ENABLE DHC

# INVESTMENT PLAN - FACTSHEET

## For the District Heating system in in Vienna

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**Prepared by:**
AIT

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| DATA | Datasets, microdata, etc. | ☐ |
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*This template is prepared to support consortia participating in the LIFE Clean Energy Transition subprogramme in developing investment plans for existing or new district heating and/or cooling systems. The goal is to facilitate the preparation of plans that meet the "efficient district heating and cooling" criteria outlined in the Energy Efficiency Directive article 26, which is further explained in Commission Recommendation (EU) 2024/2395 [1].*

[1] Commission Recommendation (EU) 2024/2395[1] of 2 September 2024 setting out guidelines for the interpretation of Article 26 of Directive (EU) 2023/1791 of the European Parliament and of the Council as regards the heating and cooling supply, available at https://eur-lex.europa.eu/eli/reco/2024/2395/oj/eng

# 1. Case Study Context and Transformation Objective

## 1.1. Current state of the system

The heat is distributed through multiple pumping stations, including **Donaustadt, Simmering 1 and 2, Kagran, Spittelau, Reichsbrücke, Wehlistraße, and Arsenal**, with additional pumping stations located at each plant. The pumping system is regulated by pressure differences at the pumps and several critical network points. The total pumping electricity demand amounts to **30 GWh** per year. The network includes approximately **11.000** substations, with an average connected capacity of 350 kW per customer. The temperature levels vary depending on demand and adapt to outdoor temperatures. The primary network can reach temperatures of up to 145°C, while the secondary networks are regulated between **63°C** and **90°C**. The peak load of the network is around 2.600 MW for an outdoor temperature of -15° degrees. The network is managed by Wien Energie LLC and Wiener Netze LLC, and is owned by the city of Vienna. Maintenance activities include pipe inspection, leakage detection and replacements. Wien Energie uses publicly accessible geographic data to map its district heating network.
The Vienna Heating Plan 2040 (Figure 1) provides an overview of the City of Vienna, the existing district heating (DH) network, and its planned expansion.

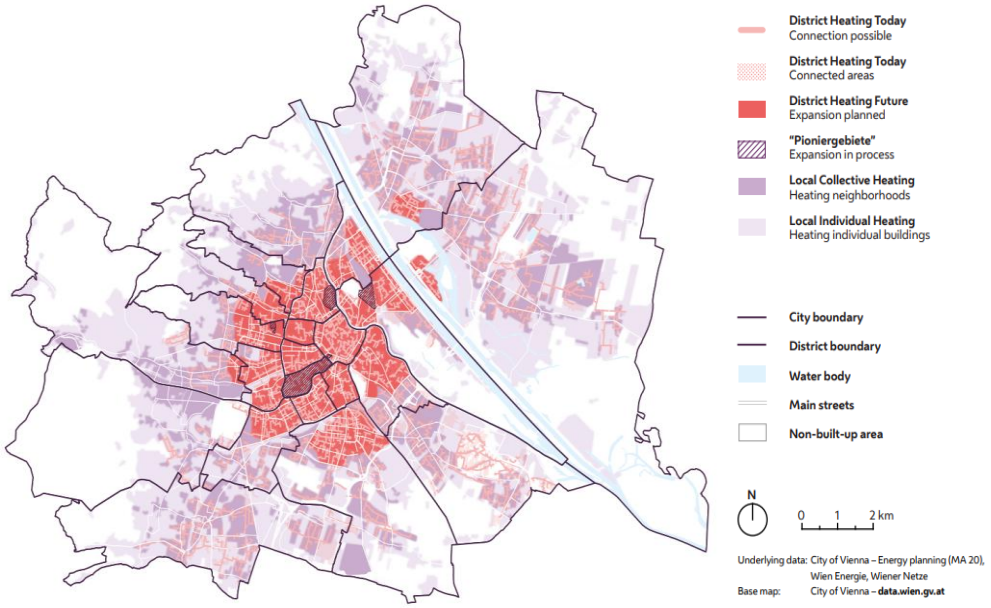



**Figure 1 – Vienna Heating Plan 2040, Status: May 2024; Source:** *Stadt Wien*

Currently, approximately 35% of buildings are connected to the DH network. According to the underlying decarbonization scenarios, district heating is expected to supply around **56% of Vienna's total heat demand by 2040**, while the remaining 44% will be covered primarily by heat pumps, neighbourhood-scale energy solutions, and other renewable heating technologies.

To achieve this target, the expansion of the DH network is considered a central component of Vienna's heat transition strategy, particularly in densely populated urban areas where heat demand density is high and the potential for decentralized renewable heat generation is limited. In the designated *District Heating Future Areas* (*Fernwärme Zukunft-Gebiete*), the city explicitly states that, for district heating to operate economically, as many apartments within a building as possible should be connected to the network. However, no specific minimum connection rate has been publicly disclosed. In addition, comprehensive district heating expansion is actively promoted and implemented in so-called pioneering areas, which are intended to accelerate the transition towards a climate-neutral heat supply.

## 1.2. Strategic market analysis

Supplying around 30% of the total heat demand in Vienna, Wien Energie reports that its district heating network currently supplies:

- **~470,000 households (residential units)**
- **~8,000 business customers (non-residential customers)**

**Residential buildings:** The residential sector is by far the dominant customer segment. The available evidence suggests that district heating is mainly connected to multi-family apartment buildings, municipal housing (Wiener Wohnen), cooperative housing developments, large residential complexes and new urban development districts (e.g., Nordbahnviertel, Seestadt).
The figure of 470,000 households corresponds to approximately **one quarter of all dwellings in Austria and well over half of Vienna's dwellings**, indicating that the network is heavily concentrated in dense urban residential areas.

**Non-residential buildings:** The approximately 8,000 non-residential customers include a broad range of building types: Office, Retail and commercia, Hotels, Hospitals, Universities and educational facilities, Municipal and Industrial and service-sector facilities buildings.
The decarbonisation strategy and new investment delivered to a new tariff called **KLIMA Fit**. It is the first Viennese district heating tariff whose price directly tracks how far the heat supply has moved away from fossil fuels. Below, the network is described and then at prices for customers:

**Effects on the district heating system**
District heating will grow. It covers just over 40% of Vienna's heat demand today, and the city wants that share to reach 56% by 2040. That means more connections and more network investment, especially as buildings switch from gas boilers.
The heat sources are changing. In 2025, only 16.43% of district heating came from renewable energy. About half still comes from gas-fired plants. **Geothermal energy, large heat pumps, waste heat and later green gas** are meant to replace that share step by step.
The system is becoming more flexible. Heat pumps link the heating system to the power grid, and thermal storage such as SCALE UP separates when heat is produced from when it is used. Running the network now means balancing electricity prices, renewable surpluses and seasonal demand, not just firing gas plants.

Prices still depend on gas. Because gas remains such a large share, rising gas prices feed directly into heating costs. For example, the Austrian gas price index was about 40% above the previous year by August 2026. Cutting this exposure is one of the economic reasons for decarbonising.

**Two tariff models**

| | Official price notice (Preisbescheid) | KLIMA Fit (indexed) |
|---|---|---|
| Who it applies to | Most existing customers | All newly connected buildings since 2025 |
| How the price is set | Maximum price set by the authority, plus voluntary discounts | Annual index from the Austrian Energy Agency (AEA) |
| Price components | Basic price per $m^2$ and energy price | Capa<br>city price and energy price |

## 1.3. Seasonal availability: potential substitution of fossil fuels

The district heating system in Vienna operates 18 plants and generates approximately 6.000 GWh of thermal energy per year. Different kinds of plants supply the network, including hot water boilers, heat from waste incineration, combined heat and power plant, biomass boilers, heat pumps and power to heat units. **Error! Reference source not found.**Vienna's district heating system relies on a diverse mix of energy carriers, including natural gas, biomass, waste incineration and electricity.
Table 1 contains the electricity and heat production of the Wien Energie GmbH 2023 in GWh.

| Performance data of the WIEN ENERGIE GmbH for 2023 | GWh |
|---|---|
| **Total electricity production** | **5,475.5** |
| Caloric production | 4,049.9 |
| Biomass | 85.9 |
| Hydropower | 834.4 |
| Windpower | 398.2 |
| Photovoltaics | 107.2 |
| **District heating sales** | **5,427.4** |
| | |
| CGH Wien Energie | 2,569.6 |
| Waste and hazardous waste incineration | 1,200.0 |
| Peak load boiler | 522.3 |
| Geothermal and ambient energy | 96.0 |
| Heating centers | 206.3 |
| Biomass power plant | 117.4 |
| Waste heat | 1,200.9 |
| - Network losses | -485.0 |

**Table 1 - Electricity and heat production of the Wien Energie GmbH 2023 in GWh**

Vienna's district heating network has significant potential for integration of renewable energy sources. 2.500 MW of additional renewable generation is planned to be implemented over the next 30 years.

## 1.4. Scenarios for the DH network

The optimisation model will be assessed across a set of scenarios designed to capture the principal techno-economic and regulatory uncertainties. A scenario will address geothermal availability risks, varying the assumed resource potential, achievable drilling success rates, and the timing of capacity expansion to test how robust the system will remain when deep geothermal will contribute less — or later — than planned. A second group will introduce the construction of a new waste incineration plant, examining alternative commissioning dates, installed capacities, and levels of heat and electricity output, together with the consequences these will have for waste treatment capacity, residual load, and the competition this flexible source will create with other generation and conversion technologies. A third group will focus on assessing the surrounding uncertainties — above all electricity prices, whose future trajectory will depend on fuel and $CO_2$ price developments, the pace of renewable build-out, and market design, and which will therefore be varied across a wide but plausible range alongside the cost of capital, demand growth, and policy assumptions. Taken together, these scenarios will allow the model to identify which technology choices and infrastructure decisions will perform well across the full range of plausible futures, and to highlight the conditions under which the system will become vulnerable.

# 2. Solutions and Investment Scenarios Assessed

The comparison of different scenarios are under going and will be finalised until June 2027.

# 3. Investment and Implementation Outlook

## 3.1. Expected Impact

The city of Vienna wants to be climate-neutral by 2040, and Wien Energie plans for heat pumps and geothermal energy to supply around 56% of Viennese households by then. To get there, Wien Energie is investing €3.2 billion in the energy transition up to 2030. About €1 billion of that goes into expanding and decarbonising district heating.

## 3.2. Implementation Roadmap

**1. Deep geothermal energy: the deeep project in Aspern**

In 2023, Wien Energie and OMV set up a joint venture called deeep to develop deep geothermal energy. They started with about €20 million for planning. Wien Energie The partners plan up to seven plants in Vienna with a combined capacity of about 200 MW, which is enough for up to 200,000 households. **The first plant is in Seestadt Aspern (22nd district).**

**2. Large-scale thermal storage: SCALE UP**

SCALE UP is coordinated by Wien Energie and funded by the EU Innovation Fund. It aims to be the first full-scale demonstration of a large underground tank thermal energy storage system. The tank' size is 20 MW of power, about 40,000 $m^3$ of volume and a storage capacity of roughly 2,200 MWh.

**3. Large heat pumps**

Vienna's district heating network has been built up with large-scale heat pumps that recover waste heat from urban sources: the first, at Kraftwerk Simmering in 2019, uses waste heat from the power plant's cooling water, while the flagship installation at the ebswien wastewater treatment plant in Simmering is one of Europe's most powerful heat pumps, recovering heat from treated wastewater and delivering more than 90 °C — its first stage (55 MW, up to 56,000 households) has run since December 2023, with the final stage (110 MW, up to 112,000 households) planned for 2027. A 16 MW heat pump at the Spittelau waste incineration plant recovers heat from flue gas and supplies about 16,000 households, and smaller projects of roughly 3 MW each use residual heat from Therme Wien and waste heat from a data centre for Klinik Floridsdorf.

**Outlook**

These projects are meant to work together. Geothermal energy provides steady baseload heat, large heat pumps tap urban waste heat and renewable electricity, and SCALE UP's seasonal storage moves summer surpluses into winter. Together they are the backbone of Vienna's plan to phase out natural gas in district heating by 2040.

## 3.3. Key Risks and Enabling Conditions

Vienna's district heating projects depend heavily on the public framework around them. Changes to policies, regulations, administrative procedures or strategic priorities can affect implementation, operation, timelines and investment conditions. The city's own planning instruments make this link explicit: energy spatial planning decides where which energy source may be used, strict rules govern the replacement of fossil heating systems, and subsidies are differentiated according to that spatial planning. A shift in any of these — for example a change in the geothermal or water-use permitting regime, a slower phase-out of fossil heating, or a reallocation of the subsidy framework — would directly affect the project pipeline described above, from the deeep wells in Aspern to the heat pump expansions in Simmering and the SCALE UP storage site. Local environmental requirements on water, wastewater and emissions add a further layer of regulatory conditions that must be met before and during construction. Effective risk management therefore requires continuous monitoring of the regulatory environment, a clear allocation of responsibilities between the City of Vienna, Wiener Stadtwerke, Wien Energie, OMV in the deeep joint venture and the funding bodies, and proactive mitigation measures.

Energy price volatility affects operating costs, revenues, expenditure, competitiveness and investment returns, and this exposure is unusually direct in Vienna's case. Because a substantial share of district heating still comes from gas-fired plants, wholesale gas prices feed straight into the cost of heat: the Austrian gas price index stood around 40% above the previous year by August 2026, and partial decarbonisation has not yet broken that link. Uncertainty about future $CO_2$ prices adds a second source of cost risk, because fossil generation in the system remains subject to EU emissions trading, so $CO_2$ prices affect both project costs and overall financial performance. At the same time, the fee structure adds its own sensitivity. For customers under the official price notice, the regulated maximum price and the voluntary discount set by Wien Energie determine revenue; the discount has fallen from 43% in 2023/24 to 37% in 2025/26 and to 30% in 2026/27, at a cost of about €70 million to the company, and the availability of such relief depends on politics rather than on cost recovery alone. For KLIMA Fit customers, the capacity price is indexed 50% to construction costs and 50% to personnel costs, while the energy price follows an index built from the current heat source mix — so the tariff itself transmits both cost inflation and the pace of decarbonisation. These measures support informed decision-making and improve resilience: ongoing monitoring of market and policy developments, regular updates to the financial assumptions, an assessment of alternative price trajectories, and sensitivity analyses.

Sustained decreases in heat demand could negatively affect revenues and economic performance. In Vienna this risk is structural rather than incidental: the strategy itself counts building renovation as its first main lever for reducing demand, so falling consumption is a policy goal and a revenue risk at the same time. The district heating expansion plan in the 2022 Compass Lexecon study projects supply rising to 8.40 TWh by 2040 from 7.55 TWh in 2021, which assumes that new connections offset the demand saved through renovation. If refurbishment outpaces new connections, or if the population growth track

runs below Scenario 1 (Main), the freed capacity of about 1 TWh and the planned 2 TWh of new capacity may not be fully absorbed, leaving assets underused. To mitigate this, the project plans to improve the management of production and distribution activities in order to optimise asset utilisation, reduce losses from underutilised capacity, increase operational efficiency and enable the flexible use of lower-cost energy sources. The flexibility built into the system helps here: large heat pumps can be run when electricity is cheap, geothermal energy supplies steady baseload with low marginal cost, and the SCALE UP storage allows heat to be produced when conditions are favourable rather than only when it is needed. Commercial measures aimed at increasing market penetration — connecting additional buildings, converting properties still on gas, and retaining consumers through the KLIMA Fit tariff — will also support revenue stability and the long-term economic sustainability of the district heating system.
One point worth flagging for your deliverable: the market data in Vienna's case are moving quickly, and the current figures for renewable share, discount levels and consumer prices are drawn from the sources in the earlier sections rather than from a long-term study. If the risk section is meant to stand on its own, it may be worth adding a short note on which inputs are assumed versus observed.

## 3.4. Stakeholder Engagement & Endorsement

Stakeholder engagement was conducted in close collaboration with Wien Energie, the local district heating company. Its participation provided valuable operational knowledge and local expertise, helping to assess technology options, and develop a heat supply transition pathway that will be modelled with the next project months until June 2027.

# 4. Conclusions and Key Lessons

The next step is to model the energy system and assess the uncertainties. It will allow robustness of Wien Energies decarbonisation pathway and investment decisions. The capital for Vienna's district heating projects comes from five kinds of stakeholders: the municipal utility group, an industrial partner, Austrian federal funders, EU funding bodies and capital-market investors. In practice, Wien Energie pays for most of the investment from its own balance sheet. Public grants then cover the extra cost and risk of new technologies such as deep geothermal energy and seasonal storage.

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# GET IN TOUCH


**Project Coordinators**

Riccardo Battisti

Chiara Lazzari

**E-mail**

riccardo.battisti@ambienteitalia.it

chiara.lazzari@ambienteitalia.it

**Website**

https://enabledhc.ambienteitalia.it


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