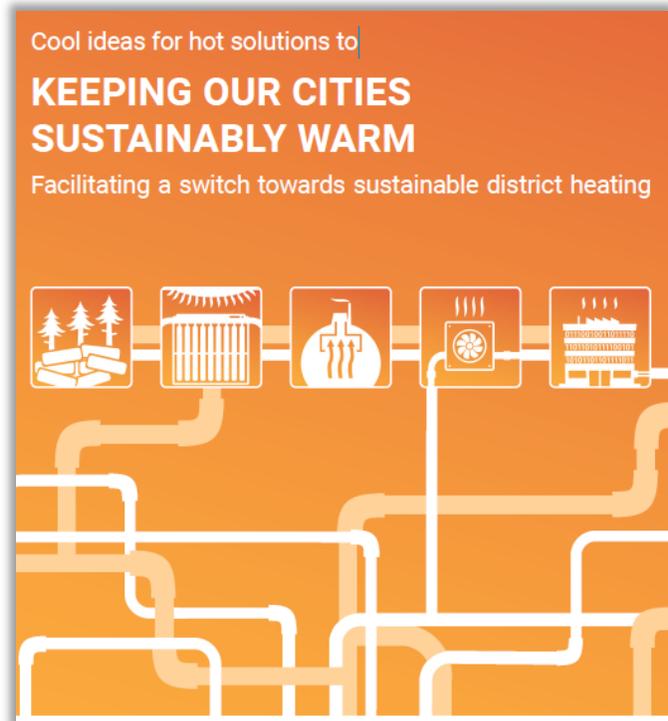
Internet: <https://keepwarm.eu/countries/hr>
local@keepwarm.eu

Internet: <https://keepwarm.eu/countries/hr/countries/hr.html>

GUIDANCE ON DH FUELED BY SUSTAINABLE ENERGY

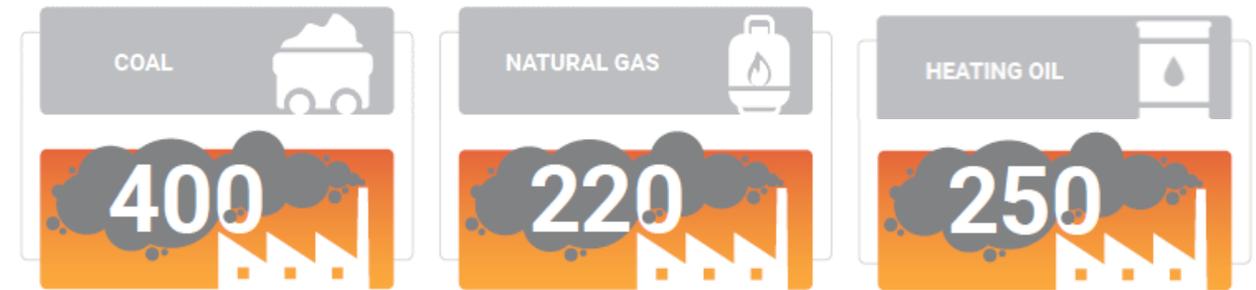
KeepWarm has more recently produced a comprehensive booklet “Keeping our cities sustainably warm” to guide **sustainably-sourced DH** (RE and excess heat)

- Inspire DH companies with **technical and financial indicators**
- Emphasise **funding trends** to European investors/institutions
- Showcase **environmental and socio-economic advantages** of RE and excess heat for policy-makers and public authorities
- Point out **emerging (business) roles** for other companies/stakeholders



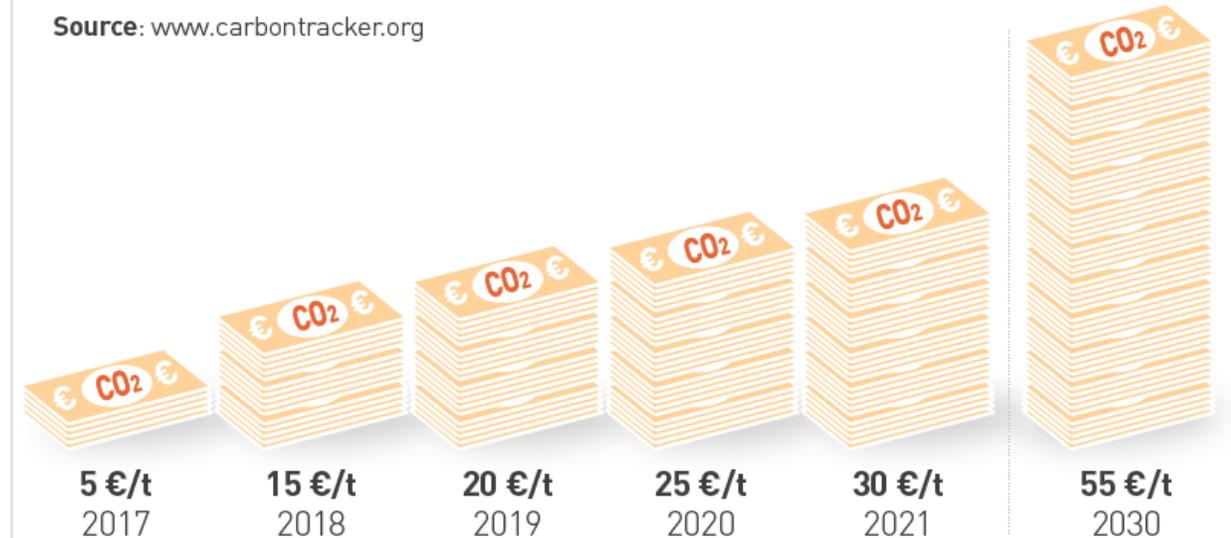
WHY DECARBONISE DISTRICT HEATING?

- **Socio-economic** benefits:
 - GHG emissions
 - Local/regional employment
 - Boost to circular economy and innovation
- It just makes **business sense!**
 - Reasonable payback and O&M costs
 - Low- or no-cost resources
 - Rising fossil fuel prices
 - Public and private investment favoring RE/ExH more and more

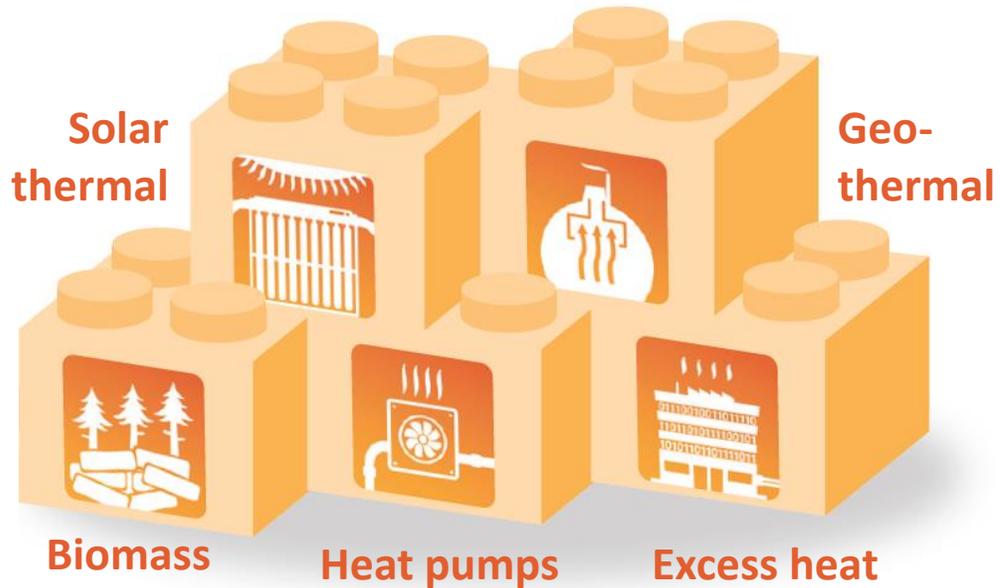


EU carbon allowance price acceleration

Source: www.carbontracker.org



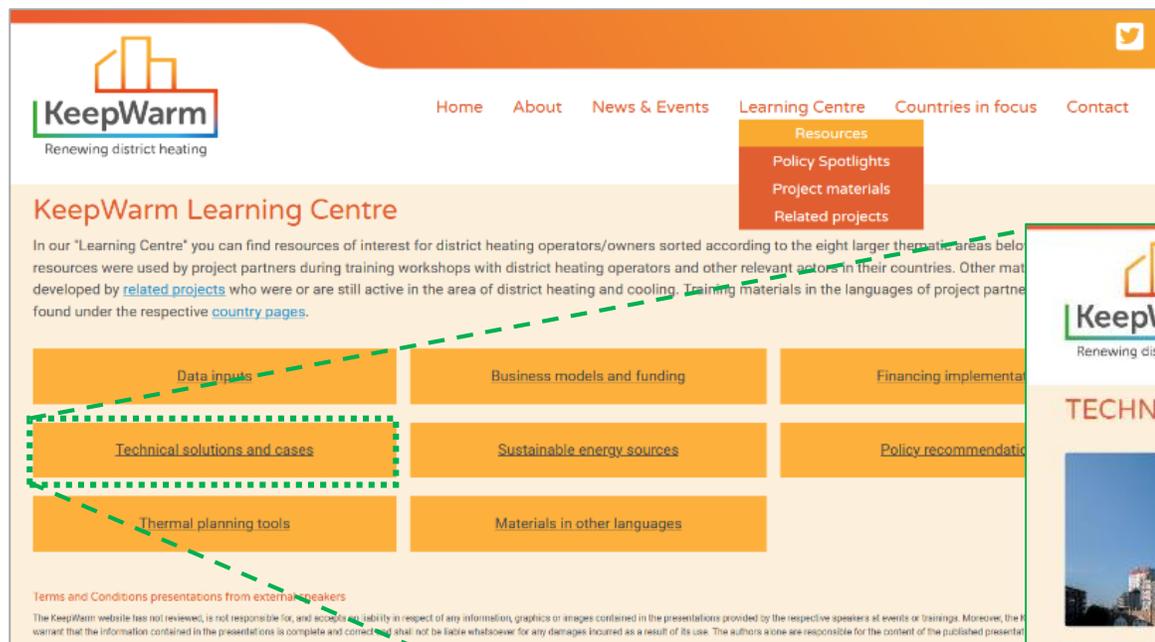
HOW DO SUSTAINABLE ENERGY SOURCES STACK UP?



 <p>Technical characteristics:</p> <ul style="list-style-type: none"> • Plant capacities: 1-50 MW, 65-95% thermal efficiency • Supply temperature: 80-140°C • Resource needs: 270 kg/MWh pellets or 380 kg/MWh chips, assuming 75% DHS efficiency • Technical prerequisites: Fuel storage space (roughly double or more than for coal); Rebuilt plant from fossil fuel to accommodate biomass • DHS suitability: best with modern (prefabricated) or low-temp DHS, not really suitable for steam or older hot-water DH • Operations: up to 100% biomass share of DH can be very effective, but also works well in combination with any other sustainable energy source, usually to supply the base-load 	 <p>Stakeholder engagement:</p> <p>Beyond the general stakeholders and their roles mentioned near the end of this document, and providers of needed technologies, biomass requires special involvement with:</p> <ul style="list-style-type: none"> • Local/regional/national public authorities - should ensure suitable infrastructure network (e.g. forest roads) is in place and provide oversight on the sustainability of forestry/agriculture practices, as well as ensure compliance with air emission standards and pollution limits • Pellet/chip suppliers - key partner guarantee fuel supply and quality • Forestry/agriculture experts - used for understanding fuel availability and sustainability
 <p>Financial data:</p> <ul style="list-style-type: none"> • Upfront costs: 0.3-0.7 M€/MW • O&M costs: 1.8-3% of investment • Payback period: 3-13 years • Jobs: 0.78-2.84/MW 	 <p>Greenhouse gas emissions: 0 kg/MWh</p> <p>Even if including the transport of biomass fuel as well, though this usually counts as transport instead energy generation, the entire biomass cycle still only releases 30 kg/MWh.</p>
	 <p>Financial data:</p> <ul style="list-style-type: none"> • Upfront costs: 0.7-1.9 M€/MW, most of which is usually for drilling costs and completion of wells • O&M costs: 2.5% of investment • Payback period: 5-10 years • Jobs: 1.7MW
 <p>Technical characteristics:</p> <ul style="list-style-type: none"> • Plant capacities: 1-50 MW • Supply temperature: around 80-100°C • Resource needs: >50°C enthalpy at 1-3 km deep, ideally >90 mW/m² heat-flow density • Technical prerequisites: for DH purposes, only moderate drilling depths should suffice • DH suitability: best with modern (prefabricated) or low-temp DH, not as much for older hot-water DH, and not really suitable for steam DH • Operations: works well in combination with any other sustainable energy source to supply the base-load 	 <p>Stakeholder engagement:</p> <p>Beyond the general stakeholders and their roles mentioned near the end of this document, and providers of needed technologies, geothermal requires special involvement with:</p> <ul style="list-style-type: none"> • Local/regional/national public authorities - necessary for issuing drilling permits and facilitating land-rights issues • Land owners/developers - key for making (private) land available for geothermal exploitation • Geology/drilling experts - for ensuring ideal geothermal conditions (e.g. rock types, thermo-clines, water flow...)
 <p>Financial data:</p> <ul style="list-style-type: none"> • Upfront costs: 0.7-1.9 M€/MW, most of which is usually for drilling costs and completion of wells • O&M costs: 2.5% of investment • Payback period: 5-10 years • Jobs: 1.7MW 	 <p>Greenhouse gas emissions: 0-10 kg/MWh</p> <p>The upper value takes into account the entire geothermal process, but otherwise geothermal frequently is just considered to be emission-free.</p>

ACCESSIBILITY OF THE KEEPWARM SHOWROOM

In KeepWarm's **Learning Centre** > Resources > Technical solutions and cases



KeepWarm Learning Centre

In our "Learning Centre" you can find resources of interest for district heating operators/owners sorted according to the eight larger thematic areas below. Resources were used by project partners during training workshops with district heating operators and other relevant actors in their countries. Other materials developed by [related projects](#) who were or are still active in the area of district heating and cooling. Training materials in the languages of project partners are found under the respective [country pages](#).

Data inputs	Business models and funding	Financing implementation
Technical solutions and cases	Sustainable energy sources	Policy recommendations
Thermal planning tools	Materials in other languages	

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TECHNICAL SOLUTIONS AND CASES

The resources listed here are covering various district heating concepts and technologies.

KeepWarm **Showroom of replicable and bankable pilot projects**

The purpose of this Service Pitch Book is to roll out the results of the pilot projects, providing information about national contexts, and pilot DHSs which have been actively participating in the network, providing networking opportunities to reach out to them.



CSA Latvijā

CSA tiek nodrošināta 80% Latvijas ēkām, galvenokārt mājaimniecībām. Pārsvarā CSA uzņēmumi pieder pašvaldībām, ir arī privātie īpašnieki. Trešdaļa no kopējiem Latvijas siltumtīkliem atrodas galvaspilsētā Rīgā.

Izaicinājumi

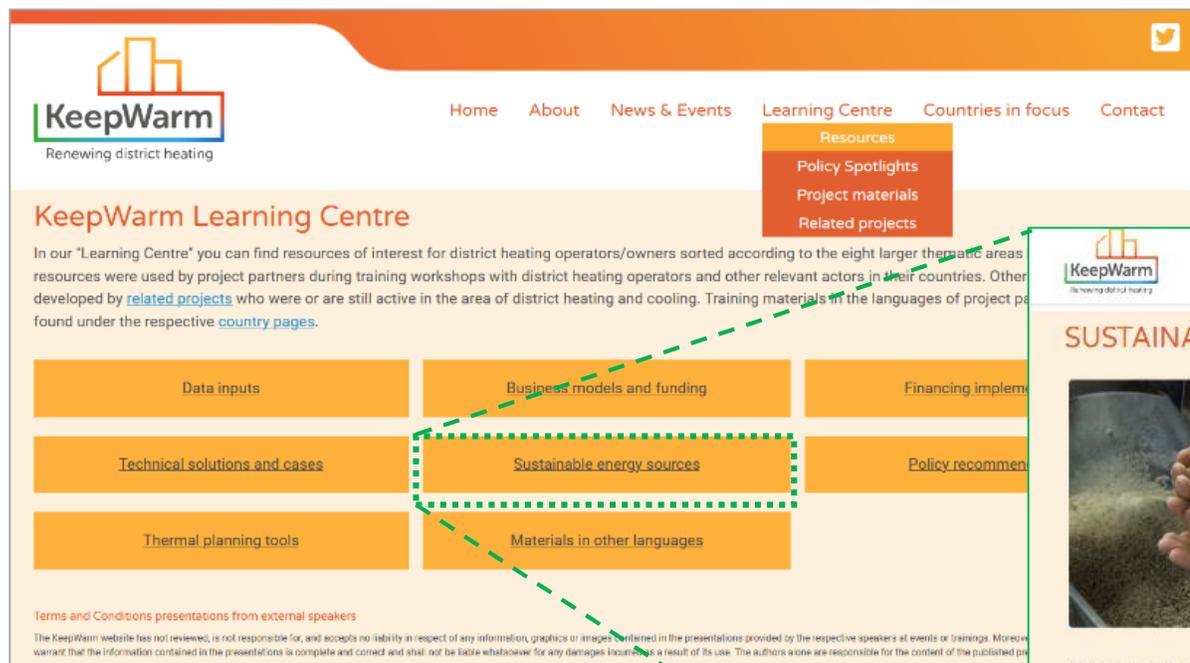
- Siltumtīklos joprojām ir lieli zudumi, līdz pat 16%.
- Patērētāju iesaiste un CSA pievilcīguma palielināšana
- Veco CSAS uzlabošana, siltumtīklu atjaunošana
- Neefektīva un nepietiekama AER izmantošana CSA
- Neesošas centralizētās aukstumapgādes sistēmas

SILTUMENERGIJAS AVOTI – LATVIJĀ

Atjaunojami avoti	13%
Atoma enerģija	53%
Ķīmiskie avoti	34%

ACCESSIBILITY OF THE KEEPWARM GUIDANCE BOOKLET

In KeepWarm's **Learning Centre** > Resources > Sustainable energy sources



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Sustainable Energy Sources

The resources available below and sorted by sub-themes, provide further knowledge on individual sustainable energy sources.

KEEPING OUR CITIES SUSTAINABLY WARM
Facilitating a switch towards sustainable district heating

[KeepWarm Guidance Document](#)

This guidance document has been created as a means of helping you navigate your district heating (DH) by using more sustainable energy sources, namely biomass and/or excess heat harvestable from industrial/commercial processes. A greener DH alternatives makes sense not only at an operational level, but is also a successful implementation of a variety of Europe's flagship policy initiatives.

This Guidance Document is currently being translated into the languages of 10 countries.

Kul ideje za atraktivna rešenja
KAKO OBEZBEDITI DA U NAŠIM GRADOVIMA BUDE TOPLO NA ODRŽIV NAČIN
Olakšavanje prelaska na održivo daljinsko grejanje



KEEP ON LEARNING WITH KEEPWARM

In order to help you on your way, you are highly recommended to explore further the KeepWarm website, including its Learning Centre with numerous resources from KeepWarm and many other related projects and EU-led initiatives, not to mention our latest news.

In particular, you can discover numerous **guidebooks, tools and other useful materials** to help you on your way to modernising DHSs:

- case studies of DH retrofits and sustainable-energy upgrades
- spatial mapping about heat supply and demand across Europe
- free-to use thermal planning software
- policy recommendations
- insights into finance and technical assistance
- training materials in multiple languages – ask us about **trainings we can offer you!**
- (online) Inspire Events, including **final e-conference on 12. Nov...**

... and much more!

KEEP DH GOING WITH KEEPWARM

Finally, it is worth highlighting that the KeepWarm consortium is especially well-suited to use its **competence to help you achieve your DH goals!** Our diverse group of experts can apply our great **experience all across Europe**, especially in countries of the CEE region.

Contact us (centrally or via links on the next pages) so we can know how **our expertise can benefit your work towards making your DH more efficient and sustainable:**

- Technical consultancy
 - Feasibility studies
 - Financial guidance
 - Strategic action-planning
 - Policy/market integration
 - Staff/stakeholder trainings
 - General advice
- ... and much more!



**KEEP CALM
&
KEEP WARM
with
DISTRICT
HEATING**

Thank you! Questions?

For **more information**, and to discover how **we can facilitate you in your DH transition**:

visit our website:

www.KeepWarmEurope.eu

contact us at:

info@keepwarmeurope.eu

follow us on Twitter:

[@KeepWarm_EU](https://twitter.com/KeepWarm_EU)



**ASSOCIATION FOR DISTRICT HEATING
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