CEE Bankwatch Network

CAN CLIMATE ACTION NETWORK Europe

EUROPE BEYOND COAL

Briefing Paper - March 2022

Efficient district heating in CEE-countries

The role of the Energy Efficiency Directive for public finance mechanisms

Main recommendations for the revision of the Energy Efficiency Directive

1. The definition of an efficient district heating and cooling system should promote an exclusively renewable energy system in combination with a reduction of energy needs.
2. Heating and cooling assessments and plans need to align with climate neutrality by 2040.
3. A clear fossil fuel phase-out in heating and a stop in promoting a switch from coal to fossil gas are indispensable.

1. Introduction

Russia's invasion of Ukraine has revealed Europe's dependency on fossil fuels. The European Commission recently presented a Communication called Repower EU[1] with the aim to make Europe independent from Russian fossil fuels well before 2030, starting with fossil gas. Energy efficiency measures that bring energy savings, like switching from inefficient to more efficient district heating networks that are based on exclusively renewable energy, are part of the solution and can structurally help solve EU dependency from energy imports.

District heating (DH) systems are widely developed in Nordic and central and eastern European (CEE[2]) countries. Member States like Czechia, Denmark, Finland, Germany, Poland and Sweden use district heating systems more than the rest of the EU. However, looking at them more closely, these systems differ significantly between countries due to varying energy mixes, technologies deployed, socio-economic growth dynamics as well as in terms of renewable energy penetration and heat market structure. In most CEE countries, DH is traditionally widespread.[3]

1.RePower EU: https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1511

2. For the purpose of this briefing, CEE countries comprise of: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Romania, Slovenia, Slovakia.

3. Percentage share of district heating in energy consumption for heating (2015): Poland: 25%, Czech Republic: 20%, Slovakia: 21%, Lithuania: 42%, Latvia:36%, Bulgaria: 22%, Estonia: 39%, Hungary: 10%, Romania: 15%, Croatia: 7%, Slovenia: 12% (Source of Data: JRC (2019: Decarbonising the EU heating sector)

While modern district heating systems can significantly contribute to the integration of renewable energy in order to decarbonise our energy system, many of the existing systems in CEE are still highly inefficient and heavily reliant on fossil fuels, such as oil, fossil gas[4] or coal[5]. Old, inefficient and unreliable energy system infrastructure, high losses of heat, low environmental standards, lack of proper maintenance, high operating and maintenance costs, loss of consumers through disconnection and a need for high investment combined with a lack of financial resources are among the challenges to achieving efficient and decarbonised DH in the region. CEE countries' DH systems were mainly designed and are currently operated for high temperatures and are supplying an inefficient building stock.[6] For a swift and effective energy transition, it is indispensable to improve the energy performance of buildings connected to district heat networks in parallel to integrating more renewable heat into the district heat networks.

A robust EU policy framework[7] and adequate funding instruments can pave the way to increase energy efficiency of heating systems, introduce deep renovations, reduce emissions and allow the transition to fully renewables-based heating and cooling supply in combination with the reduction of energy needs. This would also contribute to alleviating energy poverty.

The Energy Efficiency Directive (EED) includes provisions that are relevant to the upgrade of heating and cooling energy systems, including district heating. However, experience has shown that some of these provisions leave room for Member States to consider and rely on fossil gas as a "transitional fuel" in order to modernise their district heating systems, risking a lock-in into fossil fuels. With the revision of the EED, which started within a set of legislative proposals under the Fit for 55 package released in mid-July 2021, some improvements have been proposed by the European Commission, but the heating and cooling provisions are still lagging behind.[8] Providing sound legislation for DH to enable a swift modernisation towards renewable energy in combination with the reduction of energy needs is important also because the provisions in the EED are used to grant State aid and funding through EU programmes and funding tools, including the investments covered by the Modernisation Fund, a dedicated instrument for 10 lowest-income EU countries.

This briefing gives an introduction to the relevant provisions of the EED and its impact on State aid and EU funds that help finance so-called efficient district heating systems. It includes examples of district heating programmes and projects that start transitioning towards higher energy efficiency and more sustainable renewable energy. Lastly, policy recommendations for an ambitious revision of the heating and cooling provisions of the EED are given in order to pave the way to achieve climate neutrality by 2040 and avoid the risk of a lock-in into fossil fuels.

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4. Methane (the main component of fossil gas) leaks across the entire fossil gas supply chain, from extraction, production to transportation. Methane emissions have already contributed as much as 0.5°C to the global warming experienced today.
5.Jožef Stefan Institute - Energy Efficiency Centre (2020): Keep Warm. Improving the performance of District Heating Systems in Central and Eastern Europe. Development of Multi-level policy Plans –Action plans for retrofitting of District Heating Systems.
6. Hamburg Institute & Euroheat and Power (2021): Renewable Energy Sources in District heating and Cooling EU Level Survey, Page 8
7. District heating is affected by various laws and policies, at EU, national and local levels.
8. For more information, please look at the Position Paper on the Energy Efficiency Directive by CAN Europe

2. The Energy Efficiency Directive and its implications for financing district heating and cogeneration

The EED, which entered into force in 2012, aims to promote energy efficiency measures to increase energy savings throughout Europe. It sets rules and obligations for achieving the overall energy efficiency target for the European Union, but also the framework for heating and cooling planning by the Member States. Under the current Directive (2012/27/EU), Member States need to identify the potential of high-efficiency cogeneration and efficient district heating and cooling in compulsory and comprehensive heating and cooling assessments[9] in Article 14 of the EED. In this context, the criteria defining efficient district heating and cooling[10] in Article 2 (41) of the EED and high-efficiency cogeneration[11] in Annex II are of relevance, as they are largely linked to fossil fuels, like coal and fossil gas and are used to facilitate the funding of DH. Depending on the outcome of the comprehensive assessments, Member States need to develop measures to facilitate tapping into this potential.

Financing for the implementation of the EED to build or refurbish efficient DH or refurbish old ones to become efficient DH often comes from the various EU funds and/or State aid, which is a national subsidy to be authorised by the European Commission according to the Guidelines on State aid for climate, environmental protection and energy ('CEEAG')[12]. The CEEAG, as well as the legislation of several EU funds, aligns with key provisions on heating and cooling within the current EED.

According to the Impact Assessment of the EED recast proposal[13] Article 14 of the existing Directive has, for example, promoted high-efficiency cogeneration and the reconstruction of district heating systems under the European Regional Development Funds (ERDF) and Cohesion Funds (CF) funds, which amounted to EUR 5.028 billion between 2014 and 2019. In addition to ERDF and CF, there are several other funding sources that can be used to build efficient DH such as the Life and Horizon programmes, and the newly introduced Modernisation Fund,[14] among others. This briefing will not look at all the funds that are related to energy efficiency and district heating, but only a few of the main ones.

The current EED criteria still allow financing approved under State aid rules or within the ERDF, CF and Modernisation Fund to be granted to installations that will have lifetimes significantly beyond 2030. These installations will be major emitters of greenhouse gases.

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9. According to Article 14, MSs must carry out comprehensive assessments of the potentials for increasing energy efficiency with high-efficiency cogeneration and efficient DHC. A repository of past comprehensive assessments by EU countries can be found under the following link: https://energy.ec.europa.eu/topics/energy-efficiency/heating-and-cooling_en#comprehensive-assessments
10. The definition of efficient district heating and cooling in can be found in Article 2.41 of 2012/27/EU: 'efficient district heating and cooling' means a district heating or cooling system using at least 50 % renewable energy, 50 % waste heat, 75 % cogenerated heat or 50 % of a combination of such energy and heat.
11. According to definition embedded in EED high-efficiency cogeneration shall fulfil the following criteria: –cogeneration production from cogeneration units shall provide primary energy savings calculated according to point (b) of at least 10 % compared with the references for separate production of heat and electricity;, – production from small-scale and micro-cogeneration units providing primary energy savings may qualify as high-efficiency cogeneration;.
12. State aid Energy and Environmental Aid Guidelines (EEAG) were revised, adopted as Climate, Energy and Environmental Aid Guidelines (CEEAG) in December 2021 following the Commission's initiative to align competition policy with the European Green Deal; revised guidelines became operational in February 2022: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.C_.2022.080.01.0001.01.ENG&toc=OJ%3AC%3A2022%3A080%3ATOC
13. Impact Assessment report accompanying the EED recast proposal, page 40
14. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32018L0410

There is a risk that substantial State aid and EU funds allocated in the 2020-2027 MFF, as well as the ETS Modernisation Fund, for fossil gas infrastructure will lead to the EU missing its emission reduction targets for 2030. In light of the Russian invasion of Ukraine, it has become even more evident that we need to phase out fossil fuels as quickly as possible.

It is important that any incremental change to make DH and cogeneration installations more efficient is not used as an excuse to prolong Europe's reliance on fossil fuels, especially on coal and fossil gas, which are the heat sources for large installations. The source of energy used needs to be looked at in order to help channel public money away from fossil fuels towards a just energy transition and to avoid stranded assets.

I. The Guidelines on State aid for climate, environmental protection and energy (CEEAG)

The CEEAG renders 'efficient district heating and cooling' as well as 'high-efficiency cogeneration' facilities eligible for State aid, based on the definitions provided in the EED. The primary rationale for allowing State aid for all projects is to 'contribute in addressing the market failures derived from the environmental externalities and inefficiencies of installations'. For DH and cogeneration facilities, State aid is justified to trigger further investments in making them fit for the EED-defined efficient and high-efficiency status.

New provisions in the revised guidelines regarding aid for fossil gas infrastructure, including DH and cogeneration, require Member States to prove that aid will help them achieve the EU's 2030 emission reduction targets and 2050 climate neutrality objective, and would avoid a lock-in effect. In this sense, the efficient DH and high-efficiency cogeneration criteria provided by the EED play a major role because any additional aid for new DH and cogeneration facilities running on coal or fossil gas would create a lock-in to fossil fuels for decades while increasing households' exposure to volatile fossil fuel prices.

II. European Regional Development Fund

District heating projects can be funded by the current ERDF under special conditions called enabling conditions, including compliance with the EED. On district heating, the legal text makes a direct reference to the Directive: 'In the case of district heating/cooling, if the associated infrastructure follows Directive 2012/27/EU (…)'.[15] Article 7 of the ERDF and the Cohesion Fund regulation sets the conditions for the exclusion of certain investments from the scope of the two Funds. Even if prerequisites for funding fossil gas are significantly tighter in the 2021-2027 budget, the rules set in the ERDF support the replacement of solid fossil fuels fired heating systems (coal, peat, lignite, oil-shale) with gas-fired heating systems in order to upgrade DHC and CHP, based on the current definition of efficient DHC in Article 2 of the EED.

15. EUR-Lex - 32021R1060 - EN - EUR-Lex (europa.eu)

III. Life and Horizon Europe

Within the LIFE Programme, DHC projects have been funded in the past in order to implement the EED. Innovative projects for DHC projects can be funded through the EU programme for research and innovation, Horizon Europe. A set of calls for research in energy use should contribute to the "efficient and sustainable use of energy, accessible for all is ensured through a clean energy system and a just transition", taking into account the EU policy context including the EED. These are highly innovative and collaborative projects, involving mainly businesses, research institutes and universities. Moreover, the Horizon programme funds actions related to urban challenges and will fund projects promoting district and community approaches leading to zero-energy or even positive energy districts (e.g. advanced district heating and cooling systems with large potential for renewables and waste-heat recovery).

IV. Modernisation Fund

The ETS Modernisation Fund[16] is a brand new financing instrument that started operating in 2021, as a separate but complementing tool to the EU Funds that are part of the EU long term budget. In the current set-up at least 70 percent of the Fund allocation is to be used to support 'priority investments' in renewables, energy efficiency, energy storage and the modernisation of energy networks, including district heating networks, grids for electricity transmission and interconnections. Investments in energy efficiency in transport, buildings, agriculture, and waste can also be eligible. According to the ETS Directive, as the legislative basis of the Fund[17],in order to qualify for funding within its framework, CHP projects must be in line with the EED definition of 'high efficiency cogeneration' .[18]In theory this means gas-based cogeneration can be justified as a priority project and financed from the Fund, as an improvement of energy efficiency.

It shall be noted that the size, scope and criteria of the Modernisation Fund can change in 2023, as part of the Fit for 55 package negotiations.

16. The Modernization Fund is a dedicated funding programme to support 10 lower-income EU Member States in their transition to climate neutrality by helping to modernise their energy systems and improve energy efficiency. What is important to note, this budget is derived from dedicating 2% of EU ETS allowances for the period 2021-2030, which can provide €19-25 billion in revenues, depending on the carbon price. Unlike other EU Funds, the Modernisation Fund is not linked to usual process of MFF programming, so it is available to Member States since the beginning of 2021.
17. See Article 10d
18. Article 10a: high-efficiency cogeneration, as defined by Directive 2012/27/EU of the European Parliament and of the Council, for economically justifiable demand, in respect of the production of heating or cooling.

Planned projects in Poland and Slovakia potentially based on fossil fuels

The first projects were already approved in 2021[19] for Poland and Slovakia, with three co-generation investment schemes that can be based on gas (among others). The two projects in Poland are for high-efficiency cogeneration (excluding energy generated in a coal-fired cogeneration unit), but include low-emission gaseous fuels, gas mixtures, synthetic gas or hydrogen and for the use of waste for energy purposes in DH. The Slovak example would enable the modernisation of existing CHPs and the construction of new high-efficiency CHPs. In all 3 cases, these are multi-annual investment schemes, which also means that once approved they will just be renewed yearly. Full expected funding, according to files submitted by Poland and Slovakia for this purpose, reaches EUR 1.4 billion.

19. https://modernisationfund.eu/governance/european-investment-bank/, see projects MF 2021-2 SK 0-002, MF 2021-2 PL 0-002 and MF 2021-2 PL 0-003

3. Examples of district heating programmes with EU support

Today there are several examples of district heating programmes in CEE countries that are in transition to showcase higher energy efficiency, leading to energy savings, and the incorporation of sustainable renewable energy, rather than fossil fuels. The CEE examples that are displayed in this briefing are not necessarily good practice examples as fossil fuels are still included and the transition is happening too slowly, but they are steps in the right direction. In any case, heating and cooling provisions in the Energy Efficiency Directive need to be strengthened, so they can steer public funds towards good practice projects, which in turn can support the energy transition in line with climate neutrality.

Zagreb County, Croatia - using solar thermal to provide heat

District heat supplies 14 per cent of the total heat demand in Croatia and 11 per cent of households[20]. While this is a rather small percentage compared to other CEE countries, the challenges are typical for the region. There is an ageing network, with pipes on average around 40 years old, with significant heat losses and a building stock that needs renovation and modernisation, thus requiring significant investments. Its DH system is primarily fossil gas-based, 80 per cent from CHPs. Yet there is interest within the country to incorporate more renewable heat sources and they are currently developing solar thermal energy technology around its capital, Zagreb.

In a project financed by Horizon 2020 which began in 2018 and finished in 2020, "Keep Warm," pre-feasibility studies were developed for the integration of solar fields in Velika Gorica, Zaprešić, and Samobor, all of which are towns close to Zagreb. As a follow up to these studies, another project, 'City Storage and Sector Coupling Lab,' financed by the ERDF, will turn these sites into demonstration sites to be used for capacity building throughout the region[21].

Zagreb, Croatia. Source: Mislav Vidovic from Getty Images

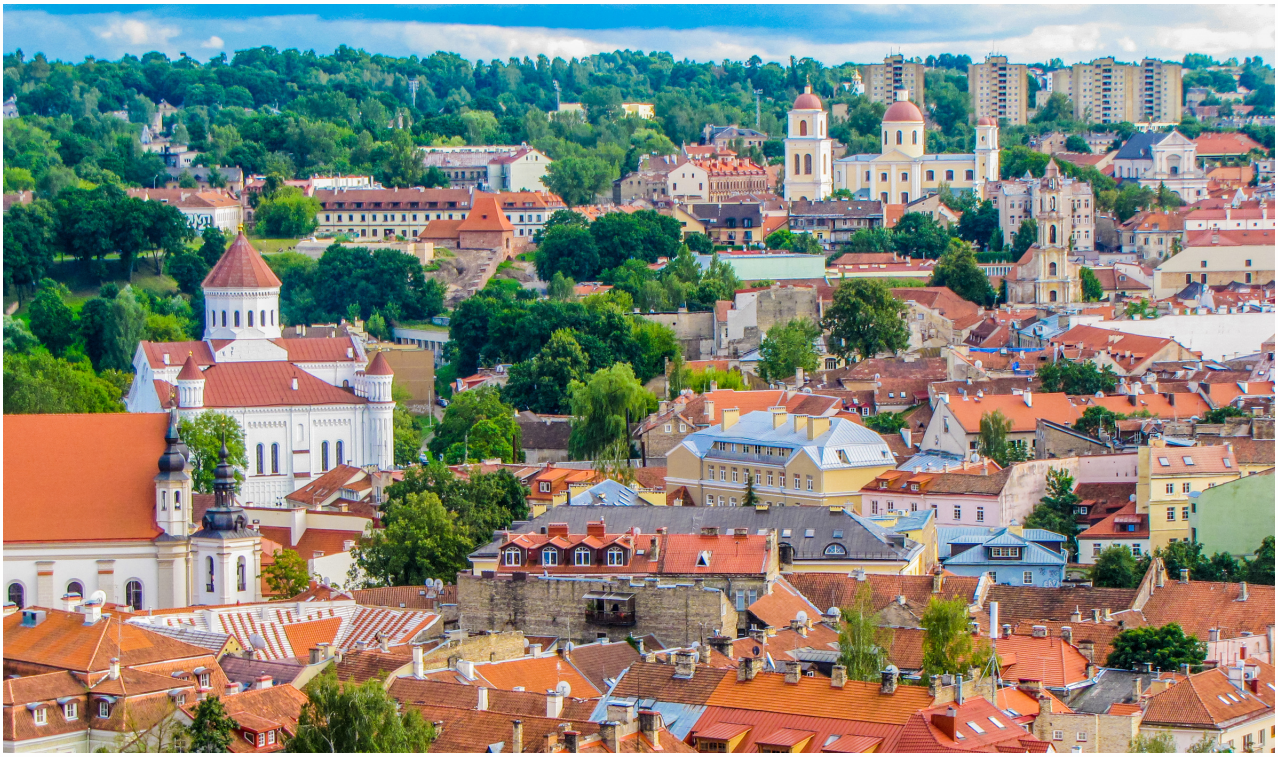
20. https://ec.europa.eu/energy/sites/default/files/documents/croatia_report_eed_art_141update_en.pdf
21. https://www.interreg-danube.eu/approved-projects/cssc-lab

Vilnius, Lithuania - away from gas boilers towards solar thermal energy, heat pumps and waste heat

District heating supplies heat to more than 50 per cent of households in Lithuania[22] and covers 33 per cent of the annual heat supply for its capital, Vilnius. From its Soviet legacy, it has a rather old but extensive district heating network which until 2013 was fueled by fossil gas or heavy oil imported from Russia. In an effort to be more energy-efficient, the country began to diversify its energy supply rapidly and now uses primarily locally-sourced biomass. This however still raises concerns about greenhouse gas emissions, air pollution and impact on forests.

Through a EUR 90 million investment from the EU's Cohesion Funds, Vilnius built a new biomass CHP finalised in 2021 to replace existing fossil gas boilers. But what is more promising is that the Vilnius District Heating company plans to further diversify its heat sources beyond biomass and to incorporate solar thermal energy, heat pumps[23], and waste heat from retail centres[24] or wastewater treatment plants.[25]

In order to do this, the network needs to be modernised to be able to incorporate lower temperature renewables as most of the current network still requires high temperatures and there are significant heat losses. With a EUR 43 million investment from the European Investment Bank, the company has begun to upgrade its system to reduce heat losses and optimise the heat supply to consumers. Additionally, in 2021, Lithuania obtained EUR 20 million from the Modernisation Fund for investments into building insulation in the 2022-2027 period. The objectives of the scheme are to improve energy efficiency and reduce greenhouse gas emissions through the renovation of public buildings owned by municipalities.



Vilnus, Lithuania. Source: Diego Fiore from Getty Images

22. https://ec.europa.eu/energy/sites/default/files/documents/Art%2014Lithuania_EN.pdf
23. https://www.nordicenergy.org/wordpress/wp-content/uploads/2021/04/Heat-Pump-Potential-in-the-Baltic-States.pdf
24. https://www.reuseheat.eu/replication-study-waste-heat-recovery-datacentre/
25. https://lsta.lt/wp-content/uploads/2020/09/6_Paulius_Martinkus.pdf

Miskolc, Hungary - geothermal district heating

Geothermal based heat is mostly underutilised in Europe, in Hungary there are still vast untapped deposits. In the last 15 years, several settlements have begun to harness that energy for district heating (bigger cities like Szeged, Győr, Hódmezővásárhely; small cities: Veresegyház, Szentes, Csongrád, Vasvár, Szentlőrinc, Makó), through transitioning by either expanding and upgrading their existing DH system through adding geothermal wells & systems into it, or developing a new geothermal (cascade) system. Most of these projects (partly) use EU Funds for this. One of the "expanders-upgraders" is Miskolc, the fourth biggest city in the country, with a population of over 160,000. Half of the residents are connected to the DH system, and over half of the system's heat supply is now geothermal-based; the geothermal plant and system started operating in 2013. The project was carried out using EUR 25 million from Operational Programme funding. This helped to build the initial geothermal system including two input and three output wells, a heat centre and pipelines, and has helped to connect new buildings to the system. Given geothermal's high upfront costs but low maintenance costs, seeing how EU investments can be used to build the system can serve as an important lesson for other geothermal hotspots[26]. In case of Szeged, by 2023, the 9 new geothermal wells will substitute half of the fossil gas supplies (15 million m3 fossil gas spared), with 24 million eur EU Funds. As Budapest would like to protect its thermal baths/waters, geothermal DH developments are mainly expected in the agglomeration of Budapest.

Miskolc city, Hungary. Source: bartoshd from Getty Images

26. More information available here 2018-12-14_Hot_Cool_4_2018-2.pdf (tavho.org) or here With EU Funds, towards a cleaner heating system in Miskolc, Hungary - People's Budget (peoplesbudget.eu)

4. The need for an ambitious revision of the EED

There is great potential for energy savings from heating and cooling for the CEE district heating sector, which the current EED does not yet adequately promote.[27] Upgrading the EED provisions on heating and cooling to enable sustainable and fully renewables-based heating and cooling systems, combined with a shift in buildings renovation and the reduction of energy needs, is a must in order to bring about important benefits for CEE-countries. These include reducing greenhouse gas emissions, lowering energy poverty, reducing the EU's import dependence, reducing energy bills for industry, SMEs and households and improving air quality.

In mid-July 2021, the European Commission proposed the EED recast, laying down more comprehensive planning rules on heating and cooling including the follow-up of comprehensive assessments on heating and cooling and the preparation of local and regional heating and cooling plans.

Despite providing some first good signals in the proposal, the heating and cooling provisions tabled, including on the heating and cooling assessments, are still insufficient to steer us towards climate neutrality.

The proposal fails to introduce a swift change towards a 100 percent sustainable renewable energy system by 2040 in combination with the reduction of energy needs and a fossil fuel phase-out, which needs to be ensured in cross-compliance with the Renewable Energy Directive and the Energy Performance of Buildings Directive to have a consistent approach and holistic planning.

The proposed criteria for efficient district heating and cooling and for high-efficiency cogeneration would still allow yet more State aid and EU funds to be provided to fossil gas DH, even though the use of coal in cogeneration is incentivised less.[28]They encourage a switch from coal to fossil gas-fired CHP until 2035[29]and are likely to lock DH systems into a fossil fuel that is not compatible with the trajectory to climate neutrality by 2040.[30] The EED revision should not be a means to prolong fossil fuel-based heating in the region, but used as a major opportunity to decarbonise the EU heating sector in CEE-region, based on energy savings and renewable energy.

27. Impact Assessment report accompanying the EED recast proposal, page 19
28. Certain exemptions are given to the lowest income Member States to use the Modernisation Fund for high-efficiency CHP using coal
29. The emission level for high efficiency cogeneration in the proposed Annex III of the EED recast proposal mandates that direct emissions of the carbon dioxide from cogeneration production that is fueled with fossil fuels, are less than 270 gCO2 per 1 kWh of energy output, which does not exclude new gas-fired CHP, but does exclude coal-fired CHP. As such, a switch from coal to fossil gas-fired CHP is encouraged, which have a lifetime of around 20-30 years. This should be seen in combination with having high- efficiency cogeneration based on the above definition in efficient district heating and cooling until 2035 in the proposed Article 24. In the EED recast proposal, Article 24 is linked to Article 2, which is being used for granting state aid and serve as a basis for several EU funds.The EED recast proposal also explicitly mentions that new and refurbished DHC and cogeneration units should not increase the use of fossil fuels except for fossil gas.
30. For more information, please look at the Position Paper on the Energy Efficiency Directive by CAN Europe

To make the EED revision use this opportunity, the revision needs to ensure that heating and cooling assessments and plans including at the regional and local level are aligned with the climate neutrality goal by 2040, support the energy transition, modernise district heating systems and give investment certainty. At the same time, it is indispensable for the EED revision to introduce a clear fossil fuels phase-out requirement in heating and cooling including for efficient district heating towards a phase out of coal by 2030 at latest and of fossil gas by 2035. A shift to a fully sustainable renewable energy system means it is imperative to stop promoting a switch from coal to fossil gas for CHP and efficient district heating and cooling in the coming years, but also to prevent using more unsustainable biomass or municipal waste burnt in waste incinerators.

The following organisations have endorsed this briefing

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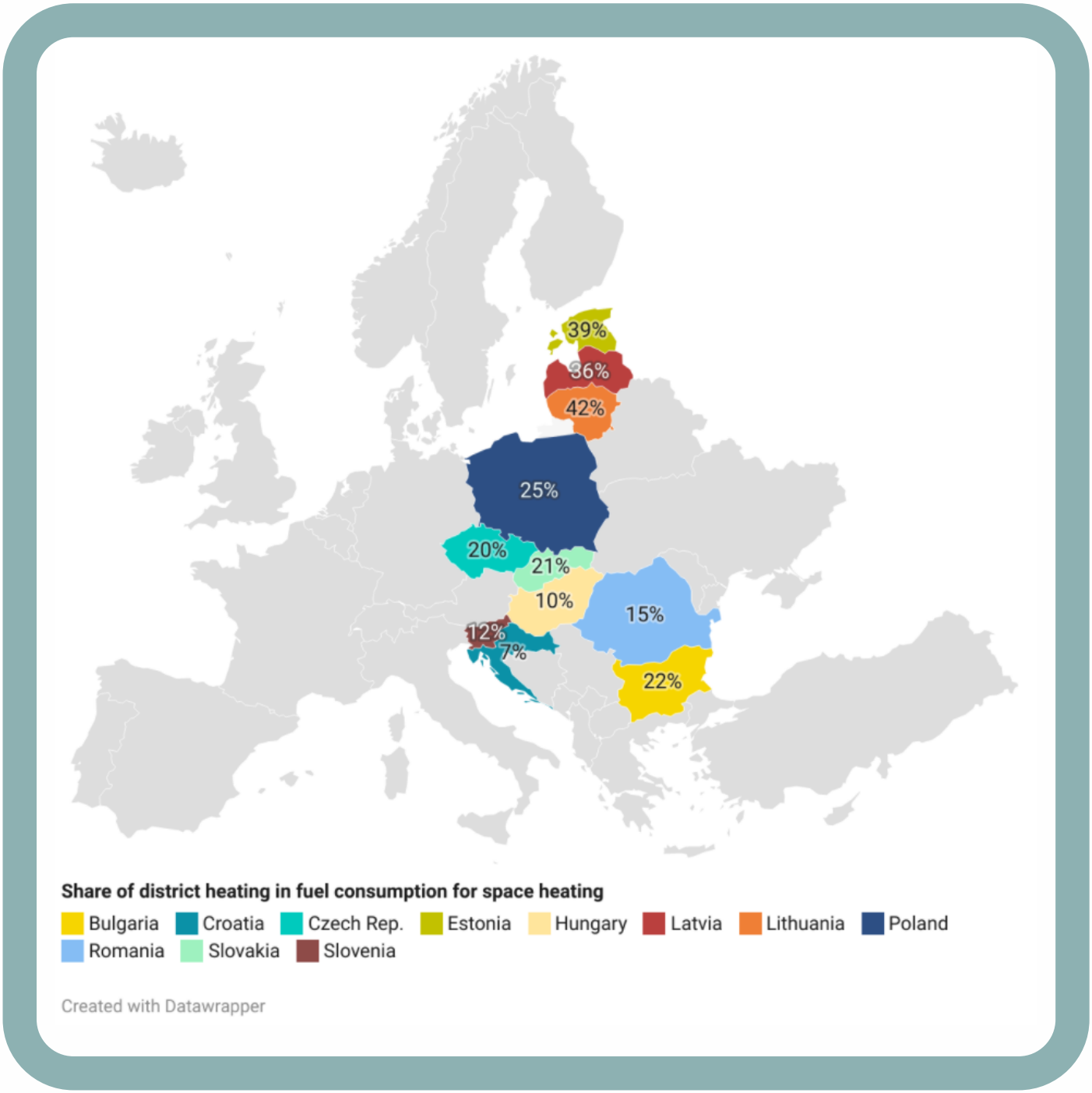
Annex I - DH penetration for CEE countries

Country	Share of district heating in fuel consumption for space heating (Source: JRC, 2019, data from 2015)	Households connected to district heating systems (Sources: EHP Country by Country, Keep Warm Europe 2020, Cogen Romania, Worldbank Group Bulgaria)	Dominant fuel used in DHS sector (Sources: EHP Country by Country, IEA 2020, Keep Warm Europe 2020, Polish Heating Chamber of Commerce)
Bulgaria	22% (2015)	26.5% (2017)	Mainly fossil gas (no year), also lignite, biomass, waste
Croatia	7% (2015)	11% (2018)	85.7 % fossil gas (2020)
Czech Republic	20% (2015)	40.3% (2015)	50% coal (2016)
Estonia	39% (2015)	62% (2015)	/
Hungary	10% (2015)	17.58% (2017)	71% fossil gas (2017)
Latvia	36% (2015)	80% (no year)	61.2% biomass (2018)
Lithuania	42% (2015)	/	Renewable sources (no year)
Poland	25% (2015)	40% (2017)	75% coal (2016)
Romania	15% (2015)	24% (2020)	/
Slovakia	21% (2015)	35% (2015)	/
Slovenia	12% (2015)	9% (no year)	/

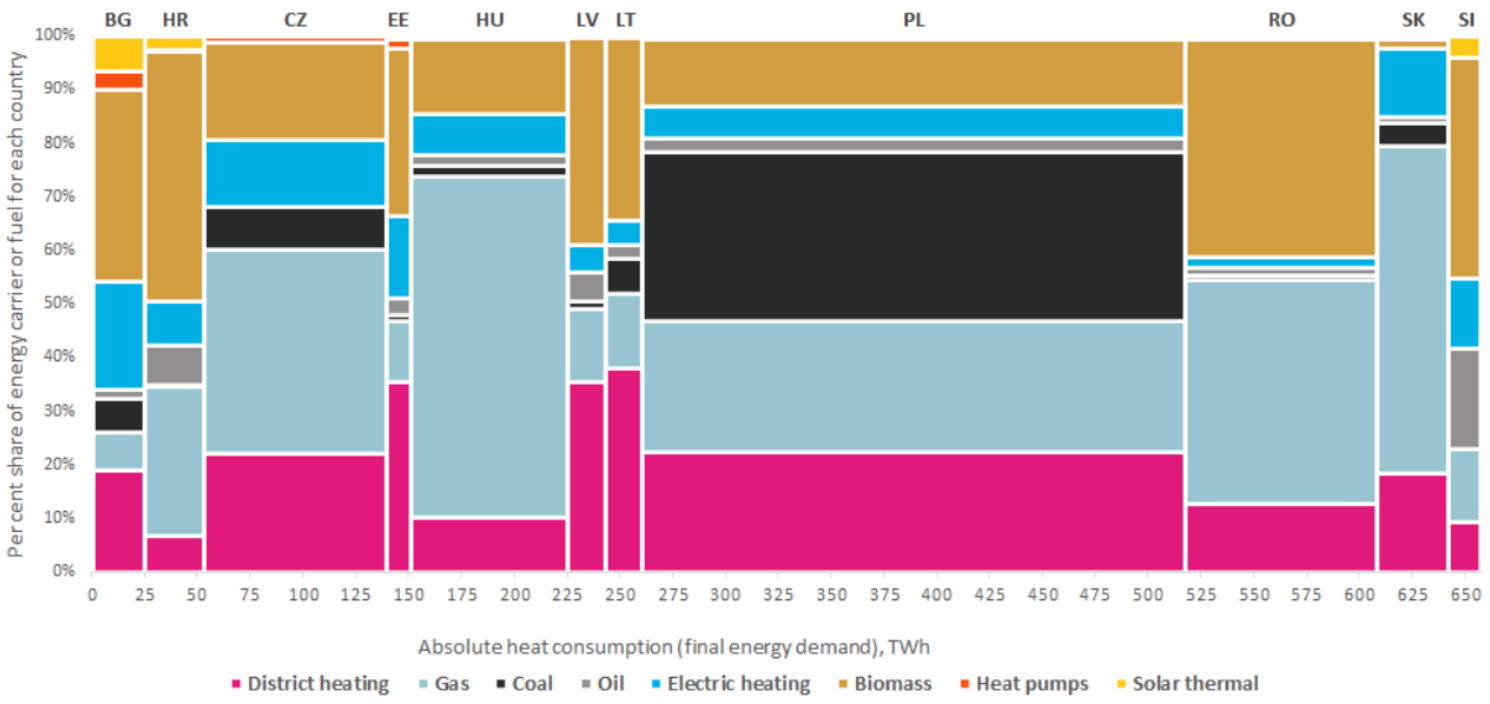
Note: *There is no consistent database which tracks the energy mix of European district heating networks. The data displayed in this table is not necessarily comparable (except for column one) due to specific differences between the way the data is collected, displayed and the differences between years.*

Share of district heating fuel consumption for space heating in CEE countries



Annex II - Heat Consumption by energy carrier (final energy demand 2015)

Heat consumption by energy carrier (final energy demand) 2015, residental + tertiary)
Y axis: share of energy carrier or fuel for reach country, X axis: absolute consumption in TWh



Source: Heat Roadmap Europe, Deliverables 3.1: Profile of heating and cooling demand in 2015 - Data Annex

Link to source file: https://heatroadmap.eu/wp-content/uploads/2018/09/HRE4-Exchange-Template-WP3_v22b_website.xlsx

Note: *Heat only (cooling excluded) for residential plus tertiary (industry excluded). Chart reading: in 2015, the total final demand for heat in the countries shown in the chart was 659 TWh (horizontal axis), the largest share of which was consumed in Poland. The vertical axis shows the relative proportion of each energy carrier in the heat consumption of each country. The categories are mutually exclusive. For instance, the coal category in the chart represents only coal used for heat in the final energy demand, but excludes coal burnt in power plants for district heating. The district heating category in the chart does not differentiate between the various fuels (coal, gas or other) that are used to supply heat in the heating network.*

Heat Consumption by energy carrier (final energy demand 2015)
Heat only (cooling excluded) for residental plus tertiary (Industry excluded)

		District heating	Gas	Coal	Oil	Others (fossil)	Electric heating	Biomass	Heat pumps	Solar thermal	Others (RES)	TOTAL
Bulgaria	TWh	4.8	1.8	1.6	0.4	0.0	5.1	9.1	0.9	1.7	0.0	**25.5**
	% country total	18.9%	7.2%	6.2%	1.7%	0.0%	20.0%	35.8%	3.6%	6.5%	0.0%	100.0%
Croatia	TWh	1.9	8.0	0.0	2.1	0.0	2.4	13.4	0.0	0.8	0.0	**28.8**
	% country total	6.7%	27.9%	0.2%	7.5%	0.0%	8.3%	46.6%	0.2%	2.7%	0.0%	100.0%
Czech Republic	TWh	18.9	32.7	6.6	0.1	0.0	10.7	15.6	0.8	0.2	0.0	**85.6**
	% country total	22.1%	38.2%	7.7%	0.2%	0.0%	12.5%	18.2%	1.0%	0.2%	0.0%	100.0%
Estonia	TWh	4.3	1.4	0.1	0.4	0.0	1.8	3.8	0.2	0.1	0.0	**12.1**
	% country total	35.3%	11.5%	1.0%	3.4%	0.0%	15.1%	31.3%	1.8%	0.7%	0.0%	100.0%
Hungary	TWh	7.5	47.2	1.4	1.6	0.0	5.5	10.5	0.2	0.2	0.0	**74.2**
	% country total	10.1%	63.7%	1.9%	2.2%	0.0%	7.4%	14.1%	0.3%	0.3%	0.0%	100.0%
Latvia	TWh	6.4	2.4	0.2	1.0	0.0	1.0	6.9	0.0	0.1	0.0	**18.0**
	% country total	35.4%	13.6%	1.4%	5.4%	0.0%	5.3%	38.4%	0.1%	0.4%	0.0%	100.0%
Lithuania	TWh	6.6	2.4	1.2	0.5	0.0	0.8	5.9	0.0	0.1	0.0	**17.5**
	% country total	37.9%	13.9%	6.7%	2.6%	0.0%	4.6%	33.9%	0.1%	0.3%	0.0%	100.0%
Poland	TWh	57.2	62.8	81.1	6.8	0.0	15.6	32.0	0.5	1.1	0.0	**257.1**
	% country total	22.2%	24.4%	31.6%	2.6%	0.0%	6.1%	12.4%	0.2%	0.4%	0.0%	100.0%
Romania	TWh	11.6	37.8	0.6	1.3	0.0	1.9	36.6	0.2	0.6	0.0	**90.4**
	% country total	12.8%	41.8%	0.7%	1.4%	0.0%	2.1%	40.5%	0.2%	0.6%	0.0%	100.0%
Slovakia	TWh	6.3	20.9	1.5	0.3	0.0	4.4	0.6	0.1	0.2	0.0	**34.4**
	% country total	18.5%	60.9%	4.4%	1.0%	0.0%	12.8%	1.7%	0.3%	0.5%	0.0%	100.0%
Slovenia	TWh	1.4	2.0	0.0	2.8	0.0	2.0	6.2	0.0	0.6	0.0	**15.1**
	% country total	9.4%	13.6%	0.0%	18.8%	0.0%	13.0%	41.3%	0.1%	4.0%	0.0%	100.0%
TOTAL	TWh	**126.9**	**219.5**	**94.4**	**17.4**	**0.0**	**51.1**	**140.6**	**3.1**	**5.5**	**0.0**	**658.5**
	% of total	19.3%	33.3%	14.3%	2.6%	0.0%	7.8%	21.4%	0.5%	0.8%	0.0%	100.0%

Source: Heat Roadmap Europe, Deliverables 3.1: Profile of heating and cooling demand in 2015 - Data Annex
Link to source file: https://heatroadmap.eu/wp-content/uploads/2018/09/HRE4-Exchange-Template-WP3_v22b_website.xlsx