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Comparative Gap Analysis Report
(UA–EU legislation in DH-sector)

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PROJECT: Reform of District Heating Sector in Ukraine (ReWarm)

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Table of Contents

Introduction

The German-Ukrainian cooperation under the project for reforming Ukraine's district heating sector ("ReWarm") was launched in April 2023 between the Federal Ministry for Economic Affairs and Climate Action of Germany (BMWK) and the Government of Ukraine. The project aims to reform municipal district heating systems.

ReWarm focuses on improving the legislative, regulatory, and financial framework for the sustainable reform of the district heating sector (hereinafter — the DH sector), fostering the economic consolidation of heating utilities, and attracting investments in energy efficiency.

For the successful implementation of the project, strategic alignment with national institutions is crucial. In this context, the State Energy Efficiency Agency of Ukraine (SAEE), as ReWarm's strategic partner, requested the initiation of a comprehensive study — to assess the degree of alignment of Ukrainian legislation with EU requirements in the field of district heating. The purpose of this analysis is to identify existing gaps, outline harmonization steps, and support the development of evidence-based legislative and regulatory proposals for Ukraine's integration into the European energy space.

Within this assignment, a group of experts prepared a Comparative Analysis Report examining the legislation of Ukraine and the EU in the fields of district heating and energy efficiency. The report assesses the level of consistency between national strategies, laws, and programs and the requirements of key European instruments (EED, EPBD, RED directives, and EU policy targets).

In particular, the experts analyzed the National Energy and Climate Plan (NECP), the State Program for Modernization of the Heating Supply Sector, and relevant Ukrainian legislation (laws on energy efficiency, district heating, and metering of thermal energy, among others), comparing them with the provisions of the new EU directives.

Following consultations with SAEE, a detailed report was prepared identifying the main gaps and recommendations. The draft document was presented to SAEE and received no critical comments. The report includes a concise overview of the current situation (introduction), as well as structured analytical sections and conclusions on the following thematic areas: strategic documents (NECP and state programs), the Energy Efficiency Directive (EED), the Energy Performance of Buildings Directive (EPBD), and the Renewable Energy Directive (RED). Each section contains a summary, identified gaps, and recommendations for harmonizing Ukrainian regulations with the European framework.

I. Analysis of the Compliance of National Strategic Documents in the District Heating Sector with EU Strategies and Policies

Alignment with the EU 2050 Strategy and the "Fit for 55" Package

The EU 2050 Strategy envisions achieving climate neutrality (net-zero greenhouse gas emissions) by 2050. This implies a near-complete phase-out of fossil fuels in all sectors, including heating. To this end, the EU adopted the European Climate Law (2021), which legally commits Member States to reach net-zero emissions by 2050 and sets an intermediate target — at least a 55% reduction in GHG emissions by 2030 compared to 1990 levels.

The "Fit for 55" legislative package (2021–2023) comprises updated directives and regulations designed to align the EU's energy system with these targets. In terms of renewable energy, *Fit for 55* increased the EU-wide renewable energy target for 2030 to 42.5% of gross final energy consumption (up from the previous 32%). Member States must update their National Energy and Climate Plans (NECPs) to collectively achieve 42.5% renewables by 2030, while striving for a non-binding benchmark of 45%.

For the heating and cooling sector, *Fit for 55* established subsectoral targets — an average annual increase of ~1.1 percentage points in renewable energy and 2.2 percentage points for district heating and cooling systems, recognizing that heating accounts for approximately 50% of the EU's final energy demand, of which around 91% still relies on fossil fuels. In other words, without a substantial increase in "green" heat, the EU will not achieve its 42.5% renewables target or its climate neutrality objective.

Ukraine has declared targets that are comparable in structure but less ambitious in terms of renewables. According to its Updated Nationally Determined Contribution (NDC2) and the NECP, Ukraine aims to reduce greenhouse gas emissions by 65% of 1990 levels by 2030, exceeding the EU's 55% reduction target. However, this reduction primarily results from structural changes in the economy and declining energy intensity rather than from large-scale renewable deployment.

Regarding renewable energy, the NECP-2030 sets a target of 27% renewables in final energy consumption, significantly lower than the EU's 42.5%. As of 2020, renewables accounted for about 13% in Ukraine compared to 22% in the EU.

In the heating sector, Ukraine targets 33% renewables in district heating by 2030 — slightly below the projected EU average (~40% by 2030, given a required growth rate of ~1.8% per year from a 2020 baseline of ~23%). However, achieving 33% in Ukraine will be challenging, as the baseline is very low: according to the National Renewable Energy Action Plan, renewables accounted for only 7–8% of heating energy in 2020 (mainly biomass in district heating and private sectors). Thus, Ukraine would need to more than triple this share within a decade — a pace comparable to RED III's requirements.

In summary, at the strategic level, Ukraine's intentions are aligned with the EU's decarbonization trajectory, but its formal quantitative targets for renewables are more modest. The main challenge lies in implementation: EU targets are enshrined in directives with binding effect, whereas Ukraine's are mostly declarative. There are no legally binding instruments to guarantee the achievement of 27% or 33% renewables. As reflected in the comparative analysis, Ukraine's heating sector remains insufficiently integrated into climate policy, despite the NECP and decarbonization commitments. The sector is still not fully viewed as an instrument of climate strategy, and there are no renewable or CO_2 benchmarks for municipal heating utilities.

***Fit for 55* also encompasses related policy areas affecting the heating sector:**

- Stricter building energy efficiency standards. The updated EPBD requires all new buildings from 2030 onwards to be zero-emission buildings (ZEB) and existing ones to undergo staged renovations to higher efficiency classes. This will reduce heat demand and phase out individual gas boilers in favor of heat pumps, efficient networks, or other renewable systems. In Ukraine, NZEB standards for new constructions are set to apply from 2025 but remain less stringent, and the phase-out of gas boilers is still under discussion.

• Development of renewable gases (biomethane, hydrogen). Under *Fit for 55*, renewable gases can contribute to decarbonizing heating if used in boilers or CHP plants. Ukraine has made progress by launching the biomethane guarantees of origin registry, yet the integration of hydrogen into heating remains a long-term prospect.

Hence, the European framework dictates that Ukraine's share of renewables in heat must also grow steadily, while natural gas combustion should decline to nearly zero by 2050. To achieve this, Ukraine needs to transform its current "paper-based" NECP targets into enforceable mechanisms through new legislative and regulatory acts — as elaborated in the comparative analysis.

Correlation with the National Energy and Climate Plan (NECP) up to 2030

The National Energy and Climate Plan of Ukraine up to 2030 (NECP), approved by the Government in June 2024, is an integrated strategic document aligned with the structure of EU Member States' plans. It defines national targets across the five dimensions of the EU Energy Union: decarbonization (emissions and renewables), energy efficiency, energy security, internal energy market, and innovation.

For the renewable heat sector, key NECP provisions include:

• Renewable energy target: confirmation of the general goal of 27% renewables in gross final energy consumption by 2030, harmonized with the Energy Community. Sector-specific targets are detailed in the National Renewable Energy Action Plan (NREAP-2030): 33% in heating and cooling, 29% in electricity, and 17% in transport. Thus, the NECP recognizes that the heating sector must achieve the highest renewable share among all energy sectors by 2030, consistent with RED III principles emphasizing heating and cooling as priority areas due to their large substitution potential (biomass, heat pumps, solar collectors, etc.).

• Measures to achieve targets: the NECP lists a set of policies and measures closely aligned with RED III requirements, including:

✓ District heating reform — harmonizing legislation with the EU's Third Energy Package (creating a competitive heat market, regulating network access, promoting CHP and renewables). This entails the introduction of non-discriminatory third-party access, improvement of boiler efficiency, and modernization of distribution networks.
✓ Bioenergy development — an approved Renewable Energy Action Plan envisages expanding biomass and biogas production for heating. A framework for a biomethane market has been established, and the 90% tariff incentive for bioheat remains active.
✓ Energy efficiency in buildings — NECP includes measures for large-scale thermal modernization of residential buildings, reducing heat consumption and facilitating a higher share of renewables in relative terms. This effort is supported by the Energy Efficiency Fund.
✓ Decentralized generation — the plan emphasizes small-scale distributed heat generation, such as local biomass boilers and heat pumps for municipalities, aligning with the EU's renewable energy communities concept and local investment mobilization.
✓ Integration into European markets — though primarily relevant to electricity and gas, Ukraine's integration into the European energy space also includes convergence of heating standards (efficiency, sustainability). The NECP explicitly declares the intention to adopt the EU's Green Deal principles and integrate its mechanisms into national policy.

The NECP's compliance with EU directives can be summarized as follows: At the target level, the plan mirrors the European direction — acknowledging the need for a rapid increase in renewable heat. However, at the instrumental level, the NECP lacks the specificity of RED III. For example, while RED III mandates third-party network access, annual renewable increases, and consumer information obligations, the NECP only states intentions such as "to create enabling conditions" or "to adapt legislation."

On October 2, 2025, the Government of Ukraine approved the State Target Program for Energy Modernization of District Heating Enterprises until 2030, developed by the Ministry for Communities, Territories and Infrastructure Development in accordance with the Final Provisions of the Law of Ukraine "On Energy Efficiency."

Criterion / Area	State Target Program for Energy Modernization of District Heating Enterprises of Ukraine until 2030	EU Heating & Cooling Strategy / RED III / Fit for 55	Compliance and Comments
Strategic Objective	Reduction of natural gas consumption, increase of energy efficiency and reliability of heat supply.	Full decarbonization of the heating and cooling sector by 2050; interim goal – at least 50% renewable heat by 2030.	Partial compliance. The Ukrainian program focuses on energy efficiency and supply security but lacks clear climate-oriented benchmarks.
Target Indicators	Reduction of heat losses in networks by 20%; reduction of specific fuel consumption by 15%; substitution of up to 30% of gas with alternative sources.	Annual increase of the renewable share in heating by 0.8–1.1 percentage points; in district heating systems by 2.2 p.p. per year; progressive increase to 100% renewable heat by 2050.	Insufficient ambition. No annual quotas or mechanisms ensuring the achievement of targets.
Principle “Energy Efficiency First” (EE1st)	Declared as a goal but not established as a binding criterion for investment decisions.	A legally binding principle for all sectors; requires mandatory assessment of demand-side options.	Requires implementation. Currently remains declarative.
Technological Modernization	Reconstruction of boiler houses, replacement of pipelines, introduction of individual heat substations (IHS), partial use of biomass.	Transition to 4th-generation district heating: low-temperature networks, heat pumps, power-to-heat technologies, thermal storage, and digital management.	Needs modernization. Predominantly focuses on classical upgrades without shifting to next-generation technologies.
IHS and Metering	Gradual introduction of IHS in residential and public buildings by 2030; individual apartment metering not mandatory.	IHS are mandatory; individual apartment metering and remote data reading are standard.	Partial compliance. IHS and apartment-level metering must become legally binding.
Renewables and Cogeneration	Promotion of biomass, biogas, and cogeneration; no mandatory renewable share thresholds.	Binding renewable growth rates, including waste heat utilization and high-efficiency cogeneration; efficiency criteria for systems.	Needs quantitative obligations and a monitoring framework for renewable shares.
Integration with the Power Grid	Not envisaged.	Mandatory assessment of power-to-heat potential, grid synergies, and thermal storage.	Absent requirement – potential area for harmonization.
Market Openness (Third Party Access, TPA)	Not regulated; heat networks remain municipal monopolies.	Open access for independent producers to networks; competition among “green heat” suppliers.	Non-compliant. No mechanism for non-discriminatory network access.
Financial Mechanisms	Budgetary financing, donor support, international credit lines;	Multi-instrumental support through InvestEU, Horizon,	Partial compliance. A stable national financing mechanism for district

	no stable modernization fund.	Cohesion Funds, and national renewable funds.	heating projects is required.
Social Aspect and Energy Poverty	Addressed via subsidy schemes; not integrated into modernization policy.	Energy poverty mitigation is a component of energy strategies; support for households to connect to efficient district heating.	Non-compliant. The social dimension of modernization is missing.
Institutional Coordination	Responsibilities split among the Ministry of Energy, Ministry for Communities and Infrastructure, SAEE, and local authorities.	Coordinated at the level of the European Commission and national NECPs; mandatory municipal heating & cooling plans.	Partial compliance. Requires a unified coordination system.

Matrix of Gap Analysis of the State Program and EU Strategies and Policies

The Program outlines a comprehensive package of measures aimed at improving the energy efficiency of district heating systems, reducing dependence on natural gas, and ensuring reliable and high-quality heat and hot water supply to consumers.

Within the next five years, the Program provides for:

- development and updating of heat supply schemes for settlements;
- achieving 100% commercial metering of thermal energy in 15,000 buildings
- capital repair and reconstruction of district heating facilities; modernization of 35,000 heat inlets through the installation of individual heat substations (IHS);
- reconstruction and overhaul of 2,500 km of heat networks; modernization and/or connection of heat sources and other related measures.

Narrative Comparative Analysis of the Ukrainian Programme and EU Heating & Cooling Strategies

1. Overall Logic of the Programmes

The European Heating & Cooling Strategy establishes a systemic and integrated approach: modernisation of district heating is viewed as an essential component of the energy transition and the achievement of climate neutrality. Its core principle is *"energy efficiency first"*, combined with mandatory growth in the share of renewable energy sources.

The Ukrainian State Programme for Energy Modernisation of District Heating Enterprises focuses primarily on reducing losses, cutting gas consumption, and enhancing technical reliability. These are necessary but insufficient preconditions for decarbonisation. Its main distinction lies in the absence of a climate framework, concrete annual renewable energy (RES) benchmarks, and mechanisms for progress monitoring.

2. Energy Efficiency and Technological Upgrading

The EU aims to transition to fourth-generation district heating systems (4GDH) — low-temperature networks, heat pumps, recovery of waste heat, power-to-heat conversion, thermal storage, and digitalised management systems.

The Ukrainian Programme largely retains a "traditional reconstruction" approach: replacing boilers and pipelines, installing individual heat substations (IHS), and insulating buildings.

A technological leap is not embedded in the concept; modernisation follows outdated technical standards.

Gap: Absence of regulations promoting temperature reduction in networks, large-scale deployment of heat pumps, or integration with electricity systems.

Recommendation: Supplement the Programme with 4GDH technical standards and introduce incentives for power-to-heat technologies.

3. Renewable Energy, Cogeneration, and Metering

EU policy mandates annual increases in renewable heat production and the share of cogeneration within district heating systems. The Ukrainian Programme only provides for partial gas substitution with alternative sources (up to 30%), without binding commitments or systematic monitoring of the RES share.

Policies for individual regulation and apartment-level metering remain underdeveloped: IHS are treated as recommended, not mandatory, elements.

Recommendations:

- Establish legal obligations for IHS installation and apartment-level heat metering.
- Introduce clear RES-share targets in heat supply, accompanied by monitoring systems and public reporting by utilities.

4. Market Model and Competition

The EU promotes competition among heat producers through *third-party access* (TPA), allowing independent producers of renewable or waste heat to supply it into the system. In Ukraine, municipal operators remain monopolies, and independent producers have limited or no access to heat networks.

Without market and tariff reform, private investment in “green heat” remains constrained. Recommendation: Adopt legislative amendments introducing an open-access mechanism for independent heat producers and a standardised power purchase agreement (PPA) model for heat energy.

5. Financing and Institutional Support

In the EU, district-heating modernisation is financed through a multi-level system of investment funds, concessional loans, grants, and municipal programmes. The Ukrainian Programme relies mainly on state budget resources and donor assistance, without a stable, dedicated investment fund for network modernisation.

Recommendation: Establish a sustainable financial instrument for heat-supply modernisation with permanent funding — via a Decarbonisation Fund, green bonds, or contributions from international partners. Develop targeted programmes for communities with the highest heat losses.

6. Social and Climate Dimension

The European strategy integrates energy poverty alleviation into heat-supply policy, ensuring that modernised, efficient heating remains affordable for vulnerable consumers. In Ukraine, these issues are handled separately — primarily through the subsidy mechanism, not as an integral part of the modernisation agenda. The Ukrainian Programme also lacks explicit climate objectives (CO_2 reduction), whereas in the EU each heat project is evaluated by its carbon impact.

Recommendation: Enrich the Programme with climate indicators (tons of CO_2 reduced, MWh saved) and introduce a social component — grants or compensation schemes for vulnerable consumers during transition to efficient district heating.

7. General Conclusions

The Ukrainian State Programme corresponds to the initial phase of modernisation, focusing on energy efficiency and loss reduction, but it does not yet encompass the decarbonisation trajectory envisaged by the EU Heating & Cooling Strategy.

To achieve full alignment, the Programme should evolve into a comprehensive “District Heating Sector Transformation Programme” integrating renewables, cogeneration, digitalisation, open market mechanisms, and social protection tools. Practically, Ukraine needs to move from “rehabilitation” to “green renewal” — modernising not only technology but also governance, market structures, and strategic objectives.

8. Key Recommendations for Harmonisation

- Integrate a climate objective (CO_2 reduction, increase in RES share) into the State Programme.
- Introduce mandatory annual RES-heat growth targets with a monitoring mechanism.
- Expand the technological focus to include heat pumps, power-to-heat systems, and thermal storage.
- Ensure open network access for private and municipal “green” producers.
- Establish a permanent modernisation fund for district heating aimed at systemic, not pilot, projects.
- Incorporate a social protection dimension — safeguarding vulnerable groups during efficiency upgrades and tariff reforms.

Final Conclusion

The Ukrainian Programme for District Heating Modernisation represents an important step toward sectoral reform but remains energy-efficiency-oriented rather than decarbonisation-driven. To align with the EU Heating & Cooling Strategy, Ukraine must introduce binding climate targets, open the heat market, enhance the role of renewables and cogeneration, and create stable financial mechanisms.

These measures would shift the focus of Ukraine’s heat-supply reform from mere repair to green transformation, ensuring coherence with the European energy transition pathway toward climate neutrality by 2050.

II. Analysis of the Alignment of National Legislation in the District Heating Sector with the Requirements of Directive (EU) 2023/1791 on Energy Efficiency

Directive (EU) 2023/1791 establishes a modern framework for enhancing energy efficiency within the European Union.

It is founded on the “energy efficiency first” principle, defines binding national energy-saving contributions, strengthens the role of the public sector, introduces mandatory energy efficiency obligation schemes, and regulates energy audits, energy management systems, metering requirements, consumer rights, and awareness measures.

Ukraine has adopted a series of laws regulating energy efficiency and the heat and water supply sectors, including:

- the Law “On Energy Efficiency” No. 1818-IX,
- the Law “On Commercial Metering of Thermal Energy and Water Supply” No. 2119-VIII,
- the Law “On Heat Supply” No. 2633-IV,
- the Law “On Energy Efficiency of Buildings”, and
- the Law “On Combined Production of Thermal and Electric Energy (Cogeneration)”, along with a number of related regulatory acts.

A comparative analysis of the articles of Directive (EU) 2023/1791 and the provisions of these laws makes it possible to assess the degree of alignment between Ukrainian and EU legislation and to identify existing regulatory gaps that need to be addressed for full harmonisation.

Comparative Table — Directive (EU) 2023/1791 on Energy Efficiency (EED) vs. Ukrainian Legislation

Directive Article	Ukrainian Legislation	Compliance and Recommendations
Articles 1–2 — Framework and general obligations. Content: Define the Directive’s objectives: a joint, binding EU target of ~11.7% additional final energy savings by 2030 compared with the 2020 baseline; obligations to reduce energy consumption in the public sector; expansion of mandatory energy audits for enterprises; definition of efficient district heating pursuant to Article 26.	Law “On Energy Efficiency” No. 1818-IX; National Energy and Climate Plan (NECP)	Partially compliant. Requires approval, at Cabinet level, of an annual reduction indicator.
Article 3 — Energy Efficiency First (EE1st). Content: Enshrines the EE1st principle, applicable to all planning, policy, and investment decisions, requiring cost-benefit analysis, including system-wide and life-cycle perspectives; explicitly addresses energy poverty. Makes EE1st a legal obligation. Requires Member States to assess demand-side measures and system flexibility before supply-side investments, apply cost-benefit methodologies, monitor implementation, and report within the NECP.	Law “On Energy Efficiency” No. 1818-IX; National Energy and Climate Plan (NECP)	Needs improvement. The principle is only declaratively embedded. It is necessary to make compliance with EE1st a legal obligation. Introduce evaluations in the district heating sector prioritising demand reduction and system flexibility before new capacity investments; apply benefit-analysis methodologies, track implementation, and report.
Article 9 — Energy Efficiency Obligation schemes. Content: Where such schemes are applied, obligated parties (e.g., suppliers, network operators) must achieve annual final energy savings,	—	Needs improvement. The principle is only declaratively stated. A Government-level scheme must be approved.

Directive Article	Ukrainian Legislation	Compliance and Recommendations
including measures for vulnerable groups. Obligations may be delivered directly or via certified third parties; savings must be verified and reported annually.		Energy suppliers or distribution companies may invest in district heating efficiency (e.g., pipe upgrades, building insulation, “smart” control), with particular attention to vulnerable consumers. This is also a financing instrument for DH modernisation and bill reduction.
Article 11 — Energy management systems and energy audits. Content: Obligates enterprises with high energy consumption (>85 TJ/year) to implement a certified energy management system by 11 October 2027; enterprises >10 TJ/year must undergo an energy audit by 11 October 2026 and repeat it every four years.	Law No. 1818-IX “On Energy Efficiency,” Article 10 established requirements for mandatory energy audits.	Compliant. Mandatory audits for large enterprises are envisaged, but the consumption threshold that triggers audits should be lowered.
Article 14 — Metering of heat, cooling, and domestic hot water. Content: Member States shall ensure that, for district heating, district cooling, and DHW, end-users are provided with meters accurately reflecting actual energy use at a competitive price.	Law “On Commercial Metering of Thermal Energy and Water Supply” No. 2119-VIII; Law “On Housing and Communal Services”; draft law “On Amendments to the Law ‘On District Heating’ to Ensure Individual Regulation of Thermal Energy Consumption” (prepared by the Cabinet of Ministers in 2025).	Compliant. Ukrainian legislation aligns with the Directive’s baseline provisions on metering. The new IHS bill strengthens control and automation, going beyond the Directive’s minimum requirements.
Article 15 — Apartment-level metering and cost allocation for space heating, cooling, and DHW. Content: In multi-apartment or multi-purpose buildings connected to DH/DC, individual meters or heat cost allocators shall be installed where technically feasible and economically justified. States must define transparent cost-allocation rules.	The Law on Commercial Metering of Thermal Energy and Water Supply, in particular: Article 3 prohibits connecting buildings to networks without commercial metering units; the operator or owner is obliged to install meters, with costs potentially included in tariffs; compensation for owners who have installed meters at their own expense. Article 4 obliges equipping individual premises with heat and water meters and allocators, defines exemptions, and sets a three-year period for retrofitting. Article 5 requires that new buildings be commissioned only if metering units are installed, and Article 6 regulates their maintenance and replacement.	Needs improvement. It is necessary to introduce binding norms on apartment-level heat metering. Requirements should be deepened and specified to achieve full harmonisation with EU law, in particular regarding apartment-level metering and the use of control devices.
Articles 21–22 — Policies on energy poverty and consumer information. The Directive emphasises equal access to energy-efficiency measures for vulnerable groups and energy-poor households (Art. 21), as well as raising public awareness on energy efficiency through information campaigns and education (Art. 22).	Law No. 1818-IX “On Energy Efficiency,” Article 18: “Promotion and incentivisation of higher levels of energy efficiency among consumers.” This article assigns public authorities the task of motivating consumers to implement energy-efficiency measures through information	Needs improvement. Information activities are stipulated formally but without mandatory national programmes or a consumer-protection focus. Definitions, criteria, and a policy framework

Directive Article	Ukrainian Legislation	Compliance and Recommendations
Examples include creating “expert networks” to support local authorities in tackling energy poverty, offering consumer advice on savings, and developing training programmes.	campaigns, outreach, demonstration projects, etc.	for addressing energy poverty—required by the Directive—are absent. This is a conceptual gap, with responsibilities dispersed between social and energy policy.
Article 25 — Heating and cooling planning. Content: Member States shall ensure that municipalities with populations over 45,000 prepare local heating and cooling plans aligned with national energy strategies. Core obligations include: (1) mapping/assessing potential for energy efficiency, waste heat recovery, renewable heat, cogeneration, and readiness for low-temperature systems; (2) ensuring compliance with the EE1st principle; (3) embedding strategies to realise identified potential; (4) preparing plans with local stakeholders, the public, and infrastructure operators; (5) accounting for existing local energy infrastructure; (6) coordinating with neighbouring jurisdictions for joint investment; (7) assessing the role of energy communities and consumer-centric initiatives; (8) analysing existing equipment/systems and addressing worst-performing buildings and vulnerable households; (9) evaluating finance mechanisms for the renewable-heat transition; (10) setting progressive trajectories aligned with climate neutrality and defining monitoring indicators; (11) decommissioning inefficient equipment in public buildings with priority for high-efficiency alternatives; (12) assessing synergies with neighbouring plans for joint delivery. States must provide technical and financial support to municipalities.	Law “On Energy Efficiency” No. 1818-IX; Law of Ukraine “On District Heating”; Methodology for District Heating Schemes (Order of the Ministry for Communities and Territories Development No. 235 of 02.10.2020) establishes the planning framework and mandates the development and approval of district heating schemes and municipal energy plans.	Partially compliant To reach full compliance with Article 25, Ukraine should: Legally embed the EE1st principle in local planning procedures; Mandate GIS-based mapping of RES and waste-heat potential; Introduce obligatory public consultation and cross-municipal coordination mechanisms; Define standardized indicators, monitoring, and reporting; and Incorporate financial, social, and community-energy dimensions into both
Article 26 — Efficient district heating and cooling. Content: Sets criteria under which a district heating/cooling system is deemed efficient. Progressive thresholds: by 31 December 2027: at least 50% renewable energy or waste heat, or 75% cogenerated heat (or ≥50% in combination); from 2028: ≥50% renewable + waste heat or ≥80% high-efficiency cogeneration (with a baseline ≥5% renewable); from 2035: ≥80% in total combination, of which at least 35% must be renewable or waste heat; 2040–2045: progressive increase to reach 100% renewable and waste heat by 2050. Alternatively, Member States may apply GHG-emissions thresholds: starting at 200 g CO_2/kWh in 2025, progressively declining to 0 g/kWh by 2050.	Law No. 1818-IX “On Energy Efficiency” introduced the definition of “efficient district heating,” mirroring the Directive (a system using ≥50% renewable energy, or ≥50% waste heat, or ≥75% cogenerated heat, or ≥50% of such sources in combination). In 2023, Law No. 2957-IX on the development of high-efficiency cogeneration was adopted, implementing EU qualification criteria for CHP units and guarantees of origin for electricity produced by cogeneration. Article 11 of the Law “On District Heating” obliges local self-government to develop municipal district heating schemes. Order No. 235 (2020) approved the Methodology for DH schemes,	Needs improvement in line with the new EU monitoring and regulatory thresholds.

Directive Article	Ukrainian Legislation	Compliance and Recommendations
	including a section on assessing efficient DH and cogeneration potential based on cost-benefit analysis.	
Article 28 — Qualifications, accreditation, and certification of professionals. Requires accessible schemes for certification/accreditation or equivalent training for energy-efficiency professionals—ESCOs, energy auditors, energy managers, installers of building energy-efficiency components, etc. The State must accredit certification bodies.	Law No. 1818-IX "On Energy Efficiency," Article 11: "Energy auditors." Establishes a professional energy-auditor institution: individuals must be certified (qualification certificate) to perform energy audits. Qualification requirements and the certification procedure are set by the authorised body (State Agency on Energy Efficiency) in coordination with the Ministry of Education and Science, reflecting European standards; the procedure was approved by Cabinet Resolution No. 843 (2021).	Compliant.
Article 29 — Energy services (ESCO) and the energy-efficiency market. Obligates States to develop the ESCO market: publish standard ESCO contracts with required clauses (per Annex XV); create and maintain an official register of qualified energy-service providers; ensure a point of contact for information on services, finance, and M&V methods; promote quality (e.g., voluntary ESCO labels/standards). Public authorities must consider ESCO models for refurbishing large buildings (>750 m²). States should also remove accounting/legal barriers and enable independent dispute resolution (ombudsman).	Law No. 1818-IX "On Energy Efficiency," Article 17: "Energy service." Recognises that energy-efficiency measures may be implemented via ESCO contracts in both the public and private sectors. Refers to the special Law No. 327-VIII "On Introducing New Investment Opportunities… for Large-Scale Energy Modernisation" (2015), which regulates ESCO contracting with budgetary institutions.	Compliant.
Article 30 — National energy efficiency fund and financing. Content: Member States shall facilitate financial mechanisms—public or existing—to implement energy-efficiency measures, including the modernisation of district heating/cooling systems. Such mechanisms include green loans, on-bill or tax-based financing, grants, technical assistance, and—optionally—the establishment of a national energy-efficiency fund, which may be capitalised from emissions trading revenues. The Commission supports via guidance, best-practice exchange, and mobilisation of private capital.	Law No. 1818-IX "On Energy Efficiency"; Law of Ukraine "On the Energy Efficiency Fund"; Article 24-6 of the Budget Code — State Fund for Decarbonisation and Energy-Efficiency Transformation.	Compliant. Additional incentives for apartment-level heat metering may be introduced.

Narrative Analysis of the Alignment of Directive (EU) 2023/1791 with Ukrainian Legislation in the Field of Energy Efficiency and District Heating

1. The "Energy Efficiency First" (EE1st) Principle

State of Implementation

The "Energy Efficiency First" (EE1st) principle, established in Article 3 of Directive (EU) 2023/1791, is a cornerstone of the European Union's energy policy. It requires that all decisions within the energy sector—from governmental planning to enterprise-level investments—be made giving priority to demand-side measures before expanding supply.

In Ukrainian legislation, the EE1st principle is mentioned only declaratively in Law No. 1818-IX *"On Energy Efficiency"* and does not have the force of law as a binding decision-making criterion. The National Energy and Climate Plan (NECP) defines general goals, but it lacks tools for measuring progress, binding annual energy-saving indicators, and any obligation to assess demand-side measures during investment planning.

Identified Gaps

- No legal requirement to apply EE1st when approving national and local energy programmes, district-heating schemes, or investments in networks and cogeneration facilities.
- Absence of a cost-benefit-analysis methodology for selecting between infrastructure investments and energy-efficiency measures.
- Lack of monitoring and reporting on EE1st implementation within the NECP or sectoral strategies.

Recommendations

1. Enshrine EE1st as a legally binding norm in the Law *"On Energy Efficiency"* and require its application in the development of all energy policies and projects.
2. Develop a national methodology for assessing demand-side measures before undertaking generation or network-infrastructure investments.
3. Integrate EE1st into district-heating planning so that each new investment in networks or heat sources is preceded by an analysis of demand-reduction potential.

2. Apartment-Level Metering and Heat Billing

State of Implementation

Ukraine was among the first in the region to adopt Law No. 2119-VIII *"On Commercial Metering of Thermal Energy and Water Supply"*, which introduced mandatory building-level commercial metering of heat and water. The Law defines the procedures for installation, operator responsibility, and a prohibition on connecting buildings to networks without meters.

However, apartment-level heat metering remains incomplete. A significant portion of the housing stock—particularly buildings with vertical heating risers—is not equipped with individual heat meters or allocators. Installation is permitted only where it is "technically feasible" or "economically justified," leaving wide discretion to postpone implementation. As a result, apartment-level differentiation of consumption and payment on a factual basis has not been ensured.

Identified Gaps

- Absence of a mandatory requirement for apartment-level heat metering in all technically suitable multi-apartment buildings.
- Lack of a unified national methodology for allocating heating volumes and costs among apartments, including those without meters.
- Underdeveloped remote-data-reading systems, even though the Directive requires all new meters to allow remote reading by 2027.

Recommendations

1. Amend Law No. 2119-VIII to require apartment-level heat and water metering in all technically feasible buildings.
2. Establish a national heat-allocation standard for buildings with partial metering (use of allocators, floor-area correction factors, and loss coefficients).

3. Mandate remote reading for all heat, water, and IHS meters after 2027.
4. Provide financial support to homeowners' associations and co-owners through the Energy Efficiency Fund or the State Decarbonisation Fund for installing apartment-level meters.

3. Individual Heat Substations (IHS)

State of Implementation

Individual Heat Substations (IHS) are regarded as a key component for enhancing efficiency, automating consumption, and applying the EE1st principle at the building level.

The current legal framework does not make IHS mandatory; installation depends on the initiative of heating utilities or building owners.

In September of this year, the Government supported a draft law introducing a mandatory requirement for the installation of individual heat substations (IHS) in all buildings connected to district heating systems, including automatic weather-compensated control, metering devices, and remote data-reading functionality.

Identified Gaps

- No binding provision requiring IHS installation in all buildings connected to district heating.
- Undefined responsibility for installation (heating operator versus building owner).
- No systematic financial mechanism to support IHS implementation.

Recommendations

1. Adopt a dedicated IHS Law defining clear responsibilities: heating utilities shall design and install substations, with costs incorporated into transmission tariffs.
2. Establish mandatory IHS deployment for all district-heated buildings by 2030, with phased implementation for social and residential facilities.
3. Introduce state co-financing or preferential credit schemes to minimise the financial burden on consumers.
4. Develop a Technical Regulation on IHS specifying safety, remote-access, data-interoperability, and cybersecurity standards.

4. High-Efficiency Cogeneration and Efficient District Heating

State of Implementation

Ukraine possesses a foundational legal framework for cogeneration—Law No. 2957-IX on the development of high-efficiency cogeneration—and provisions in Law No. 1818-IX defining "efficient district heating." The existing criteria correspond to earlier EU norms (≥ 50 % renewables or waste heat, ≥ 75 % cogeneration, or ≥ 50 % combined share). However, Directive (EU) 2023/1791 establishes higher thresholds for renewable and cogeneration shares:

- from 2028 — ≥ 50 % renewables + waste heat or ≥ 80 % cogeneration;
- from 2035 — ≥ 80 % combined, with at least 35 % renewables or waste heat;
- by 2050 — 100 % carbon-free heat.

These new benchmarks are not yet reflected in Ukrainian law. There is no mechanism for monitoring the renewable share in heat supply or for reporting CO_2 emissions from district-heating systems.

Identified Gaps

- No national trajectory to 2050 for renewable shares in district heating.
- Absence of a monitoring and accounting mechanism for the origin of heat (renewable, waste, or cogenerated).
- Weak incentives for connecting independent cogeneration or renewable heat producers to heating networks.

Recommendations

1. Amend Law No. 2957-IX to introduce a timeline for meeting EU thresholds (2028, 2035, 2050).
2. Establish mandatory monitoring of heat-supply composition, including the renewable and cogenerated shares.
3. Create a system of *guarantees of origin* for heat, similar to renewable electricity certificates.
4. Introduce fiscal or tariff incentives to encourage integration of new cogeneration and renewable heat sources into district-heating networks.

5. Consolidated Findings

1. The most significant legislative gaps in Ukraine concern four core issues:
   - the absence of a legally binding EE1st principle;
   - the incomplete framework for apartment-level heat metering;
   - the lack of an adopted IHS law;
   - outdated criteria and insufficient monitoring for cogeneration efficiency.
2. Once the IHS bill is enacted, metering in apartments is made mandatory and cogeneration provisions are updated, Ukraine will achieve effective compliance with Articles 9–15 and 25–26 of Directive (EU) 2023/1791.
3. The existing institutional framework—the Energy Efficiency Fund, the State Agency on Energy Efficiency, and the Ministry for Communities and Infrastructure—provides adequate capacity for implementation, provided that EE1st becomes legally binding and new financing mechanisms are introduced for IHS and metering deployment.

6. General Recommendations

Policy Area	Key Actions Required
EE1st Principle	Enshrine the principle as legally binding; adopt a cost-benefit-analysis methodology; integrate it into heat-supply schemes and the NECP.
Apartment-Level Metering	Amend Law No. 2119-VIII to make apartment metering mandatory; define a unified allocation methodology; ensure remote data-reading capability.
Individual Heat Substations (IHS)	Adopt the IHS Law; require full implementation by 2030; provide state co-financing; adopt a national technical regulation.
Cogeneration / District Heating	Update efficiency criteria in line with EU milestones; introduce monitoring of renewable shares and a system of guarantees of origin for heat.
Institutional Support	Establish financing mechanisms through the Energy Efficiency Fund or the State Decarbonisation Fund to support heat-sector measures.

Final Conclusion

Ukraine's energy-efficiency framework is approaching full alignment with Directive (EU) 2023/1791. The decisive step toward complete conformity is the transition from declarative commitments to binding legal obligations, specifically by:

- establishing the *Energy Efficiency First* principle in law;
- mandating apartment-level metering;
- adopting the law on *Individual Heat Substations*; and
- updating cogeneration standards and monitoring mechanisms. Implementing these measures will allow Ukraine to progress from partial to full legal and technical harmonisation with the EU acquis, ensuring its integration into the EU Internal Energy Market and supporting the achievement of the 2030 and 2050 climate targets.

III. Analysis of the Alignment of National Legislation in the District Heating Sector with the Requirements of Directive (EU) 2024/1275 on the Energy Performance of Buildings

Directive (EU) 2024/1275 on the Energy Performance of Buildings (EPBD), adopted on 24 May 2024 within the framework of the European Green Deal, establishes the legal foundation for achieving a zero-emission building stock in the European Union by 2050. It introduces minimum energy performance standards (MEPS), promotes the development of zero-emission buildings (ZEB), and encourages the use of digital tools, such as the Smart Readiness Indicator (SRI).

The Directive creates a comprehensive framework for the renovation of residential and public buildings, integration of renewable energy into heating and cooling systems, and reduction of energy poverty. It serves as a cornerstone for the modernisation of the building sector across all EU Member States.

Article-by-Article Assessment of the Alignment of Directive (EU) 2024/1275 with Ukrainian Legislation on Energy Efficiency and District Heating

Article of the Directive	Provision of Ukrainian Legislation	Degree of Alignment
Articles 1–2 — Objective of a zero-emission building stock (ZEB) by 2050; definition of district heating; role of networks in building decarbonisation.	The Law of Ukraine “On Energy Efficiency of Buildings” No. 2118-VIII provides the general framework. A ZEB target is not yet legally enshrined; the role of efficient district heating is partially recognised through provisions related to the Energy Efficiency Directive.	Partial
Article 9 — MEPS for the worst-performing non-residential buildings; includes heating systems.	Minimum energy performance standards for the existing building stock as a systemic instrument are absent; only isolated requirements exist in building codes (DBN) and certification rules.	Needs improvement
Article 10 — Solar energy in buildings; integration with district heating networks.	Incentive provisions for rooftop PV and solar thermal systems are fragmented; integration with district heating is not regulated as a widespread practice.	Needs improvement
Article 11 — ZEB: new public buildings and all new constructions; connection to efficient district heating counts toward compliance.	ZEB criteria have not yet been introduced in Ukrainian law; conceptually, efficient district heating could be taken into account.	Needs improvement
Article 13 — Building technical systems: adjustment, management, hydraulic balancing, low-temperature solutions.	Building codes (DBN) and operational rules contain general requirements but lack mandatory hydraulic balancing and automation across the entire stock; individual heating substations (IHS) are not compulsory in all multi-apartment buildings.	Partial / Needs improvement
Article 15 — Smart Readiness Indicator (SRI), mandatory from 2027 for large non-residential systems; synergy with “smart” district heating.	The Smart Readiness Indicator has not been implemented.	Requires implementation
Article 16 — Data exchange on buildings and their systems (planning of connections to district heating).	Separate registries (EPCs) exist, but there is no fully interoperable data platform.	Needs improvement
Articles 23–24 — Periodic inspections of large systems	Inspections of heating and domestic hot water systems are fragmented; technical	Needs improvement

(reports with recommendations, submission to the database).	supervision exists, but no unified digital reporting and quality-control framework is in place.	
Article 25 — Independent experts (certification, public registers).	The institution of energy auditors has been established (Law No. 1818-IX), and registries are maintained; however, coverage of all EPBD	

1. General Context and Strategic Framework

Directive (EU) 2024/1275 updates the former Directive 2010/31/EU and sets the objective of full decarbonisation of the EU building stock by 2050.

It introduces a unified framework for energy efficiency and CO_2 performance standards through three core mechanisms:

- ZEB (Zero-Emission Buildings) — new buildings must consume minimal energy, sourced entirely from renewable or clean sources;
- MEPS (Minimum Energy Performance Standards) — gradual enhancement of minimum efficiency levels for existing building stock;
- SRI (Smart Readiness Indicator) — a digital readiness assessment tool for energy management and automation in buildings.

2. Status of Ukrainian Legislation

Ukraine adopted the Law "On Energy Efficiency of Buildings" No. 2118-VIII (2017) in line with its Association Agreement with the EU, thereby transposing the earlier EPBD 2010 version. However, the updated provisions of Directive (EU) 2024/1275 have not yet been transposed. Specifically:

- The concept of ZEB is not defined in Ukrainian law;
- MEPS for existing buildings have not been introduced;
- SRI and digital data exchange mechanisms are not implemented;
- The national EPC (Energy Performance Certificate) registry operates but is not integrated with data on technical systems or district heating plans.

3. Key Gaps (by Articles of the Directive)

1. Articles 1–2 — *Objective of a zero-emission building stock by 2050*:
   Ukrainian legislation lacks a national target for "zero-emission buildings" and a 2050 decarbonisation roadmap.
2. Article 9 — *MEPS for the worst-performing buildings*:
   Energy class requirements for existing stock are voluntary; there is no mechanism for progressively raising minimum standards.
3. Article 11 — *ZEB for new buildings*:
   Criteria for zero-emission design are undefined; new construction is regulated by local building codes (DBN) without uniform standards.
4. Article 13 — *Technical systems, hydraulic balancing, automation*:
   Weather-based control is required for new buildings, but there is no obligation to ensure hydraulic balancing or automation in the existing stock.
5. Article 15 — *SRI (Smart Readiness Indicator)*:
   The indicator has not been implemented, and there is no methodology for assessing building "smartness".
6. Articles 16–24 — *Data exchange, inspections, registries*:
   Registers of energy auditors and EPCs exist, but they are not linked with district heating monitoring systems and lack full transparency.

4. Implications for the Market and Heating Policy

The absence of MEPS and ZEB limits the demand for high-efficiency technologies and modern heating systems.

Without clear standards, it is impossible to scale up low-temperature district heating systems or deep renovation of buildings.

The lack of digital interoperability between building databases, heating systems, and energy planning tools hinders coordination and evidence-based policymaking in the thermal energy sector.

5. Recommendations

1. Update the Law “On Energy Efficiency of Buildings” by introducing the ZEB definition and a phased national roadmap toward 2050.
2. Develop national MEPS for the existing building stock, starting with the worst-performing 15%.
3. Implement the Smart Readiness Indicator (SRI) and a methodology for assessing building smartness, linking it to “smart district heating” programmes.
4. Create an interoperable data platform connecting EPCs, audit results, inspection data, and district heating systems.
5. Introduce mandatory automation and hydraulic balancing requirements for all new and renovated buildings connected to district heating networks.
6. Develop financial instruments to support deep renovation of buildings and integration with efficient district heating systems.

6. Summary Conclusion

Ukrainian legislation remains partially aligned with the 2010 version of the EPBD, but a comprehensive update is required to implement Directive (EU) 2024/1275 in full. The main deficiencies include:

- the absence of ZEB, MEPS, and SRI concepts;
- insufficient building automation;
- and a lack of a unified information and monitoring framework.

Advancing these instruments will enable Ukraine to shift from formal energy auditing to integrated building energy management, reducing energy consumption by 40–60% and aligning national policy with the EU’s decarbonisation objectives by 2050.

IV. Analysis of the Alignment of National Legislation in the District Heating Sector with the Requirements of Directive (EU) 2023/2413 on the Promotion of the Use of Energy from Renewable Sources (RED III)

Directive (EU) 2023/2413 on the promotion of the use of energy from renewable sources (RED III), adopted by the European Parliament and the Council on 18 October 2023, is the revised version of the basic act RED II (2018/2001/EU).

It establishes a binding, EU-wide target of **at least 42.5%** renewables in final energy consumption by 2030, together with sectoral objectives for transport, industry, heating and cooling.

Particular emphasis is placed on decarbonising the heating sector through the integration of bioenergy, heat pumps and waste heat, as well as opening networks to independent suppliers of "green" heat. RED III is a key element of the "Fit for 55" package and sets the pathway towards EU climate neutrality by 2050.

Article-by-Article Alignment Table for RED III (2023/2413) and Ukrainian Legislation on Energy Efficiency and District Heating

Article of the Directive	Provision of Ukrainian Legislation	Degree of Alignment
Definition of "waste heat/cold" (referenced in Articles 15a, 22a, 23, 24)	Basic definitions are partially reflected in by-laws to the *Law of Ukraine "On Heat Supply" No. 2633-IV* and in heat-supply planning methodologies; however, there is no comprehensive definition or mechanism for large-scale integration into district heating systems.	Partial
Article 15a — Minimum share of renewables in buildings; inclusion of district-heating heat as a contribution toward renewable targets	*Law of Ukraine "On Energy Efficiency" No. 1818-IX*; *Law of Ukraine "On Energy Efficiency of Buildings" No. 2118-VIII* (sector-specific). There is no explicit renewable-energy "quota" for buildings; heat supply from efficient networks may be considered in design solutions.	Needs improvement
Article 22a — Renewables in industry (possibility of counting waste heat from efficient DHS; indicative growth)	*Law No. 1818-IX* and *Law No. 2957-IX* on high-efficiency cogeneration. A systematic mechanism for accounting/crediting "waste heat" in industry is not yet fully regulated.	Partial
Article 23 — Binding growth targets for renewables in heating/cooling; sectoral potential assessment; minimum set of measures	The *National Energy and Climate Plan (NECP)* and *Law No. 1818-IX* provide a general framework; however, no statutory "binding" annual trajectory exists. Sectoral assessments are fragmented and based only on local heating-supply schemes.	Needs improvement
List of measures under Article 23 (renewable DHS, heat pumps, waste-heat recovery, etc.)	Support instruments exist sporadically (Energy Efficiency Fund, donor programmes), but there is no nationwide state programme for DHS; several pilots have been funded, yet no large-scale policy exists.	Partial
Article 24 — Indicative +2.2 p.p./year increase in RES + waste heat in DHS; network openness to third-party suppliers	*Law No. 2633-IV* does not establish an annual benchmark or a comprehensive regime of "open access" for independent heat producers. Local heat-purchase contracts are possible, but unified rules are lacking.	Needs improvement
Consumer transparency (share of renewables in the network; information disclosure)	*Laws "On Housing and Communal Services"* and *"On Commercial Metering of Thermal Energy and Water Supply" No. 2119-VIII* ensure basic transparency; however, the "green composition" of networks is not disclosed systematically.	Partial

Article of the Directive	Provision of Ukrainian Legislation	Degree of Alignment
Integration with power-system flexibility; metering and automation in DHS	Provisions on automation and individual heating substations (IHS) are fragmentary; there is no legal obligation for large-scale DHS automation, nor effective linkage with power-system balancing.	Needs improvement

Narrative Assessment of RED III (2023/2413) in Heating and Cooling: Ukraine's Alignment, Gaps, and Implementation Steps

1) Context and Purpose

RED III raises the decarbonisation bar for heating and cooling by requiring accelerated growth in the share of renewable and recovered heat, development of efficient district heating systems (DHS), third-party open access to networks, and greater consumer transparency. These requirements are embedded in the broader "Fit for 55" framework and the trajectory to climate neutrality by 2050. The purpose of this assessment is to compare core RED III requirements with current Ukrainian norms and the 2030 objectives of the National Energy and Climate Plan (NECP), identify gaps, and propose actionable recommendations.

2) Core RED III Requirements (Heating and Cooling)

- Annual increase in renewables for heating/cooling: at least +0.8 percentage points per year in 2021–2025 and +1.1 p.p. per year in 2026–2030; EU-wide benchmark around +1.8 p.p./year.
- Counting waste heat and "green" electric heating: option to partially credit these towards the annual increase (incentivising heat pumps, electric boilers, and heat recovery).
- Mandatory potential assessment and policy package: Member States must assess available RES/waste heat and implement at least two measures from a recommended list (e.g., connection of buildings to efficient DHS, displacement of fossil heat, support for heat pumps), with reflection in national plans.
- Benchmark for DHS: indicative annual increase of the share of RES + waste heat in DHS of roughly +2.2 p.p. in 2021–2030, with flexibility for systems starting from high shares.
- Third-party access (TPA): non-discriminatory connection of independent suppliers of renewable/recovered heat to large networks (>25 MW), with transparent grounds for refusal and an appeal procedure.
- Integration of waste heat: coordination between networks and industrial/commercial sources of residual heat; ability to count such heat towards RES targets.
- Power-to-Heat and thermal storage synergy with the grid: regular assessment of interaction potential between DHS and electricity networks, expansion of thermal storage and Power-to-Heat.
- Consumer transparency: disclosure of the RES/waste-heat share and system efficiency indicators on bills or supplier websites.

3) Ukraine's Legal Framework and Practice: Where We Stand

- Targets and plans: The NECP sets RES and energy-efficiency goals to 2030, including indicative heating targets. However, binding annual step-ups in the RES share for heating are not codified in law.
- RES heat and waste heat: Legislation contains incentives for alternative heat (e.g., tariff approaches), but no clear quotas/trajectories for systematic growth, no statistical methodology for accounting waste heat, and no dedicated incentives for its integration.
- Potential assessment and mandatory measures: Urban district heating schemes are foreseen, but their timeliness and quality vary; the menu of RED III measures is not codified as a mandatory minimum in national acts.

- DHS RES growth: There is no statutory rate for annual increases of RES + waste heat in DHS; steps toward biomass/CHP exist but without a “hard” benchmark.
- TPA to heat networks: Basic opportunities for independent producers are declared and connection rules are being prepared/adopted; nevertheless, robust non-discrimination controls, sanctions for unjustified refusals, and standardised heat purchase contracts are lacking.
- Grid synergy and storage: Obligations for regular joint assessments and planning of DHS–power system interaction are not yet embedded; thermal storage is at pilot scale.
- Transparency: Progress has been made on data openness, but there is no mandatory, standardised disclosure of fuel mix/RES shares and efficiency indicators for consumers.

4) Alignment Gaps vis-à-vis RED III

1. Absence of legally binding annual increases in the RES share for heating/cooling and for DHS systems.
2. Insufficient instruments for waste heat: no accounting methodology, coordination platforms, or financial incentives for connection.
3. TPA not fully operational: no binding, detailed procedures, SLAs or sanctions; absence of a standard heat purchase agreement.
4. Lack of integrated planning with the power grid and of requirements for regular assessment of Power-to-Heat/thermal storage potential.
5. Consumer transparency incomplete: non-standardised disclosure of RES/waste-heat shares and network efficiency indicators.

5) Recommended Implementation Steps (Immediate Priorities)

Normative and target framework

- Enshrine in law a trajectory of annual RES increases in heating/cooling (minimum yearly “steps”) and an indicative DHS benchmark; integrate these into the NECP with a monitoring mechanism.
- Update the definition and criteria for “efficient DHS” to reflect milestones towards 2035/2050 (share of RES + waste heat, or alternative emissions thresholds).

Waste heat and heat pumps

- Approve a statistical methodology for accounting waste heat and allow it to contribute to sectoral RES targets; establish coordination platforms between network operators and potential providers.
- Create financial incentives for waste-heat recovery and Power-to-Heat projects (grants/concessional loans; tariff recognition of thermal storage investments).

Third-party access (TPA)

- Adopt detailed connection rules with an exhaustive list of refusal grounds, an appeal process, timelines and service-quality metrics, and transparent criteria for accepting the least-cost, technically suitable heat.
- Introduce a standard heat purchase agreement between the network operator and an independent producer (including metering/balancing interfaces and price indexation).
- Empower the regulator to monitor non-discrimination and impose sanctions for unjustified refusals.

Transparency and consumer rights

- Oblige licensees to publish annually the fuel mix and RES/waste-heat shares for each DHS, alongside core efficiency indicators; display these data on bills or in customer portals.
- Define rules for public communication with communities regarding “green” network retrofits and milestone trajectories toward efficiency thresholds.

Integrated planning and storage

- Introduce regular joint assessments by electricity and heat network operators (every four years) of Power-to-Heat and thermal-storage potential; reflect results in network development plans.
- Enable and incentivise capitalisation of thermal-storage investments through tariffs as a tool to enhance system flexibility and integrate RES.

6) Consistency with the NECP and the 2030/2050 Trajectory

The NECP objectives for raising the share of RES in heat are aligned in spirit with RED III, but require conversion into legally binding annual steps, full rollout of TPA mechanisms, waste-heat accounting, and deployment of thermal storage and Power-to-Heat. With these measures and synchronised local planning (updated district heating schemes), Ukraine can converge towards the EU's indicative dynamics by 2030 and toward carbon-free heat by 2050.

7) Concluding Findings

1. Strategic alignment is high, but regulatory detail remains insufficient: the core requirements of RED III are acknowledged in policy documents, yet they require binding targets, procedures, and enforcement.
2. Critical execution levers: binding annual RES increases; effective TPA; methodologies and incentives for waste heat and Power-to-Heat; consumer transparency; and integrated planning with the power grid.
3. Sectoral impact: emergence of competition in heat generation, accelerated "greening" of DHS, reduced gas dependence, improved system controllability, and enhanced social trust through transparency.

Implementation priority (sequence of actions):

1. Codify annual RES increases in heating/cooling and an indicative benchmark for DHS;
2. Adopt detailed TPA rules with a standard contract and sanctions;
3. Approve a waste-heat accounting methodology and launch pilots with coordination platforms;
4. Mandate disclosure of RES/waste-heat shares and efficiency indicators for consumers;
5. Integrate Power-to-Heat and thermal storage into power and heat network development plans, with tariff-based cost recovery for investments.

Taken together, this package shifts Ukraine from partial alignment to near-full harmonisation with RED III in district heating, supporting NECP-2030 delivery and the transition toward climate neutrality by 2050.

Conclusions and Recommendations

Ukraine has formally aligned its regulatory framework with the key EU legal acts on energy efficiency—most notably the recast directive on energy efficiency, the directive on the energy performance of buildings, and the directive on renewable energy (as regards district heating).

At the level of targets, the National Energy and Climate Plan (NECP) to 2030 sets out benchmarks (reduced energy consumption, increased share of renewables, modernisation of district heating, and building retrofits) that broadly correlate with the EU decarbonisation and energy-efficiency trajectory. However, the ambition and legal enforceability of Ukraine's indicators remain below the requirements of the updated EU directives, and critical delivery mechanisms have not yet been translated into binding, monitorable, and sanctionable obligations.

The state of implementation can be characterised as "high framework alignment in primary legislation—medium practical alignment in secondary legislation and execution." Ukraine has introduced mandatory commercial metering of heat and water; established a regime of energy audits for large enterprises; codified the concept of "efficient district heating" and advanced high-efficiency cogeneration; and developed programmes for deep renovation and energy service (ESCO).

Substantial gaps nevertheless persist that hinder de facto convergence with EU standards: the "energy efficiency first" (EE1st) principle does not yet operate as a legally binding filter for decision-making; comprehensive mandatory apartment-level heat metering and remote reading are lacking; no legally mandated annual energy-savings obligations exist at levels commensurate with the new EU requirements; the mandatory 3% annual renovation rate for public buildings has not been embedded; the legislative framework for compulsory individual heat substations (IHS) is unfinished; third-party access to heat networks and the integration of waste heat require strengthening.

In sum, legal harmonisation has occurred predominantly at a conceptual level. To shift to an "EU-equivalent" pace of results, Ukraine must: raise the ambition and binding nature of national targets; detail and standardise the secondary framework (metering, billing, IHS, energy management, obligation schemes); and establish robust MRV (monitoring, reporting, verification) with clear accountability for non-compliance. Implementing these steps will align Ukraine's tempo with the EU on energy efficiency, building renovation, and the "greening" of district heating—delivering practical, not merely formal, conformity with the directives.

EU and Ukrainian Strategic Documents

The National Energy and Climate Plan (NECP-2030), approved in 2024, sets Ukraine's key 2030 objectives on decarbonisation, energy efficiency, and renewables. The NECP endorses overall renewables target of 27% in gross final consumption by 2030 (as aligned with the Energy Community), and 33% in heating and cooling. The plan outlines a wide array of measures: district heating reform under Third Energy Package principles (open market design, enhanced connection rules, incentives for cogeneration and renewables); bioenergy development (biomass/biogas pathway, biomethane guarantees of origin register); large-scale residential renovation via the Energy Efficiency Fund; support for distributed generation (heat pumps, community biomass); and approximation of national standards to EU norms (the "green deal" agenda). The State Target Programme for the Modernisation of District Heating Utilities (to 2030) focuses on reducing network losses, lowering specific fuel consumption, deploying individual heat substations (IHS), and achieving full building-level heat metering.

Alignment of Targets

Ukraine's strategic targets in the NECP are partly consistent with those of the EU. Ukraine likewise aims at climate neutrality and major emission reductions (65% by 2030). The NECP acknowledges that the district heating sector should reach the highest share of renewables (33%) across energy sectors, consistent with the EU's prioritisation of heating in the renewables agenda. That said, the formal benchmarks are more modest: 27% renewables overall versus the EU's higher ambition. The key shortfall is the absence of legally binding delivery mechanisms: the NECP sets declarative goals without specific annual "stepping-stone" trajectories or sanctions for non-achievement. Experts stress the need to "translate the NECP's paper targets into enforceable instruments" through primary and secondary legislation.

Recommendations: Embed in the NECP (and statute) mandatory annual trajectories for increasing the renewables share in heat, with clear indicators (e.g., stepped annual thresholds through 2030/2050). Ensure implementation of climate goals through new normative acts, including MRV mechanisms for progress and compliance.

District Heating Sector Reform

The NECP envisages EU-style reform of district heating: competitive market structures, support for cogeneration and renewables, non-discriminatory access for independent producers, improved boiler-house efficiency, and network modernisation. The modernisation programme also includes technical measures (IHS deployment, metering, network rehabilitation).

Assessment: These measures are important but lack explicit “green transition” targets. Comparative analysis indicates that while the strategic aim of reducing gas dependence and enhancing reliability aligns with the EU’s decarbonisation emphasis (towards 2050 and a 2030 renewables uplift in heat), the programme does not set concrete climate benchmarks, focusing instead on security and efficiency.

Recommendations: Beyond technical modernisation, include explicit climate targets (e.g., reducing gas share in district heating to zero by 2050) and instruments to deliver them. Introduce quantified renewables benchmarks within the State Programme (annual increases, minimum quotas, etc.).

The “Energy Efficiency First” Principle

The programme references energy efficiency objectives but does not operationalise EE1st as a mandatory decision-making criterion. In contrast, EU law makes EE1st a legal obligation, requiring the assessment of demand-side measures prior to infrastructure investment.

Assessment: EE1st is declared but not applied as a binding screen for projects in the heat sector.

Recommendations:
— Integrate EE1st into state programmes and primary legislation (e.g., the Law “On Energy Efficiency”);
— Introduce a cost-benefit analysis methodology for every district heating project, prioritising demand reduction;
— Establish monitoring of achieved savings.

Individual Heat Substations (IHS) and Metering

The programme envisages progressive IHS deployment, yet apartment-level metering in multi-apartment buildings is not mandatory. Comparative analysis concludes that IHS and sub-metering should become standard, as reflected in EU practice.

Recommendations: Amend the laws on district heating and commercial metering to mandate IHS and apartment-level metering in all buildings connected to district heating. Legally clarify allocation of responsibilities (utility versus owner) and financing mechanisms (e.g., tariff-based recovery).

Incentives for Renewables and Cogeneration

The programme promotes biomass and biogas without hard quotas, whereas the directives require obligatory annual increases in renewable heat.

Assessment: There are no quantified obligations for the renewables share in heat.

Recommendations: Introduce annual sectoral renewables growth targets for heat, with appropriate monitoring. Ensure coordinated planning for waste-heat recovery and the roll-out of high-efficiency cogeneration.

Market Openness (Third-Party Access, TPA)

National documents lack a comprehensive open-access regime for third parties to connect to heat networks; networks remain de facto municipal monopolies.

Recommendations: Implement Third Energy Package principles by granting independent "green heat" producers non-discriminatory connection rights. Develop standardised heat purchase agreements (PPAs), clear connection procedures, service-level agreements (SLAs), and appeal mechanisms with sanctions for unjustified refusals.

Financing Mechanisms

The programme provides for budgetary and credit instruments but no stable modernisation fund. The EU employs comprehensive facilities (e.g., investment vehicles and national funds).

Recommendations: Establish a national, stable financing mechanism for district heating modernisation—e.g., by expanding the Energy Efficiency Fund's mandate or creating a State Decarbonisation Fund for Heat.

Social Dimensions

In Ukraine, energy poverty is addressed via a separate system of subsidies and is not embedded in the modernisation programme. The EU, by contrast, foregrounds support for vulnerable consumers during the transition.

Recommendations: Integrate a social component into modernisation programmes: targeted measures and financial incentives for low-income households (e.g., grants for connection to efficient district heating or building envelope upgrades).

Coordination

Responsibilities are split among the Ministry for Communities Development, the Ministry of Energy, the State Agency on Energy Efficiency, and local authorities. EU practice requires cohesion via national strategies and municipal plans.

Recommendations: Enhance inter-institutional coordination at national level (e.g., inter-ministerial task forces or centralised planning within the NECP framework) and align heat-supply schemes with municipal energy plans.

Directive (EU) 2023/1791 on Energy Efficiency

This directive establishes a modern framework for improving energy efficiency, emphasising the EE1st principle; introducing mandatory national energy-savings contributions (circa 11.7% by 2030); energy efficiency obligation schemes (EEOs) for energy suppliers; strengthened requirements for metering, energy management, and consumer protection. Ukraine has enacted a suite of laws (energy efficiency No. 1818-IX; heat metering No. 2119-VIII; district heating No. 2633-IV; building energy efficiency No. 2118-VIII; cogeneration No. 2957-IX, inter alia) that broadly reflect the directive's core architecture. The report compares the directive's articles with existing national provisions, presenting a concordance table and compliance assessment.

Findings and Recommendations

1. EE1st: EU law renders EE1st legally binding across planning and investment. In Ukraine, EE1st is recognised in statute and the NECP but without binding effect. Recommendation: Enshrine EE1st as a compulsory criterion (amend Law 1818-IX or adopt a dedicated act), require cost-benefit analysis prioritising demand reduction for every project, and integrate EE1st into heat-supply schemes and the NECP.

2. National energy-savings targets: The directive requires a mandatory incremental target. Finding: No government-approved annual final-energy reduction path exists.

Recommendation: Legislate or enact by government decree a national annual reduction trajectory to 2030.

3. Energy Efficiency Obligation (EEO) schemes (Art. 9): Suppliers should deliver annual savings

Finding: The principle is acknowledged, but no state-approved quotas or scheme design is in force

Recommendation: Adopt a government-level EEO framework (by law or decree) requiring annual reporting on verified savings, with a focus on vulnerable consumers.

4. Energy management and audits (Art. 11): Large enterprises (>85 TJ/year) must implement ISO-compliant systems by 2027; entities >10 TJ must audit every four years. Finding: Law 1818-IX mandates audits for large consumers; functional alignment exists, but coverage thresholds and follow-up enforcement could be strengthened. Recommendation: Adjust thresholds to capture more enterprises and implement compliance monitoring for audit recommendations.

5. Heat and hot water metering (Arts. 14–15): Meters reflecting actual consumption are required; apartment-level metering or allocators in multi-apartment buildings. Finding: Ukrainian law robustly regulates commercial metering but lacks a clear legal mandate for universal apartment-level metering wherever technically/economically feasible. Recommendation: Amend Law 2119-VIII to mandate sub-metering, adopt a cost-allocation methodology, and require remote reading.

6. Individual Heat Substations (linked to EPBD/EED): A 2025 draft law proposes mandatory IHS in all buildings connected to district heating by 2030.

Finding: No enacted law defines responsibility and financing for IHS deployment

Recommendation: Adopt an IHS law specifying roles (design/installation by utilities; cost recovery via tariffs), phased deadlines to 2030, co-financing for social and residential buildings, and technical regulations (including cybersecurity).

7. Social measures and consumer information (Arts. 21–22): The directive highlights vulnerable consumers and awareness.

Finding: Awareness-raising is mandated in general terms; no formal definition of energy poverty or binding programmes.

Recommendation: Establish national programmes for consumer awareness and targeted support; legally define energy poverty criteria.

8. Heat planning (Arts. 25–26): Cities over 45,000 residents must adopt heat plans mapping EE, RES, and CHP potential.

Finding: Ukrainian law requires heat-supply schemes and municipal energy plans.
Recommendation: to reach full compliance with Article 25, Ukraine should:

- Legally embed the EE1st principle in local planning procedures;
- Mandate GIS-based mapping of RES and waste-heat potential;
- Introduce obligatory public consultation and cross-municipal coordination mechanisms;
- Define standardized indicators, monitoring, and reporting; and incorporate financial, social, and community-energy dimensions.

9. Efficient district heating (Art. 26): Progressive thresholds toward 100% “green heat” by 2050.

Finding: Ukraine defines “efficient district heating” (≥50% RES/waste heat; ≥75% CHP), but updated EU thresholds (2028/2035/2050) are not reflected; no comprehensive heat-mix monitoring.

Recommendation: Update cogeneration law No. 2957-IX with a compliance trajectory; implement mandatory heat-mix monitoring and a guarantee of origin system for renewable heat.

10. Skills and accreditation (Art. 28): Certification of auditors and managers.

Finding: Auditor accreditation exists; coverage can be improved.

Recommendation: Align national certification standards with the latest EU criteria.

Synthesis: The most material gaps relate to the lack of a binding EE1st, incomplete apartment-level metering, absence of a mandatory IHS law, and outdated thresholds for “efficient DH.” Implementing the above measures would enable Ukraine to practically implement the bulk of the directive’s key provisions.

Directive (EU) 2024/1275 on the Energy Performance of Buildings (EPBD)

This directive aims to fully decarbonise the building stock by 2050. The principal instruments are: Zero-Emission Buildings (ZEB) for all new buildings; Minimum Energy Performance Standards (MEPS) for the existing stock; and the Smart Readiness Indicator (SRI) to drive digital energy management. The EPBD provides the legal basis for mass renovation, integration of renewables in heating and cooling, and the reduction of energy poverty. Ukraine's Law No. 2118-VIII (2017) implemented the 2010 EPBD version; the 2024/1275 updates are not yet reflected in national law.

Findings and Recommendation

1. Zero emissions and ZEB (Arts. 1–2, 11): The directive sets the ZEB objective by 2050 and requires ZEB standards for new public (from 2027) and all new buildings thereafter.

Finding: No ZEB definition or 2050 roadmap exists in Ukrainian law; standards for new builds rely on local building codes (DBN).

Recommendation: Amend Law 2118-VIII to define ZEB and establish a staged roadmap with interim milestones (e.g., 2027, 2035).

2. MEPS for the existing stock (Art. 9): Start with the bottom 15% of buildings.

   Finding: No binding MEPS; only voluntary energy classes. Recommendation: Adopt national MEPS for residential and non-residential buildings, beginning with the worst-performing 15% and expanding coverage over time.

3. Integration of renewables (Arts. 10, 11): Rooftop solar and recognition of efficient district heating as part of ZEB compliance.

   Finding: Isolated rooftop incentives exist; systemic regulation of integration with district heating is lacking; ZEB criteria are absent.

   Recommendation: Introduce incentives for rooftop RES (e.g., guarantees of origin) and formally recognise connection to efficient district heating within ZEB criteria.

4. Automation and IHS (Arts. 13–15): Requires system tuning, automation, hydraulic balancing, weather compensation.

   Finding: Weather compensation is required for new buildings; mandatory hydraulic balancing and automation for the existing stock are absent; IHS are not compulsory in all multi-apartment buildings.

   Recommendation: Mandate balancing and automated control for all new and renovated buildings connected to district heating; update DBN and operational rules accordingly.

5. SRI (Art. 15): Mandatory from 2027 for large non-residential systems.

   Finding: SRI not implemented.

   Recommendation: Introduce SRI methodology and integrate it into comprehensive building certification; link SRI to "smart district heating" programmes.

6. Data exchange and oversight (Arts. 16, 23–24): Interoperable data flows between EPC registries, HVAC systems, and heat-planning tools.

   Finding: EPC and auditor registries exist, but no single digital platform or full quality control.

   Recommendation: Build an integrated data platform connecting EPC registries with heating-system data and municipal heat-planning; enable digital workflows among clients, certifiers, and network operators.

7. Inspections and independent experts (Arts. 23–27): Periodic inspections with mandatory reporting; accreditation and quality control of experts.

   Finding: Technical supervision exists and energy auditors are accredited, but quality control and linkage to network planning are incomplete.

Recommendation: Establish transparent quality-assurance for certification and reporting (e.g., cross-checking audit findings with inspection results) and link auditor/EPC registries to municipal heat-supply planning.

Summary: Ukraine partially aligns with EPBD 2010 but requires substantial updates to implement EPBD 2024/1275. Key gaps include the absence of a ZEB definition and 2050 roadmap, lack of binding MEPS for the worst-performing buildings, non-implementation of SRI, insufficient automation of the existing stock, and lack of a unified information system. Advancing these instruments (ZEB, MEPS, SRI, integrated digital platform, deep renovation) will enable a shift from formal auditing to full-fledged building energy management, reducing consumption by 40–60% and aligning national policy with the EU's 2050 goals.

Renewable Energy Directive (RED III)

Directive (EU) 2023/2413 raises the EU-wide renewables ambition to at least 42.5% of gross final consumption by 2030, with sectoral sub-targets.

In heating and cooling, RED III requires accelerated growth of "green heat" (RES + waste heat): +0.8 percentage points per year in 2021–2025 and +1.1 p.p. per year in 2026–2030; an assessment of waste-heat potential; implementation of at least two measures from the indicative list (e.g., connection to efficient district heating, fossil heat displacement, support for heat pumps); an indicative +2.2 p.p./year increase of RES + waste heat in district heating; open access for independent RES/waste-heat producers to large networks (>25 MW); and consumer transparency (disclosure of the RES share on bills).

These obligations interplay with wider "Fit for 55" initiatives for decarbonising heat.

Findings and Recommendations

1. National targets and law: The NECP-2030 sets 33% RES in heat (27% overall). Finding: The target is indicative, without statutory annual stepping-stones akin to RED III. Some incentives exist (boiler-house upgrades, partial biomass substitution), but no binding requirements or waste-heat accounting methodologies.

Recommendation: Legally codify annual RES growth trajectories in heat; adopt waste-heat accounting rules.

2. Potential assessment and measures: RED III requires potential assessments and at least two measures from the list

Finding: Heat-supply schemes and energy plans exist but vary in quality; the RED III measures are referenced in policy but not defined as a mandatory minimum in law.

Recommendation: Codify a mandatory policy package (e.g., heat-pump roll-out, efficient DH connections, fossil heat displacement) and require their reflection in municipal plans.

3. Third-party access (TPA): Non-discriminatory access and standardised connection rules.

Finding: Connection rules are being developed, but detailed procedures, standard heat PPAs, and effective sanctions for abuse of market power are missing.

Recommendation: Adopt comprehensive TPA regulations: standardised green-heat PPAs, clear timelines/SLAs, exhaustive refusal grounds with appeal procedures; empower the regulator to enforce and sanction.

4. Waste heat and storage: RED III promotes the accounting of waste heat and Power-to-Heat.

Finding: No national statistical methodology for waste heat; no coordination platforms between sources and network operators; no targeted finance for PtH or heat storage.

Recommendation: Approve a waste-heat accounting methodology, establish regional coordination platforms, and create financial incentives (grants, concessional finance, tariff recognition) for PtH and thermal storage.

5. Transparency and consumer rights:

Finding: Data openness has improved, but no standardised disclosure of fuel mix and RES share to end-users.

Recommendation: Oblige licensees to publish annual fuel mix, RES/waste-heat shares, and efficiency KPIs by network; display these data on bills or in customer portals; define community communication rules on “green” network retrofit plans.

6. Integrated planning with the power system:

Finding: No obligation for regular joint assessments of PtH/storage potential; storage projects are nascent.

Recommendation: Require four-yearly joint assessments by electricity and heat network operators; integrate results into network development plans; allow tariff-based capitalisation of storage investments.

7. NECP coherence:

Recommendation: Synchronise NECP indicators with RED III by making the targets annual, reportable, and enforceable, and by embedding TPA, waste-heat accounting, and system flexibility (storage, PtH) in national planning.

Summary: Ukraine’s strategic alignment with RED III is high, but regulatory detailing is insufficient. Critical levers are: legally mandated annual RES increases in heat; an effective TPA regime; waste-heat statistics and incentives; consumer transparency; and integrated planning. Implementing these measures will foster competition in heat generation, accelerate the “greening” of district heating, reduce gas dependence, and enhance system flexibility.

Priority actions include: setting annual RES growth and DH targets; adopting TPA rules and a standard contract; implementing waste-heat accounting; mandating disclosure of RES shares on bills; and integrating PtH/storage into network plans. Executing this package would move Ukraine from partial compliance to practical full harmonisation with RED III in district heating.