



Reforming the District Heating Sector of Ukraine (ReWarm)

Learning from the Eastern EU Best Practice Policy Tools

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Content

Who is GIZ?

The Initiative: A holistic, comprehensive study on the transformation of District Heating systems after joining the EU.

Scope of Research: Analyzing the transition of 5 former Eastern Bloc areas with similar Soviet-era legacy networks: **East Germany, Poland, The Czech Republic, Slovakia, and Latvia.**

Expertise: Conducted collaboratively by 5 renowned European energy think tanks.

Key Deliverables for Ukraine:

1. Identifying proven, actionable policy tools and regulatory frameworks.
2. Extracting "Lessons Learned" (both successes and failures) to avoid costly mistakes in Ukraine's DH reform.
3. Creating a roadmap for transitioning from subsidized, fossil-heavy utilities to financially viable, decarbonized markets.

GIZ Worldwide (2024 statistic)



GIZ in Ukraine:

30 years of successful cooperation

- On behalf of the **German Government**, the **European Union** and other donors, GIZ promotes the **reconstruction of Ukraine** in a sustainable and citizen-oriented manner and **pave the country's way to EU accession** – building a liveable future for all Ukrainians.

We focus on the following thematic areas:

- Energy and climate change mitigation
- Sustainable economic development
- Resilient society
- Multi-level governance

Around
46
projects

659 staff
work for
GIZ in
Ukraine

€858
million of
commissio
ns



General overview of the ReWarm project

- **Goal:** Improving the framework conditions for sustainable modernization of district heating enterprises in Ukraine, in line with the reconstruction plans in Ukraine, and continuously reducing specific CO2 emissions from district heating.

Duration: 01.04.2023 - 31.03.2027

Project Director: Dr. Winfried Damm

Political partner: Ministry for Development of Communities and Territories of Ukraine

Partners:

- State Agency for Energy Efficiency and Energy Savings of Ukraine
- Kyiv City Council
- Executive Committee of Odesa City Council
- Chernihiv City Council
- Executive Committee of Cherkasy City Council
- Zviahel City Council
- Kryvyi Rih Council
- Yaroslav Mudryi National Library of Ukraine



Kick-off of ReWarm project, the 5th of July 2024.

The "Laboratory of Transition" (Introduction)



Key Message: We are not just rebuilding; we are leapfrogging. Our study analyzes 30 years of data (1990–2025) from five nations that successfully navigated the transition from Soviet-era "Heat Monoliths" to modern EU markets.

Objective: To define a universal blueprint for DH resilience and decarbonization.

GIZ: Reforming the District Heating Sector of Ukraine (ReWarm)

District Heating Policy Recommendations for a Sustainable DH Sector in Ukraine

Best Practice Policy Tools.

*Evidence-Based Lessons Learned from Five Eastern European Countries:
Czech Republic · Slovakia · Eastern Germany · Latvia · Poland*

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Performance summary and status at a glance

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Synthesis: key messages and 3 priority focus areas

Objective and Key Messages

Objective: Lessons learned for a DH policy framework to combine 4 main policy goals: resilience, economic and environmental sustainability and user-centred services

Isolated interventions addressing a single goal are unlikely to succeed
=> DH transformation requires **integrated DH policy packages**

Key Focus Areas:

1 Finance

40-year infrastructure financing (public + private) — not primarily grants

2 Regulation

Independent regulator, investable tariffs, no political override

3 Targets

Binding RES law + operator transformation plans + MHP process

Also: A lot needs to be done to comply with EU standards

3 + 1 High-Level Energy Policy Goals

I Security of Supply & Resilience

Reliable supply: fuel disruptions, extreme weather, infrastructure failures.

Policy instruments

- Fuel diversification mandates
- N-1 reserve capacity requirements
- Technical standards & emergency preparedness

II Economic Viability (Long-term)

DH must be financially sustainable for all stakeholders, but their interests conflict:

Consumers: Affordable prices
DH companies: Full cost recovery + reinvestment

Public: Minimal subsidy, max efficiency and climate goals

Policy instruments

- Tariff & investment regulation
- Access to long-term finance
- Targeted subsidy design

III Environmental Sustainability

Reduce climate and air quality impacts through efficiency & decarbonisation

Policy instruments

- Binding decarb. targets
- RES integration obligations
- Energy efficiency standards & low-carbon technology support

IV User-Centred Services

Consumers need reliable heat, transparency, individual control, and responsive service.

Policy instruments

- Service quality standards & metering mandates
- Consumer information rights
- Accessible dispute resolution

Methodology: Five Main Work Steps

1

Analytical Framework Development

4 policy goals → 13 KPIs → 12 focus areas. Iterative, with DH specialists.

2

Data Collection by Country Experts

Policy matrix: Governance · Tariff · Consumer protection · Financing · Modernization · Decarbonization ...

3

KPI Expert Assessment

6-point scale vs. future-proof DH benchmark. AI cross-validation: ~85% concordance.

4

Comparative Country Analysis

3 levels: Aggregate by goal · Individual KPI · Qualitative policy analysis.

5

Policy Recommendations Derived

12 policy focus areas: Core challenges · Policy recommendations · Policy impact chains

12 Policy Focus Areas for DH Modernisation in Ukraine (overview)

5-country KPI performance averages (Poland included) · Status at a glance

1

Energy Efficiency First (EEF & HCA)

KPIs: G, J, K

3

Long-Term Decarbonisation + Resilience Strategy

KPIs: H, I, A

5

Clear Assignment of Responsibilities and Boundaries

KPIs: J, K

7

Price Regulation – Solve 2 Conflicting Goals

KPIs: C, D

9

Technical Modernisation & Loss Reduction

KPIs: G

11

The Last Mile — Substations, Metering & DHW

KPIs: J, K

2

DH is a CAPEX-Driven Business => Financing Facility

KPIs: D, E

4

Municipal Heat Planning

KPIs: I

6

DH Company Governance

KPIs: D, N

8

Consumer Protection

KPIs: L, M

10

Decarbonisation Technology Pathways

KPIs: A, H

12

DH Industry Association & Institutional Capacity *(supports all 11 FAs)*

FA 1: Energy Efficiency First (EEF) & Heat Cost Allocators (HCA)

Core Challenges

- EEF is a **binding EU/Energy Community obligation**: Always Efficiency before Supply!
- **HCA without technical prerequisite chain** redistribute costs rather than delivering savings.

Policy Recommendations

Rec 1A

Sequenced HCA mandate — only deploy after verified 6-step prerequisite chain: (1) Building heat meter → (2) pipe flushing/filtration → (3) DPCV at substation → (4) PICVs for riser balancing → (5) TRVs with calibrated bypasses → (6) HCA installation

Rec 1B

EEF policy measures: mandate hydraulically separated substations; link EEF compliance to all grant instruments; fund full package (substation + hydraulics + TRVs + HCA) as integrated investment — not HCA alone

Rec 1C

Demonstration first: pilot projects independently monitored; national rollout only after demonstrating net positive household savings, contractor market capacity, and prerequisite cost-effectiveness

FA 2: District Heating is a CAPEX-Driven Infrastructure Business

Core Challenge

Longterm, reliable investment framework needed: DH is a 40–60 years asset business, competing with 4-year political cycles (weakest KPI in entire set)

Policy Recommendations

Rec 2A

DH Reconstruction & Modernisation Facility needed: EU grants (25–35%) + IFI concessional loans (EBRD/EIB/KfW at 25–40yr) + state-guaranteed municipal bonds + tariff CAPEX recovery. Single-window application. Eligibility: approved heat plan + operator transformation plan.

Rec 2B

Asset-based tariff with explicit CAPEX recovery: Return on Assets (ROA) formula, fixed capacity charge (€/kW), 4–5 years regulatory periods, automatic fuel cost pass-through, 50% efficiency gain retention. Bankability: account separation + municipal guarantee backstop.

FA 3: Long-Term Decarbonisation and Resilience Strategies

Core Challenge

Binding targets: Without binding targets, DH sectors drift into fossil path dependence (e.g. Poland's coal share fell only 82% → 61% over 20 years without binding phase-out dates).

Policy Recommendations

Rec 3A

Binding national RES targets in primary law: e.g. 50% RES + waste heat by 2030, 80% by 2035, 100% by 2040. No new mono-fuel coal/gas capacity from law entry force. No 'temporary' fossil installations without approved transition timeline.

Rec 3B

Operational resilience & N-1: backup for largest generation plant mandatory. Small systems (< 50 GWh): heat pump + small backup biomass/gas is standard — prevents fossil lock-in without bureaucratic dual-fuel requirements.

Rec 3C

Operator decarbonisation roadmaps: all operators >10 GWh/yr must submit 2050 Decarbonisation Plan with 5-year milestones. Tariff approval conditional on plan submission and progress.

FA 4: Municipal Heat Planning (MHP)

Core Challenge

MHP is the spatial governance mechanism translating national targets into local action. **The process should be compulsory, but plan outcomes should not be legally binding.**

Policy Recommendations

Rec 4A

National law establishes MHP as required municipal function with three targeted regulatory functions: (1) **Disconnection regulation**: clear legal framework limiting individual disconnection without demonstrated cost-effective alternative; (2) **New-build connection mandate** in designated DH service areas; (3) **Year-round viability**: plans must address DHW and summer demand strategy.

Process binding (completion mandatory, penalties = grant ineligibility), outcomes non-binding. Operator decarbonisation plan (Rec 3C) mandatory input to MHP. Municipality–operator formal consultation required in law.

Why non-binding outcomes? Binding outcomes chill ambition, convert collaborative partnerships into compliance relationships, and reduce adaptability as technology evolves. The WPG 2024 (Germany) follows the same principle.

FA 5: Clear Assignment of Responsibilities and Boundaries

Core Challenge

Ambiguity over ownership boundary (Eigentumsgrenze) and service boundary (Leistungsgrenze) between DH company and building owner is a source of operational disputes across all five countries.

Policy Recommendations

Rec 5A

Define ownership and service boundary in primary law: DH company = heat meter at building entry + all network infrastructure. Building owner = substation (heat exchanger) + internal distribution + apartment metering. Model: Latvia Cabinet Regulation No. 876 (2008) or Germany AVBFernwärmeV §9–10.

Rec 5B

Prefer building-level contracts with housing associations (OSBBs): reduces billing disputes 60–80% vs. individual flat-owner contracts. OSBB representation as default for multi-apartment buildings.

Rec 5C

Mandate hydraulically separated substations: all new connections + reconstruction mandatory. Existing buildings: 5-year upgrade programme, priority by loss intensity. Spec: 4th-gen ready ($\leq 55^{\circ}\text{C}$), remote monitoring. Note: mandatory legislation under active parliamentary consideration in Ukraine (2026).

FA 6: DH Company Governance

Core Challenge

Governance structure — ownership model, corporate form, account separation — determines whether a company can access finance and sustain long-term investment.

Policy Recommendations

Rec 6A

Municipal/mixed ownership (40–100% local government) as dominant model: Corporate structure (GmbH/equivalent): separate from annual municipal budget cycles, credit-rating eligible. Avoid full privatisation (Czech/German experience: asset extraction → re-municipalisation at high cost).

Rec 6B

Mandatory financial account separation: generation, transmission/distribution, and trading — prerequisite for regulatory oversight, third-party access, and investor due diligence.

Rec 6C

Regulated Third-Party Access for independent heat producers: legal right to negotiate DH network access for waste heat, RES, CHP on non-discriminatory terms. Regulator sets transparent framework and arbitrates disputes. NOT full open access — negotiated bilateral with regulatory backstop.

FA 7: Price Regulation – Solve 2 Conflicting Goals

Core Challenge

Affordability vs. Profitability conflict: keeping heat affordable risks undermining the financial viability needed for long-term investment — and vice versa. Ukraine's current regulation is over-granular and does not solve this conflict. The solution is **principle-based regulation**: set the ROA rate and CAPEX recovery principles; allow professional discretion within that framework; build in explicit loss reduction and energy efficiency incentives.

Policy Recommendations

Rec 7A

Independent national regulator: fixed-term appointments (5–7yr), protected from dismissal. Tariff revision by parliamentary act explicitly prohibited in primary law except narrow national emergency with full compensation obligation.

Rec 7B

Principle-based ROA methodology: allowed revenue = justified OPEX + asset depreciation + Return on Assets × asset base + efficiency incentive. 4–5 year periods, automatic fuel pass-through, companies retain 50% efficiency gains. Full methodology published with worked examples.

Rec 7C

Targeted social protection — not general price caps: direct heating allowances to verified vulnerable consumers. Poland's price freeze = short-term consumer protection + long-term sector destruction.

FA 8: Consumer Protection

Core Challenge

Consumer satisfaction is the political sustainability of DH. **A sector that loses customer trust loses market share and ultimately its rationale.**

Policy Recommendations

Rec 8A

Ukrainian General Conditions for Heat Supply Ordinance (model: AVBFernwärmeV): standard contract covering duration, price adjustment clauses (objective published indices), service quality standards, metering responsibilities, planned interruption notice, dispute resolution. Published by regulator; companies may offer enhanced terms, never below standard.

Rec 8B

Three-tier dispute resolution: Tier 1 — DH company response within 10 working days; Tier 2 — independent regulator binding ruling within 60 days; Tier 3 — administrative courts/consumer ombudsman. Automatic financial compensation for sub-standard heat supply.

FA 9: Technical Modernisation and Heat Loss Reduction

Core Challenge

Legacy Soviet-era infrastructure: high losses, single-pipe systems, oversized networks. Integrated approaches yield far higher efficiency returns than piecemeal interventions.

Policy Recommendations

Rec 9A

Pre-insulated two-pipe networks as mandatory standard: all reconstruction — no exceptions for 'temporary' single-pipe repairs. New networks: maximum design supply temperature 90°C. Phase out Soviet steam networks on priority schedule (loss intensity + remaining asset life).

Rec 9B

Integrated generation + network + substation modernisation: grants structured to incentivise integrated project proposals. Eastern Germany's post-reunification federal programme = the model. Piecemeal approaches yield significantly lower efficiency returns.

FA 10: Decarbonisation Technology Pathways

Core Challenge

Every coal or gas boiler installed today represents a 25–35 year lock-in commitment. Technology pathway depends on system size — there is no single solution.

Policy Recommendations

Rec 10A

Prioritise waste heat integration: mandatory connection assessment for industrial waste heat (>5 GWh/yr, >60°C or upgradeable, within 5 km of DH network). MHP must include systematic waste heat mapping (data centres, food processing, metro, wastewater, industrial parks). Third-party access framework (Rec 6C) is the enabling mechanism.

Rec 10B

Large heat pumps + thermal storage: industrial HPs (5–20 MW thermal) + storage (1,000–10,000 m³) enable Power-to-Heat and flexible grid services. Prerequisite: network temperature reduction (Rec 9A) must be sequenced together. By system size — Large (>500 GWh): biomass CHP → heat pumps → geothermal. Medium (50–500 GWh): biomass + waste heat. Small (<50 GWh): electric heat pumps directly.

FA 11: The Last Mile — Substations, Metering & DHW

Core Challenges

- **Ownership boundary (Eigentumsgrenze) and service boundary (Leistungsgrenze)** between DH company and building owner are often unclear — causing investment disputes and underinvestment in substations.
- **Enforcement gap:** Czech 6/6 vs. Slovakia 2/6 metering — same legal obligation, enforcement is the differentiator.
- **DHW discontinuation** eliminates 15–25% of annual DH revenue — accelerating network viability decline.

Policy Recommendations

Rec 11A

Mandatory hydraulically separated substations — all new construction + reconstruction. Existing buildings: 5-year funded programme. Spec: 4th-gen ready ($\leq 55^{\circ}\text{C}$), weather-compensated, remote monitoring.

Rec 11B

Sequenced metering mandate — individual meters for new builds + two-pipe systems; HCAs only where full prerequisite chain verified (see FA 1, Rec 1A); annual inspections + fines for non-compliance.

Rec 11C

Year-round DHW as default service scope — discontinuation requires regulatory approval; new/reconstructed substations must include DHW capability as default.

FA 12: DH Industry Association and Institutional Capacity

Why a sector association matters:

A strong sector association **fills the data, standards, and advocacy and capacity building gaps**, that neither individual companies nor regulators can efficiently address. **It is a force multiplier for all other recommendations**, making regulation more effective, investment more bankable, and transformation more informed.

Rec 12: Establish or strengthen a Ukrainian DH Industry Association

Rec 12A

Annual sector statistics: KPI tracking, investment data, tariff levels, heat loss rates — without reliable statistics, evidence-based regulation is impossible.

Rec 12C

Regulatory representation: formal consultation role in regulatory methodology development and legislative processes — co-architect of the framework.

Rec 12E

Training & professional development: heat pump engineering, network digitalisation, financial management — addressing technical skills gaps as decarbonisation accelerates.

Rec 12B

Technical standards: voluntary standards for equipment, substation specs, metering, consumer service quality — reduces regulatory burden and harmonises contractor market.

Rec 12D

Capacity building: structured training programmes for DH operators, municipalities, and regulators — governance, finance, procurement, stakeholder engagement.

Rec 12F

European knowledge exchange: formal membership in Euroheat & Power — benchmarking data, best-practice transfer, and policy dialogue at EU level.

From Evidence to Action

12 Policy focus areas for a DH policy framework to achieve 4 main policy goals based on Lessons Learned from Czech Republic · Slovakia · Eastern Germany · Latvia · Poland

Isolated interventions addressing a single goal will not succeed
=> DH transformation requires **integrated DH policy packages**

Key Focus Areas:

1 Finance

40-year infrastructure financing (public + private) — not primarily grants

2 Regulation

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3 Targets

Binding RES law + operator transformation plans + MHP process

A lot needs to be done to comply with EU standards. Move quickly to gain large benefits.



Thank you!

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APPENDIX / BACKUP SLIDES



Grid Triage & Optimization



Chase water losses

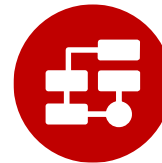
the water is costly, even more the heat to bring new water to supply temperature.

Implement strict penalties for unauthorized water drainage from the heating system. Stop leakages as high priority.



Improve pumps

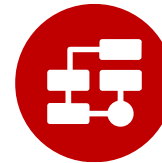
Save electricity - wherever possible use high-efficient magnetic pumps and variable frequency drives



Zero Tolerance for Water Losses:

Prioritized deployment of acoustic and digital leakage detection systems. Water replacement equates to massive heat and electricity waste.

Targeted Pipe Replacement: Focusing only on critical, high-loss main pipelines before the heating season.



Allow proper grids/Hydraulic Balancing:

Optimizing supply and return temperatures to reduce network thermal inertia.