

Towards efficient European heating and cooling:

Key implications of the Energy Efficiency Directive (EED) recast

Policy brief



Revamped EED for a more energy-efficient Europe

Energy efficiency is pivotal in realising the EU's climate goals while bolstering energy security and affordability. With the EU aiming for a 20% improvement in energy efficiency by 2020 (compared to 1990), recent Eurostat data for that year reveals a 5.8% decrease in primary energy consumption and a 5.4% drop in final energy consumption, both surpassing the target levels set partly also due to the onset of COVID-19 pandemics. In alignment with the EU Green Deal and its objective of reducing greenhouse gas emissions by at least 55% by 2030, the Energy Efficiency Directive (EED) has undergone a significant revision as part of the Fit For 55 package. Published in the Official Journal on 20 September 2023, the revamped EED sets a higher bar for energy efficiency, introducing several notable components poised to transform heating practices in both residential and commercial settings.

The revised directive increases the EU's energy efficiency target, mandating member states to collectively achieve an additional 11.7% reduction in

energy consumption by 2030 compared to the projected levels in 2020. It enshrines 'energy efficiency first' as a core principle of EU energy policy, giving it legal standing for the first time. This marks a significant transition towards prioritising energy-efficient solutions across planning, policymaking, and major investment initiatives. Consequently, heating solutions will undergo evaluation based on their environmental impact, with preference given to those meeting rigorous energy efficiency criteria.

The REDI4HEAT project welcomes the new additions to the EED as they will be key in driving the green transition of the heating and cooling sector.

Comprehensive heating and cooling assessments as part of National Energy and Climate Plans (NECPs).

As part of their National Energy and Climate Plans (NECPs), Member States (MSs) must submit a thorough assessment of their heating and cooling systems to the European Commission. Stakeholders affected by these assessments have the opportunity to

contribute to the formulation of heating and cooling plans.

These assessments include considerations such as conditions, economic viability, and technical suitability. Cost-benefit analyses are to be conducted to identify the most efficient solutions for meeting heating and cooling needs, prioritising energy efficiency.

Based on these assessments and analyses, MSs are required to implement measures that promote the development of high-efficiency cogeneration, efficient district heating and cooling (DHC) systems utilising waste heat, and the utilisation of renewable energy sources (RES).

Nonetheless, the text provides no details on how many and what kind of stakeholders need to be involved in the process and on the methodology to adopt for consultation. There is also no specification of which authority can be designated to be in charge of the assessment which may represent a barrier.

Introduction of local heating and cooling plans (LHCPs) to drive the decarbonisation

One of major novelties introduced by the new EED is the inclusion of an obligation for municipalities above 45,000 inhabitants to perform local heating and cooling planning (LHCPs). The obligatory nature of this measure will serve as a potent instrument for accelerating local green transitions.

While the timing for this measure is ideal as MSs are in the process of updating their NECPs, several challenges are observed.

First, the responsibility does not directly fall on municipalities due to subsidiarity; rather, it lies with MSs to transpose it at the national level and devise a framework that best facilitates the development of LHCPs, which may pose certain difficulties.

Next, the powers of local authorities vary greatly from one country to another, and most currently lack the

appropriate skills to carry out LHCPs. There is therefore a risk that if the support mechanism is not optimal, these local plans will be reworked on the margins, and will never be implemented.

Finally, while the directive makes it mandatory to set up the LHCPs, nothing is mentioned about their actual implementation which may result in a situation where many LHCPs are not effectively put in place slowing down the decarbonisation of the heating sector.

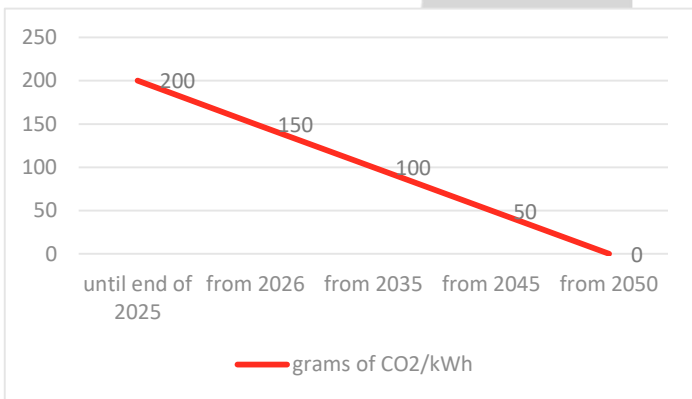
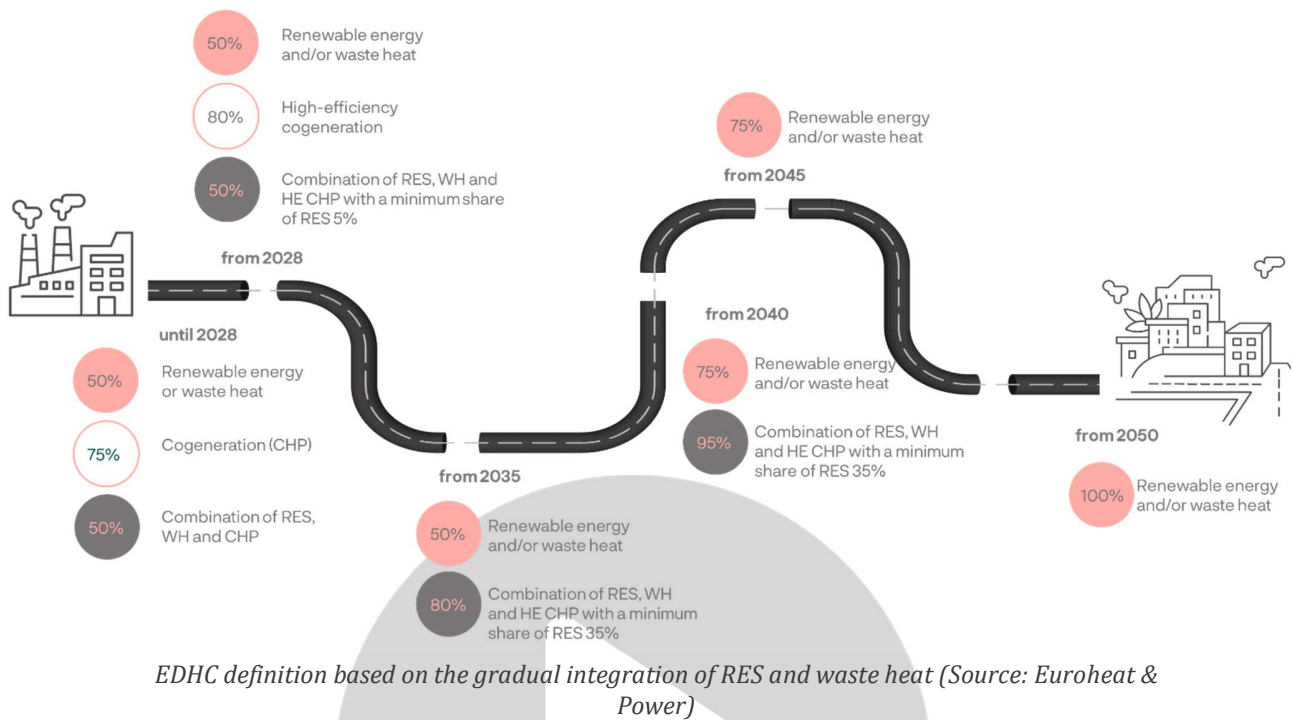
The introduction of effective support mechanisms and guidance tools by the European Union will represent a key element in the successful transposition of this measure at national level.

A decarbonisation pathway for the district heating and cooling (DHC) sector

The revision has significantly expanded the definition of efficient district heating and cooling (EDHC) systems, dedicating an entire article to it with specific targets and timelines. The directive introduces two possible definitions for EDHC, the first based on a gradual inclusion of renewable and waste heat sources and the second on a decreasing CO₂ content per kWh.

The first definition is the default option, however, MSs had the flexibility to opt for the EDHC definition based on greenhouse gas (GHG) emissions per unit of heat or cold over specific periods outlined in the article, provided they notified the European Commission by January 11, 2024, for the initial period and at least six months before the start of subsequent periods.

From January 2025, operators of all existing DHC systems not complying with the EDHC definition with a total heat and cold output exceeding 5 MW will be required to develop plans that outline how the definition will be met.



EDHC definition based on CO2 reduction (Source: Euroheat & Power)

While there is no legislative requirement for DHC systems to align with the EDHC definition, DHC systems will only be eligible for financial support if already aligned with the definition or if the funding is intended to meet the EDHC requirements.

The establishment of the EDHC definition sets a clear and ambitious pathway for the DHC sector towards achieving net-zero emissions by 2050, recognising the

DHC solution as key in EU's decarbonisation endeavours. As this involves the gradual integration of renewable and waste heat sources or a reduction in CO2 content per kWh, it will encourage greater use of these sources and offer better flexibility to adapt to specific local contexts.

However, this measure may present some challenges. The increased mandatory share of RES and waste heat in the definition lacks gradual transition and may lead to disparities between member states, necessitating a discussion on the appropriate methodology. This could potentially result in different developments in Member States.

The specification for DHC systems above 5 MW excludes other systems below this threshold from the efficiency improvement requirements. As such, systems below this threshold might not face the same level of scrutiny which may slow down the green transition process.

Tapping into the high potential of waste heat

Finally, the revised EED brings about positive changes and additions by recognising waste heat as a valuable resource in decarbonisation efforts. Besides considering waste heat equally with renewable sources in the EDHC definition, it mandates that data centers with a total rated energy input exceeding 1 MW must employ waste heat recovery applications unless proven economically or technically unfeasible.

Moreover, level cost-benefit analysis has to be carried out on the economic feasibility of increasing the energy efficiency of the heat and cooling supply, where installations above a specific annual total energy input such as thermal electricity generation facilities (>10 MW), industrial installations (>8 MW), service facilities (>7 MW) and data centres (>1 MW) are newly planned or substantially refurbished, which may further lead to a higher utilisation of waste heat on- and off-site and further improvements of heating and cooling efficiency.

However, this may inadvertently exclude smaller setups from benefiting from such improvements. The expanded exemptions from obligatory cost-benefit analyses included in the text could also potentially overlook energy efficiency improvements in certain installations. Exemptions based on specific operating hours or proximity to geological storage might lead to missed opportunities for harnessing significant waste heat recovery potential.

To address these challenges, the European Commission should offer clear guidance and assistance to Member States in unlocking waste heat potential. In return, Member States should eliminate barriers to waste heat utilisation and provide support for its integration into newly constructed or renovated installations.

In summary, the Energy Efficiency Directive (EED) holds significant potential to assist Member States in establishing the requisite legislative and support structures to foster the decarbonisation of the heating and cooling sector and attain the 2030 targets, steering towards carbon neutrality by 2050. Nonetheless, it is necessary to remain cautious regarding the room for maneuver Member States possess when transposing the text into national law. The design and implementation of targeted technical and financial support mechanisms will be essential for facilitating the adoption and execution of these measures.