KeepWarm

Renewing district heating

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

This project is funded by the EU's Horizon 2020 research and innovation programme under grant agreement N°784966.

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

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Keeping our cities renewably warm

8. October 2020 e-seminar

George Stiff, ICLEI Europe

ICLEI
Local Governments for Sustainability

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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

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International project partners

ICLEI Local Governments for Sustainability (Germany)

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

ASSOCIATION FOR DISTRICT HEATING of the Czech Republic

Czech Republic

Latvia

ZREA ZEMGALES REGIONĀLĀ ENERGĒTIKAS AĢENTŪRA

lk Landwirtschaftskammer Steiermark

Austria

KT-ENERGY

Ukraine

Jožef Stefan Institute, Ljubljana, Slovenia
Energy Efficiency Centre

Slovenia

KSSENA

REGEA REGIONALNA ENERGETSKA AGENCIJA NORTH-WEST CROATIA
SJEVEROZAPADNE HRVATSKE
REGIONAL ENERGY AGENCY

Croatia

VINČA INSTITUTE OF NUCLEAR SCIENCES University of Belgrade
NATIONAL INSTITUTE OF THE REPUBLIC OF SERBIA

FSB University of Zagreb Faculty of Mechanical Engineering and Naval Architecture

Serbia

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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**.

1st Retrofitting and optimising DHS networks for grid/production efficiency

2nd Accelerating the use of nearby renewable energy in heat production

3rd Integrating sustainable excess heat from industrial/commercial facilities

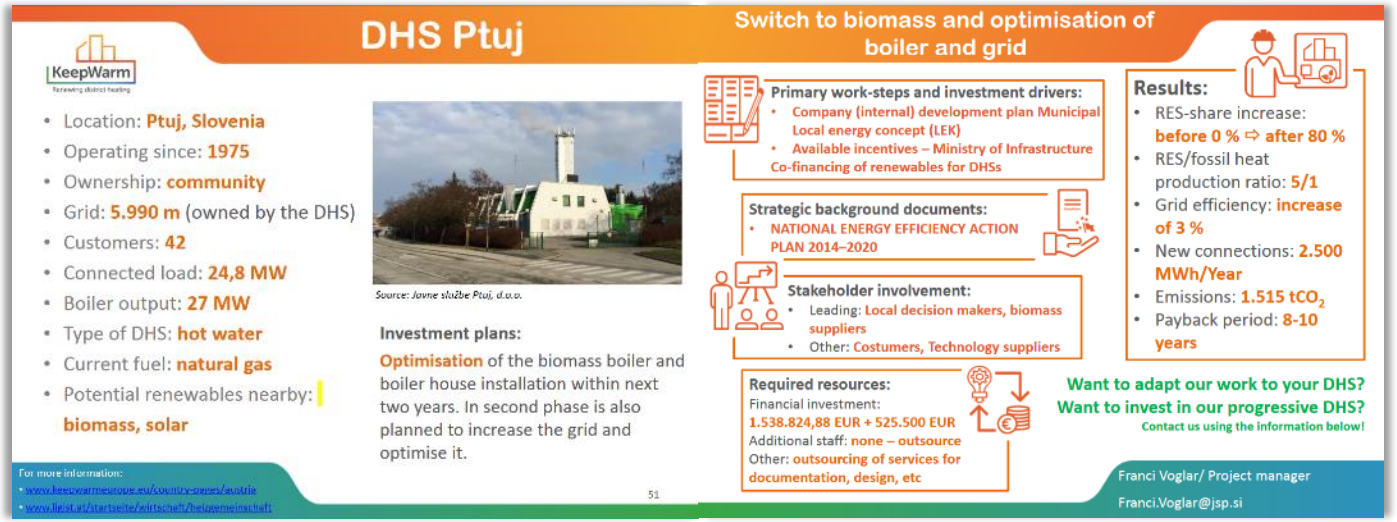
4th Using waste-to-energy solutions in line with waste-reduction strategies

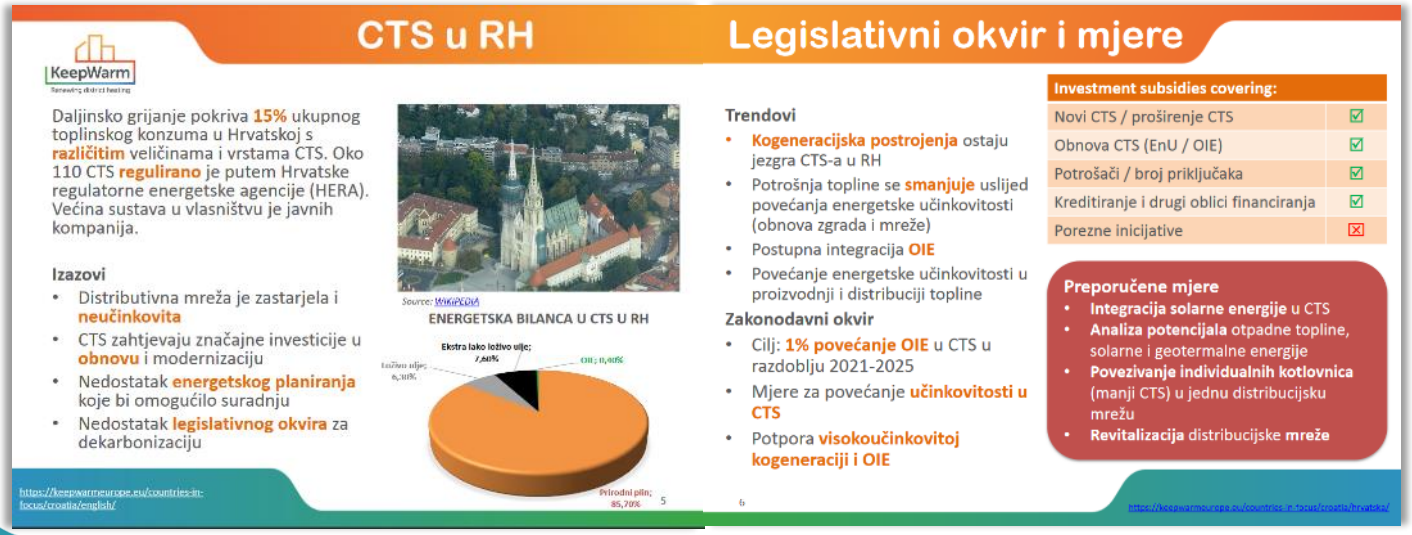
5th Deploying smart heat distribution and control management systems

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

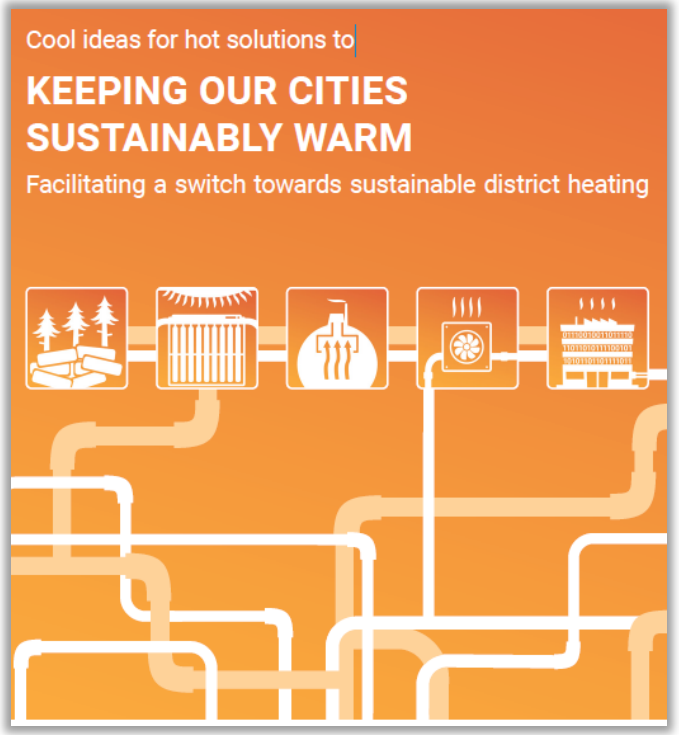




GUIDANCE ON DH FUELED BY SUSTAINABLE ENERGY

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 exccess heat for policy-makers and public authorities
- Point out **emerging (business) roles** for other companies/stakeholders



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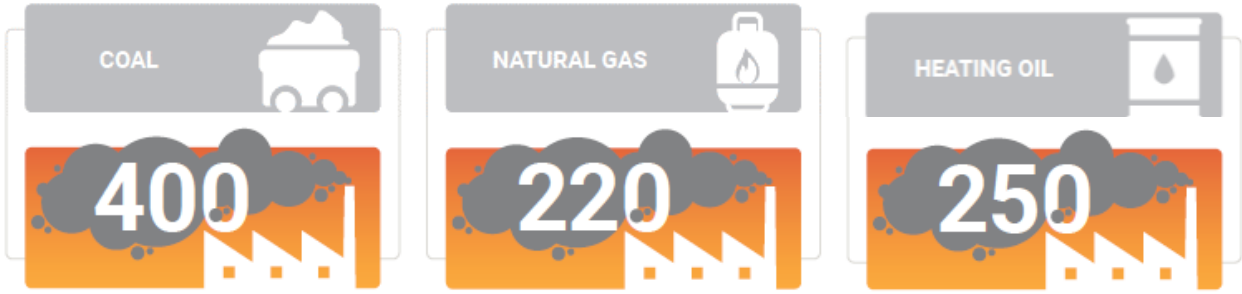
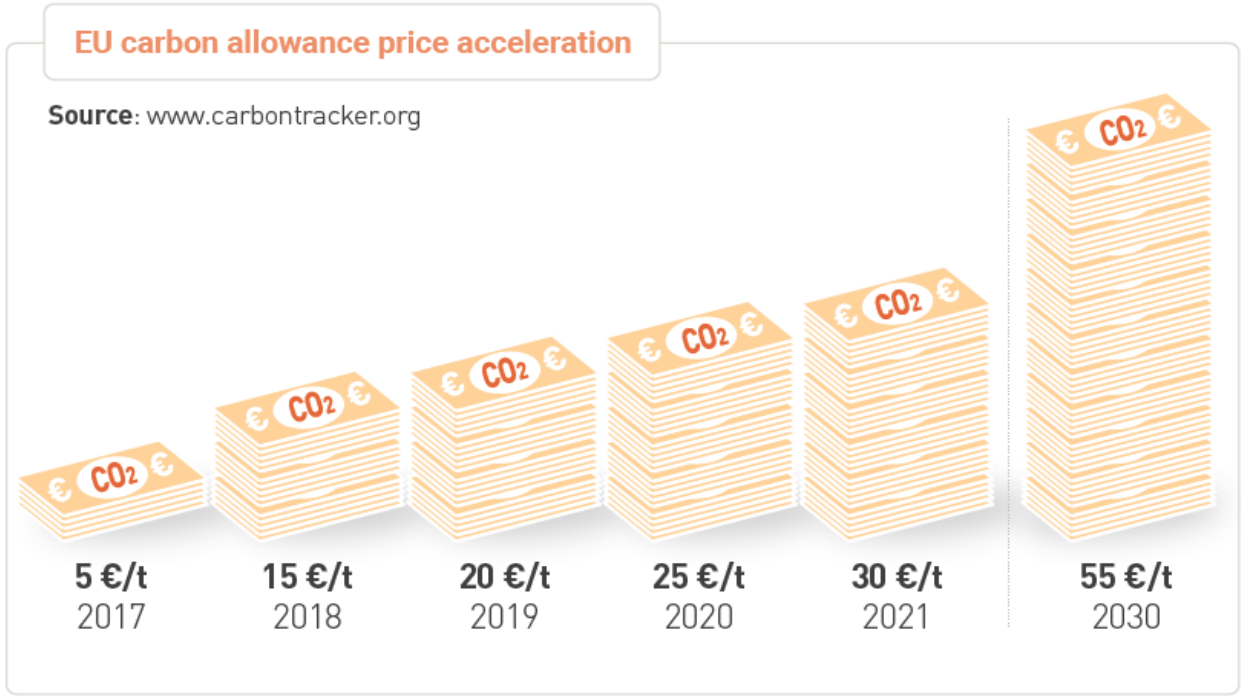
WHY DECARBONISE DISTRICT HEATING?

- **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





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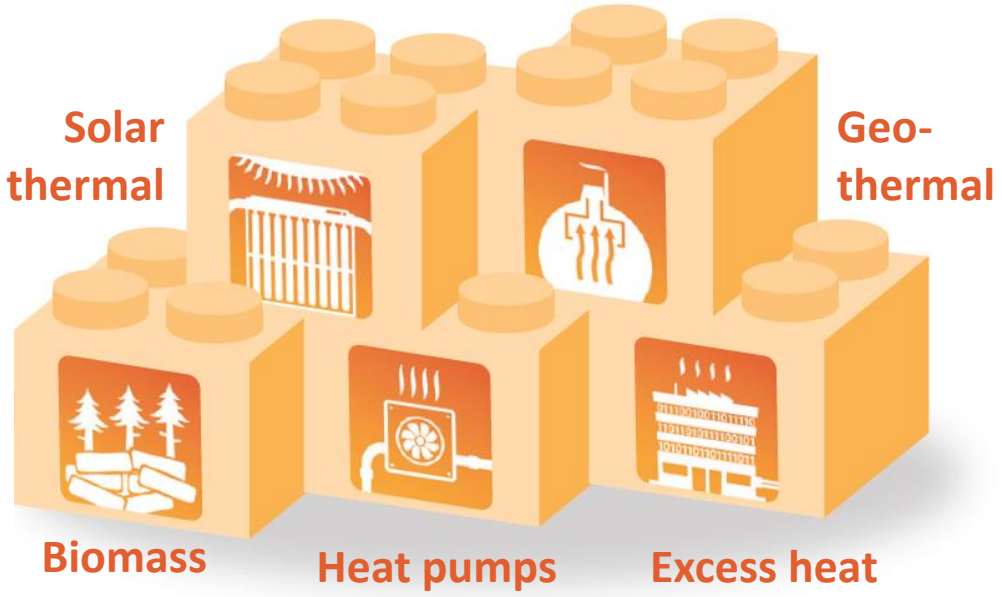
How do sustainable energy sources stack up?



Technical characteristics:

- *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**

Financial data:

- *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**

Stakeholder engagement:

Beyond the general stakeholders and their roles mentioned near the end of this document, and providers of needed technologies, biomass requires special involvement with:

- **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** - use for understanding fuel availability and sustainability

0

Greenhouse gas emissions: 0 kg/M

Even if including the transport of biomass fuel as well, though this usually counts as transport instead energy generation, the entire bioma cycle still only releases 30 kg/MWh.

Technical characteristics:

- *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

Financial data:

- *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**

Stakeholder engagement:

Beyond the general stakeholders and their roles mentioned near the end of this document, and providers of needed technologies, geothermal requires special involvement with:

- **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, thermoclines, water flow...)

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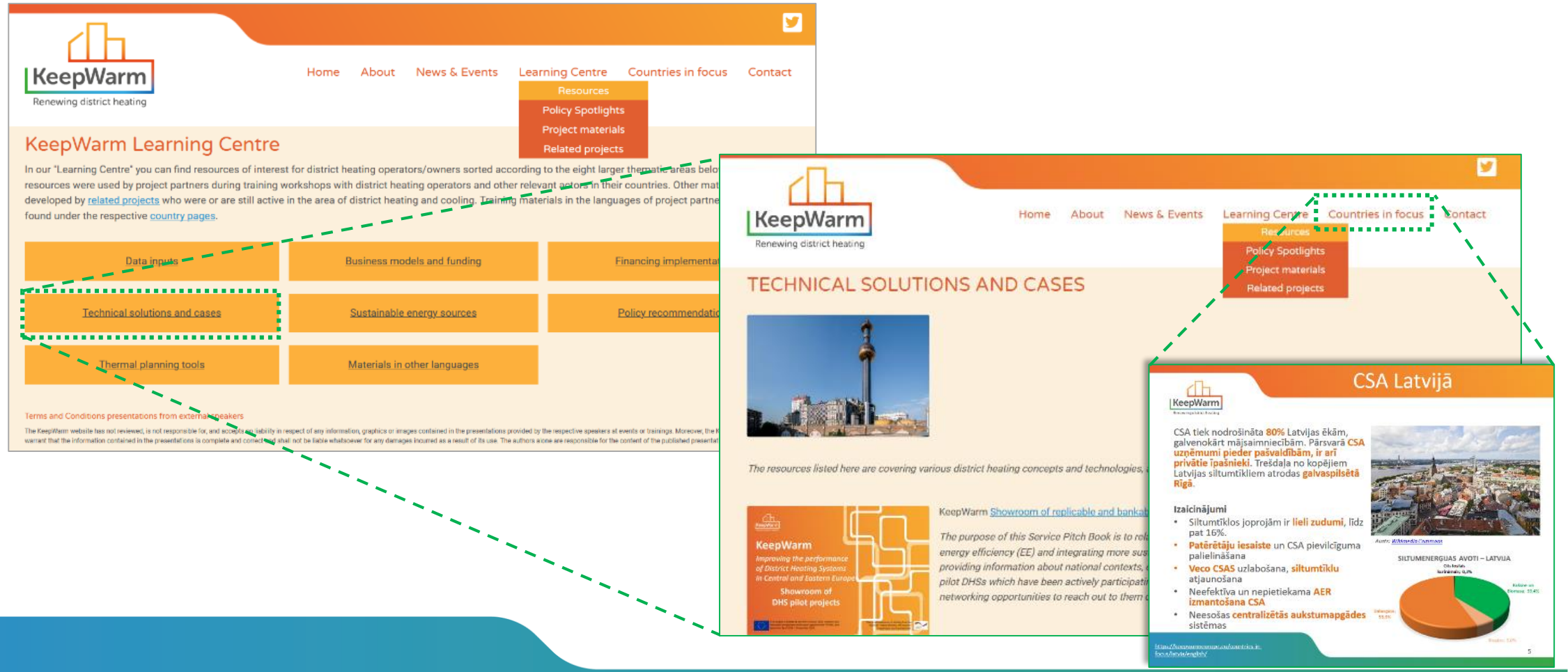
Greenhouse gas emissions: 0-10 kg/MWh

The upper value takes into account the entire geothermal process, but otherwise geothermal frequently is just considered to be **emission-free**.

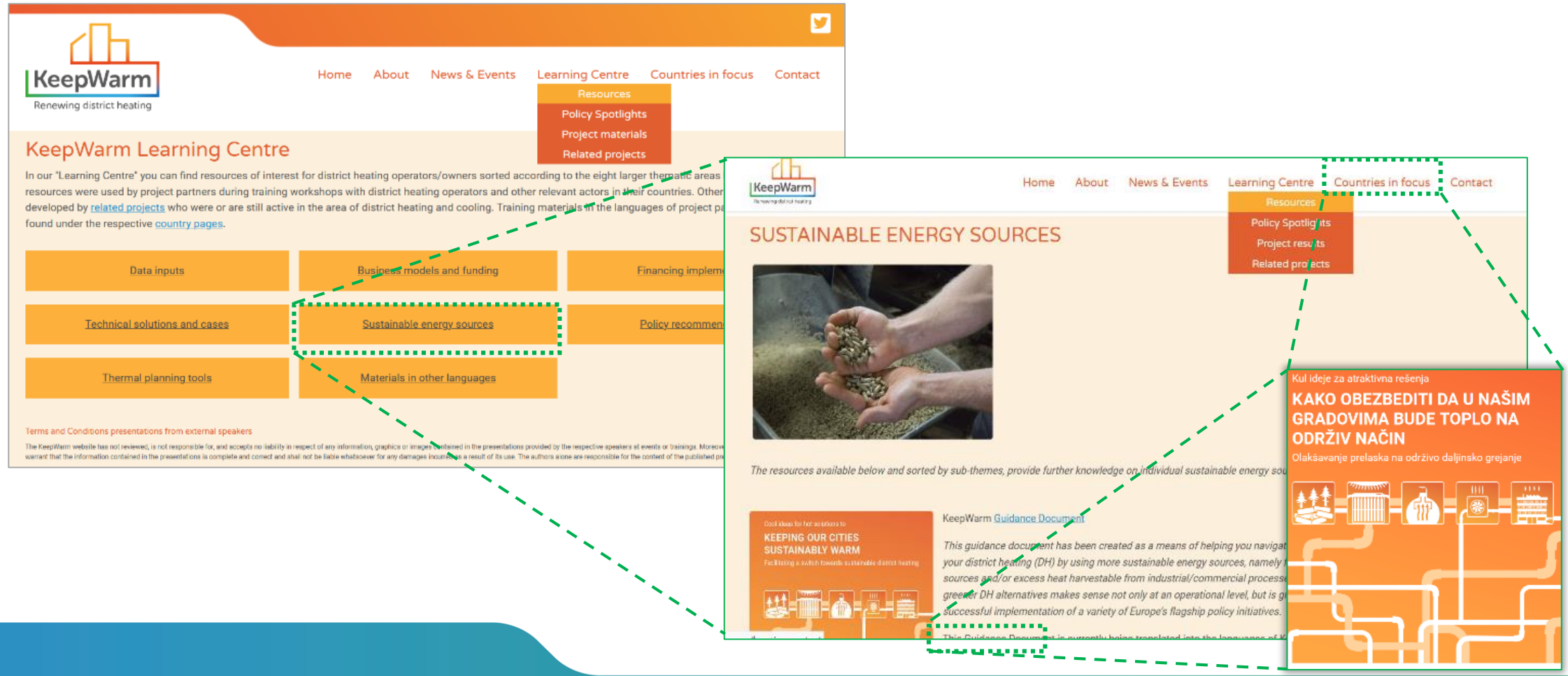
ACCESSIBILITY OF THE KEEPWARM SHOWROOM

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



ACCESSIBILITY OF THE KEEPWARM GUIDANCE BOOKLET

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



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!

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KEEP CALM & KEEPWARM with DISTRICT HEATING

Thank you! Questions?

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

visit our website:	*contact* us at:	*follow* us on Twitter:
www.KeepWarmEurope.eu	info@keepwarmeurope.eu	@KeepWarm_EU

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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