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Mapping of EU legal and policy framework for DH sector

AGREEMENT #: 83491056

PROJECT: Reform of the Ukrainian district heating sector (ReWarm)/

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CONTEXT:

In April 2023, Germany and Ukraine launched the ReWarm project under the auspices of the German Federal Ministry for Economic Affairs and Climate Action (BMWK), implemented by GIZ in partnership with the Ministry for Communities, Territories and Infrastructure Development of Ukraine. The initiative supports reform of Ukraine's district heating sector through strategic measures, including development of a national district heating strategy, adaptation of legal frameworks, sustainable business models, and cost-reflective socially compensated tariffs

In close collaboration with the State Agency for Energy Efficiency and Energy Saving of Ukraine (SAEE), a team of experts conducted a detailed analysis of the structure and content of EU legal and policy frameworks relevant to district heating. The analysis methodology and resulting mapping table were reviewed and approved by SAEE, ensuring alignment with Ukraine's institutional support needs.

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INTRODUCTION:

The EU legal and policy framework for district heating and cooling (DH/C) aims to decarbonise the heating and cooling sector through comprehensive governance—from high-level strategic directions to binding directives that promote efficiency, renewables, waste heat integration, and demand-side management.

Key strategies and directives include:

- ✓ The EU 2050 climate neutrality strategy, aligned with the Fit for 55 package, targeting net-zero emissions by 2050 and at least a 55% reduction in greenhouse gas emissions by 2030
- ✓ Renewable Energy Directive recast (RED III, Directive EU 2023/2413), strengthening binding targets in heating & cooling (H&C) and DH/C, enhancing definitions on waste heat and cold, and supporting renewable heat integration
- ✓ Energy Efficiency Directive recast (EED, EU/2023/1791), published September 2023, establishing “energy efficiency first” as a legal principle and imposing new obligations for audits, metering, local planning, and DH/C system performance standards
- ✓ Energy Performance of Buildings Directive (EPBD 2024/1275), adopted April 2024, setting standards for zero-emission buildings (ZEB), minimum performance standards, smart-readiness indicators, and solar deployment in buildings, with explicit recognition of efficient DH/C systems.

The findings indicate that EU norms and policies are fundamentally focused on implementing three core pillars of the European strategy for district heating and cooling system development:

1. Demand-side management -
2. Development of renewables &waste heat(cold)& cogeneration-
3. Decarbonisation of district heating and cooling systems -

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MAPPING OF EU LEGAL AND POLICY FRAMEWORK FOR DH SECTOR

EU Framework / Directive	Targets/Key Article(s) / Policy	Implications for DH Sector	Core Pillars
EU 2050 Strategy	Net-zero by 2050 Fit-for-55 target (-55 % GHG by 2030) Deep fuel switching	Frames long-term DH decarbonisation via renewables, efficiency, electrification, waste-heat recovery.	
EU 2016 Heating & Cooling Strategy	**Facilitate building renovation** – tackle building waste, boost renovation rates (<1 %/yr).	Reduces heat demand, necessity for efficient DH networks	
	Integrate heating/cooling with the electricity system– enable flexibility, smart grids.	Smart DH infrastructures can provide grid flexibility via heat storage and demand response	
	Reuse waste heat/cold from industry – map industrial heat, feed into DH networks.	Industrial waste heat should feed into nearby DH networks	
	Engage consumers and industry – promote awareness, smart controls	Awareness, energy labelling, customer choice, demand-side management in DH	
RED III (EU/2023/2413)	**Guidance & Definitions – Waste Heat & Waste Cold** **Content**: Clarifies the definition of waste heat/cold (Article 2(9) RED): must be “unavoidable,” a by-product, generated in industrial/power or tertiary sector, and would be dissipated	Establishes clear criteria for when industrial or residual heat qualifies as “waste heat” eligible for counting.	

EU Framework / Directive	Targets/Key Article(s) / Policy	Implications for DH Sector	Core Pillars
RED III (EU/2023/2413)	without a DH system. Guidance interprets its use under Articles 15a, 22a, 23, 24.		
	Article 15a – Minimum share of renewables in buildings **Content**: Member States should promote renewable energy in buildings up to ~49 % by 2030 (onsite, nearby, grid-based), including district heating-sourced renewables and waste heat. Encourages local authorities to support energy communities via public procurement.	DH systems supplying buildings must integrate increasing shares of renewables (e.g. waste heat, heat pumps, solar thermal).	
	Article 22a – Renewable Energy in Industry **Content**: Introduces an **indicative growth target of 1.6 pp/year** in renewables and allows waste heat from *efficient DH systems* to count toward industry targets. Upper limits waived when heat delivered from district heat sources.	Validates waste heat from DH systems as counted toward broader industry decarbonisation quotas.	
	Article 23 – Heating & Cooling Sector Targets **Content**: Establishes binding targets for renewable energy use in heating and cooling by 2030, expressed in gross final energy consumption; includes waste heat and renewable electricity (efficiency >100%) as eligible contributions. Member States must conduct sectoral assessments on potential use of renewables and waste heat in their H&C sector. To achieve the average annual increase Member States shall endeavour to implement at least two of the following measures:	Enables DH systems to incorporate waste heat and renewable electricity (e.g., heat pumps) into the renewable share calculation; requires strategic planning for DH decarbonisation.	

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RED III (EU/2023/2413)	recast of Article 23, paragraph 4, Member States should implement **at least two** of the following: 1. **Promotion of renewables-based district heating and cooling networks**, in particular via renewable energy communities (RECs), including support through regulatory, financial and cooperative frameworks. 2. **Incentives for renewable heat installations** in buildings (e.g. solar thermal, biomass boilers, heat pumps). 3. **Support for waste-heat and waste-cold recovery**, linking industrial waste heat to district heating networks. 4. **Facilitation of heat pumps and hybrid systems**, including thermal storage integration. 5. **Encourage conversion from fossil-fuel boilers to renewable-based systems** through public procurement. 6. **Support for renewable energy communities (RECs)** engaged in heating & cooling. 7. **Use of guarantees of origin** for renewable heat and thermal energy. 1. **Improving transparency** of district heating system performance and renewable share information to consumers.		

EU Framework / Directive	Targets/Key Article(s) / Policy	Implications for DH Sector	Core Pillars
	2. **Education and consumer information campaigns** to empower vulnerable or low-income households. 3. **Integration of heating and cooling in energy system flexibility services**, e.g. participation in demand response, grid balancing. 4. **Smart metering and controls** in district heating networks for efficiency. **Energy-efficiency-first assessments** in planning heating & cooling projects.		
	Article 24 – Annual indicative increase in renewables in H&C **Content**: Sets an *indicative annual increase* of **2.2 percentage points** (2021–2030) in renewable energy and waste heat share for district heating/cooling. Requires Member States to encourage DH operators to connect third-party suppliers of renewable or waste heat	Strong emphasis on integrating additional renewables and waste heat into DH networks; promotes market opening to external suppliers.	
EED	**Articles 1–2 – Framework & General Duties** **Content:** Establish the Directive's objectives: collective binding EU target of ~11.7% additional final energy savings by 2030 relative to 2020 reference scenario; obligations for public sector energy reduction; extension of energy audit obligations to more enterprises & definition of efficient district heating and cooling that	Sets the broader context for energy demand reduction and energy efficiency across sectors, encouraging demand-side solutions and heating demand reduction—thus affecting overall thermal energy demand that DH must serve efficiently.	

EU Framework / Directive	Targets/Key Article(s) / Policy	Implications for DH Sector	Core Pillars
(revised 2023)	means a district heating or cooling system meeting the criteria laid down in Article 26.		
	Article 3 – Energy Efficiency First (EE1st) **Content:** Establishes EE1st principle applied across all planning, policy and investment decisions, requiring cost-benefit analysis including systemic and life-cycle perspectives; addresses energy poverty explicitly. Makes EE1st a legal obligation. Requires Member States to assess demand-side and system flexibility measures before supply-side investments, to apply cost-benefit methodologies, monitor implementation, and report in NECPs.	Requires prioritisation of energy efficiency before adding supply capacity; favors demand reduction, system optimisation, and flexibility provided by DH (e.g. via heat storage, smart controls).	
	Article 9 - Energy Efficiency Obligation Schemes **Content:** Member States using obligation schemes must require designated energy actors (e.g. suppliers, network operators) to deliver **cumulative end-use energy savings** annually, including among vulnerable groups. Obligated parties may implement measures directly or via certified third parties, and savings must be verifiable and reported annually.	Energy suppliers/distributors obligated under the scheme can **invest in district heating energy efficiency** (e.g. pipe upgrades, building retrofits, smart controls), especially for vulnerable groups. This can serve as a financing mechanism to improve DH efficiency and reduce customer bills.	
	Article 11 - **Energy management systems and energy audits** **Content:** Obliges enterprises with large energy consumption (over 85 TJ annually) to implement a certified energy management system (EnMS) by 11 October 2027, while	Most large municipal DH companies exceed these thresholds, so EnMS/audits will uncover heat-loss “hot-spots”, favour waste-heat recovery, smart pumping, low-temperature	

EU Framework / Directive	Targets/Key Article(s) / Policy	Implications for DH Sector	Core Pillars
EED (revised 2023)	enterprises consuming more than 10 TJ/year must undergo audits by 11 October 2026 and repeat them every four years. Member States may require an assessment of the technical and economic feasibility of connection to an existing or planned district heating or cooling network to be part of the energy audit.	upgrades and other measures that cut fuel use before adding new capacity. These obligations ensure systematic identification and implementation of energy-saving measures—such as waste-heat integration or heat pump adoption—within district heating operators or industrial heat suppliers, thereby supporting optimisation of thermal efficiency across the DH value chain.	
	Article 14- Metering for heating, cooling and domestic hot water **Content:** Member States shall ensure that, for district heating, district cooling and domestic hot water, final customers are provided with competitively priced meters that accurately reflect their actual energy consumption.	Accurate building meters make heat demand transparent, let operators bill on real use and expose network losses—driving both consumers and DH utilities toward efficiency	
	Article 15 – Sub-metering & cost allocation for heating, cooling & DHW **Content:** In multi-apartment or multi-purpose buildings fed by DH/DHC, individual unit meters or cost allocators must be installed where technically feasible and cost-effective; Member States must set transparent rules for allocating energy costs in those buildings	Unit-level feedback typically cuts final heat use 15-25 %; fair cost-allocation also reduces “free-rider” behaviour and stabilises DH revenues	

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EED (revised 2023)	**Article 25 – Heating & Cooling Planning** **Content:** Member States must ensure that **municipalities with populations over 45,000** develop **local Heating & Cooling Plans**, aligned with national energy strategies. Key obligations include: a. **Mapping and estimating potential** for energy efficiency, waste heat recovery, renewable heating, high-efficiency cogeneration, and low-temperature DH readiness. b. Ensure compliance with the **Energy Efficiency First (EE1st)** principle. c. Include **strategies** to exploit identified potential. d. Develop plans in participation with local stakeholders, general public, and infrastructure operators. e. Account for existing local energy infrastructure. f. Coordinate across neighboring administrative units for joint investments. g. Evaluate involvement of **energy communities** and consumer-led initiatives. h. Analyze appliance/system stock and address worst-performing buildings and vulnerable households. i. Assess financing mechanisms enabling shift to renewable heating. j. Set progressive trajectories aligned with climate neutrality, and define monitoring indicators. k. Phase out inefficient heating/cooling appliances in public	Supports integrated spatial planning of DH networks, demand-side measures, and alignment with local energy needs and technology options.	

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EED (revised 2023)	buildings, prioritizing high-efficiency alternatives. l. Evaluate synergies with neighboring plans for joint implementation. Member States must support municipalities with technical and financial resources.		
	Article 26 - Efficient District Heating & Cooling (DH&C) **Content:** Defines the criteria for a DH&C system to qualify as **efficient**, with progressive thresholds: **By 31 Dec 2027**: ≥ 50% renewable energy or waste heat or 75% cogenerated heat (or ≥ 50% combination). From **2028**: ≥ 50% renewable + waste heat OR 80% high-efficiency cogeneration (with ≥ 5% renewable baseline). From **2035**: total ≥ 80% combination, with at least 35% renewable or waste heat. From **2040–2045**: steepening requirements up to **100% renewables & waste heat by 2050**. Alternatively, Member States may adopt **GHG emission thresholds**: starting at 200 gCO_2/kWh in 2025, declining to 0 g/kWh by 2050	Establishes a clear **decarbonisation pathway** and minimal performance baseline for DH&C. It mandates system transformation—via renewables integration, waste heat recovery, cogeneration, network efficiency upgrades—and guides operators in infrastructure refurbishment and fuel-switch planning.	
	Article 30 - National Energy Efficiency Fund & Financing	Article 30 enables and encourages **public-private financing instruments** targeted to modernise and decarbonise DH systems:	

EU Framework / Directive	Targets/Key Article(s) / Policy	Implications for DH Sector	Core Pillars
	Content: Member States must facilitate financing facilities—public or existing—for energy efficiency improvements, especially including for district heating and cooling refurbishments. This includes green loans, on-bill/on-tax financing, grants, technical assistance, and optional creation of a national energy efficiency fund, possibly fueled by EU ETS revenues. The Commission will support via guidance, best-practice exchange, and private capital mobilisation	network upgrades, high-efficiency cogeneration retrofits, renewable integration, and support for low-income or energy-poor consumers within DH territories.	
EPBD 2024/1275	**Articles 1 – 2 - Subject Matter & Scope&Definitions** **Content:** Establishes the goal of achieving a zero-emission building stock by 2050, reducing greenhouse gas emissions and boosting energy performance, including via efficient DH&C systems. Defines **district heating' or 'district cooling' -** the distribution of thermal energy in the form of steam, hot water or chilled liquids, from a central or decentralised source of production through a network to multiple buildings or sites, for the use of space or process heating or cooling.	Recognises DH networks as key tools for reducing emissions in buildings—and mandates that buildings' heating systems align with the decarbonisation objectives.	
	Article 9 – Minimum Energy Performance Standards (MEPS) **Content:** Requires Member States to set MEPS for existing non-residential buildings, focusing initially on the worst-performing segments by 2030/2033. MEPS also covers building systems including heating.	Retrofitting buildings to meet MEPS often necessitates switching to efficient DH networks or low-temperature DH solutions—especially in public and large buildings.	

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EPBD 2024/1275	**Article 10 – Solar Energy in Buildings** **Content:** Mandatory installation of solar PV/thermal on the roofs of public buildings (≥2000 m² by 2027, scaled to ≥250 m² by 2030) or when roofs are renovated. Encourages integration of solar systems with DH networks.	Promotes **on-site solar thermal or PV–heat coupling** feeding into local DH systems, maximizing renewable supply for building heating.	
	Article 11 – Zero Emission Buildings (ZEB) **Content:** From 2028, all new public buildings—and from 2030, all new buildings—must meet zero-emission building (ZEB) standards: no onsite fossil-fuel emissions and high energy performance. Life-cycle GWP must be calculated and disclosed. Efficient DH&C integration counts toward ZEB compliance.	Buildings connected to **efficient DH systems** (as defined in EED Article 26) can use that connection to achieve ZEB status, promoting thermal networks as compliant low-carbon solutions.	
	Article 13 – Technical Building Systems **Content:** Member States must define minimum system standards for technical building systems—including installation, dimensioning, adjustment, control, and, where feasible, hydraulic balancing in new and renovated buildings. Buildings must meet cost-optimal energy performance levels. Requirements can include GHG limits, fuel type restrictions, and mandated shares of renewable-based heating, provided they don't create unjustified market barriers. Also encourages phase-out of fossil fuel standalone boilers by 2040 and promotion of energy storage and control system deployment.	These provisions support the uptake of **low-temperature heating systems**, smart controls, and hydronic balancing—critical for optimizing building integration with **district heating networks**. They encourage system upgrades that reduce heat demand and improve end-user efficiency, making buildings better suited for connection to efficient DH systems.	

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EPBD 2024/1275	**Article 15 – Smart Readiness of Buildings** **Content:**The Commission is tasked with adopting delegated and implementing acts to establish an optional common EU Smart Readiness Indicator (SRI) scheme, as per Annex IV. This rating assesses a building's capacity to adapt operations to occupant needs, indoor environment quality, and grid flexibility, enhancing energy performance. By 30 June 2027, the SRI will become mandatory for non-residential buildings with heating/ventilation systems over 290 kW.	Buildings with high SRI scores are likely integrated with **smart DH systems** (e.g. demand-response, heat pumps, smart controls). The SRI promotes connection to efficient DH&C networks that support grid flexibility and renewable energy use.	
	Article 16 – Data Exchange **Content:** Under Article 16, Member States must ensure building owners, tenants, and managers have direct access to their building systems' data (e.g. energy performance, system lifespan, meters, automation systems, EV charging points), with opt-in access for third parties. Full interoperability and transparency are required, with no extra cost to users.	Access to static and dynamic building data helps map heat demand, detect inefficiencies, target buildings for DH network connection, and enable smart building services like demand-response that interact with DH systems.	
	Articles 23 - 24 – Inspection Reports of Heating, Ventilation & AC Systems **Content:** Every inspection of systems >70 kW (or >290 kW for more frequent intervals) must result in a written inspection report based on Article 23 criteria. It must include cost-effective recommendations for improving performance (including reducing fossil fuel use) and highlight any safety issues. Reports are	Inspection reports for large boiler or chiller systems connected to district heating networks provide documented opportunities to connect to **efficient DH systems**, install smart controls, or improve hydraulic balancing—all visible in national records and enabling regulatory oversight.	

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EPBD 2024/1275	handed to the owner and uploaded into the national building performance database.		
	Article 25 – Independent Experts **Content:** Mandates that EPCs, renovation passports, smart readiness indicators, and system inspections are performed by independent, certified experts, operating either privately or publicly; states must maintain public lists of certified professionals and training access.	Ensures that individuals assessing heating systems and building performance **accurately document DH connectivity and system characteristics**, enabling consistent recommendations, reliable data for network planning, and real insight into building-DH system synergy.	
	Article 27 – Independent Control System for EPCs, Renovation Passports, SRI & Inspection Reports **Content:** Member States must establish independent quality control systems for Energy Performance Certificates (EPCs), Renovation Passports, Smart Readiness Indicators, and inspection reports of heating, ventilation and air conditioning systems—all in line with the minimum requirements in Annex VI. These documents must be made available to competent authorities upon request.	Controls ensure accuracy and integrity of data on a building's heating performance—including whether it is connected to an efficient district heating/cooling system—thus ensuring that DH benefits are correctly reflected in EPCs or renovation documents.	