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Article

Heat transition: Municipalities need federal support in decommissioning natural gas networks

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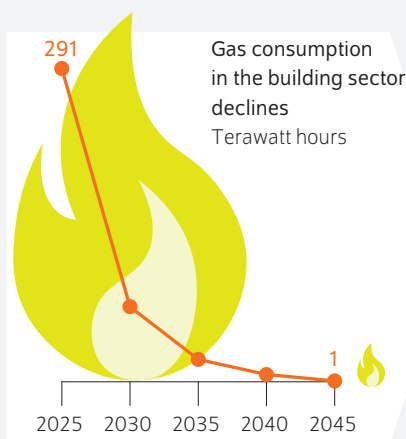
AT A GLANCE

Heat transition: Municipalities need federal support in decommissioning natural gas networks

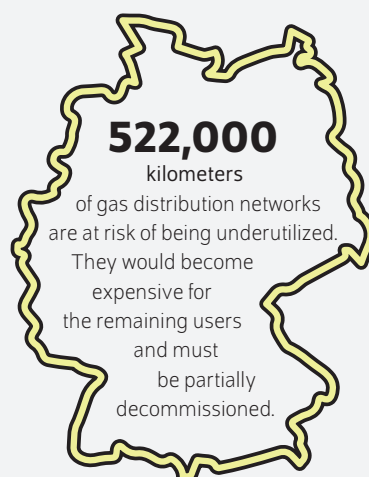
By Isabell Braunger, Philipp Herpich, Franziska Holz, Julia Rechlitz, and Claudia Kemfert

- Decline for natural gas demand will successively lead to the large-scale decommissioning of the natural gas distribution network
- Study investigates if re-municipalization of the natural gas distribution networks can speed up the natural gas phase-out
- Case study of Baden-Württemberg shows that there is uncertainty in municipalities; their heat plans do not address the decommissioning of natural gas networks
- Regulatory framework and the municipalities' financial dependency on the natural gas sector prevent decommissioning of natural gas infrastructure
- Municipalities and public utilities need support in organizing the decommissioning of the natural gas networks and to ensure public services can be financed

Natural gas demand will decline over the course of the heat transition, but municipalities must still ensure the heat supply



Source: Authors' depiction.



How can the networks be decommissioned?

- Re-municipalization
- Municipal heat plans
- Adjusting the regulation

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FROM THE AUTHORS

“The transition to a climate-friendly heat supply is a challenge for the municipalities. With low natural gas demand, the gas distribution networks will become superfluous in some cases. Even if municipalities buy these networks back, cost efficiency takes precedence over climate action. At the same time, network operators also have the obligation to connect.” — Franziska Holz —

MEDIA



Audio Interview with Franziska Holz (in German)
www.diw.de/mediathek

Heat transition: Municipalities need federal support in decommissioning natural gas networks

By Isabell Braunger, Philipp Herpich, Franziska Holz, Julia Rechlitz, and Claudia Kemfert

ABSTRACT

Large parts of the existing natural gas distribution networks must be decommissioned due to the decarbonization of the heat supply. However, there are neither regulatory nor economic incentives for the gas network operators to do so and delaying the decommissioning could be expensive for the remaining customers. This Weekly Report analyzes to what extent municipalities can partially decommission the natural gas infrastructure with the help of municipal heat planning and by re-municipalizing the gas industry. This study also outlines the challenges associated with these instruments. Accordingly, re-municipalization does not necessarily result in the gas networks being decommissioned faster, a fact that remains unconsidered in the existing heat plans. Furthermore, the current regulatory framework, which is based on cost efficiency and the obligation to connect, makes decommissioning more difficult. In addition, the municipalities have a financial incentive to continue generating revenue from gas, partially because alternative income sources for funding public services are unavailable. Thus, the regulation must be adjusted and the federal and state governments must provide more support for the municipalities in organizing the partial decommissioning of the natural gas infrastructure.

Germany has long relied on natural gas for residential heating. In 2020, the share of natural gas heating was 45 percent, with around 522,000 kilometers of natural gas distribution networks in operation.¹ Large amounts are invested into network expansion and maintenance every year: In 2019, the around 700 gas distribution network operators in Germany² invested 1.5 billion euros in the networks.³

The Act on Heat Planning and the Decarbonization of the Heat Networks (*Gesetz für die Wärmeplanung und die Dekarbonisierung der Wärmenetze*), which came into force on January 1, 2024, is meant to accelerate the heat transition. Its aim is a gradual decline in the use of natural gas through renovations, increasing electrification, and the expansion of district heating. Even in scenarios with a high share of synthetic gases such as hydrogen, long-term scenarios for the energy transition in Germany predict a decline in use of the gas distribution networks (Figure 1).⁴ Thus, parts of the networks will no longer be able to be operated economically.⁵ Organizing the decommissioning⁶ of the natural gas networks and coordinating it with the development of other energy networks, such as electricity and district heating, will be central to the municipal heat transition.

In this Weekly Report, different possibilities for dealing with the challenges of the heat transition are considered, such as the buy-back of natural gas networks or the municipal heat plans that are now required; to do so, we analyze the heat plans already in place in some municipalities in Baden-Württemberg. This analysis also includes interviews with

¹ Bundesnetzagentur and Bundeskartellamt, *Monitoringbericht 2020. Report* (2021) (in German; available online. Accessed on March 5, 2024. This applies to all other online sources in this report).

² Bundesnetzagentur, *Eckpunktepapier Netze. Effizient. Sicher. Transformiert.* (2024) (in German; available online).

³ Bundesnetzagentur and Bundeskartellamt, *Monitoringbericht 2020.*

⁴ Bundesministerium für Wirtschaft und Energie, *Langfristszenarien für die Transformation des Energiesystems in Deutschland 3* (2021) (in German; available online).

⁵ Daniel Then et al., "Impact of Natural Gas Distribution Network Structure and Operator Strategies on Grid Economy in Face of Decreasing Demand," *Energies* 13, no. 3 (2020): 664 (available online); Conor Hickey et al., "Is There a Future for the Gas Network in a Low Carbon Energy System?" *Energy Policy* 126 (2019): 480-493 (available online).

⁶ Decommissioning refers to shutting down parts of or the entire network. This is considered separately from a possible dismantling, in which the pipes are removed from the ground.

actors in the heat transition and considers the economic and regulatory barriers to the heat transition.

Municipalities want to influence natural gas distribution networks via re-municipalization

One way for local authorities to handle the heat transition is to buy back the natural gas networks. However, this is not an uncontroversial undertaking. Recently, Hamburg bought back the energy networks and Berlin is also considering purchasing its local gas utility.⁷

Municipalities have various expectations related to re-municipalization that may not materialize in practice. On the one hand, they want to accelerate the energy transition and influence the gas utilities accordingly. However, this objective conflicts with the regulatory framework, which stipulates an obligation to connect households and, thus, restricts any network downsizing (Box 1). In addition, the municipalities will have to amortize their investments and municipal companies will operate under a profit-oriented approach. The more and the longer they sell natural gas, the higher the profits. Thus, the financial prospects often get in the way of taking climate action.

Two paths to re-municipalization

Municipalities have two options for re-municipalizing the energy networks. First, a municipality can apply with a municipal company when a new concession is awarded. The Energy Industry Act (*Energiewirtschaftsgesetz*, EnWG) applies to the selection of the future concession holder when awarding a new concession (Box 1). The tendering procedure must be non-discriminatory. The municipal company is not guaranteed to be awarded the concession rights in the tender procedure. If the concession rights are transferred to another company, the former concession holder is entitled to appropriate remuneration for the network, which can be based on future revenue.

Alternatively, municipalities can purchase the gas network operator that holds the concession rights. The State of Berlin, for example, is considering purchasing shares of the gas utility Gasag.⁸ The advantage of this is the continuity of operations, as the gas utility would remain intact and the knowledge required to operate the network would be retained. However, such a purchase involves risks, as the municipality would take on the company's obligations while future profits are difficult to predict in the transition phase of the heating and energy markets. To determine the purchase price, municipalities must evaluate the energy sector conditions, such as future gas demand, the amount of hydrogen available regionally, and the expected fuel and carbon prices.

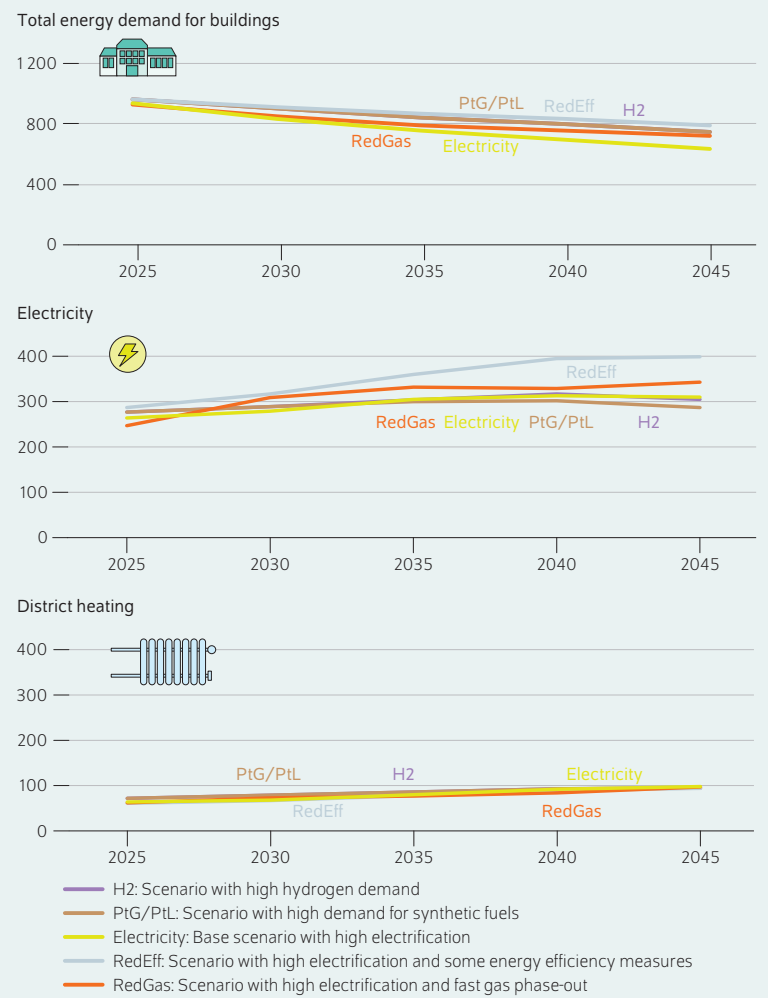
⁷ Philipp Herpich, Franziska Holz, and Konstantin Löffler, "Wärmewende in Berlin: Versorgungssicherheit nach dem Erdgas mit erneuerbaren Energien gewährleisten," *DIW Wochenbericht* no. 49 (2023) (in German; available online).

⁸ CDU and SPD, *Koalitionsvertrag 2023-2026* (2023). *Das Beste für Berlin* (in German; available online).

Figure 1

Long-term forecast of the energy demand for buildings, including electricity and district heating demand in the building sector in Germany

In terawatt hours



Sources: Federal Ministry for Economic Affairs and Energy (2021); authors' depiction.

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Residential heat demand will decline as a result of renovations and other energy efficiency measures. In contrast, the demand for electricity and district heating will increase.

The key assumptions on which a purchase is based should be published because such a purchase involves public funds that will then be unavailable for the energy transition. It must be taken into account that in the future, hydrogen will only replace a fraction of the amount of natural gas that is currently being consumed (Figure 2). There is a broad scientific consensus that hydrogen is not suitable for use in residential heating because it will be scarce, expensive, and inefficient.⁹ The political recognition of these problems is reflected in the National Hydrogen Strategy, which does not

⁹ Jan Rosenow, "Is heating homes with hydrogen all but a pipe dream? An evidence review," *Joule* 10, no. 6 (2022): 2225-2228 (available online).

Box 1

Regulatory framework for natural gas distribution networks

From an economic viewpoint, natural gas networks, like all pipeline-based infrastructure, are natural monopolies. This means that the construction and operation of one network is more efficient than the construction of multiple networks due to the high fixed costs and relatively low operating costs. Natural gas networks in the European Union are subject to regulation to ensure that natural monopolies do not exploit their advantage at the expense of consumers with high prices and low investments.¹

The regulation of the natural gas networks adheres to three basic principles: non-discriminatory access for natural gas sellers to the pipeline network, the unbundling of the network companies from the natural gas sellers, and the regulation of network charges and profits. A regulatory authority monitors the compliance with these principles; for the distribution network operators, this body is either the Federal Network Agency or the state regulatory authority. Network fee regulation is mandated in Germany as an incentive regulation, meaning it aims to provide an incentive for network operators to operate efficiently.² To this end, efficiency compar-

isons are performed between similar companies.³ The similarity is determined using structural parameters such as the number of connections.

The concession contracts for gas distribution networks are awarded as an easement contract for an entire municipal area for up to 20 years.⁴ Concession holders must ensure that gas networks are safely operated and expanded, provided this can be done economically. In particular, there is an obligation to fulfill all connection requests within the municipality, i.e., to build new pipelines and connections if necessary (general obligation to connect).⁵ The municipalities can also take additional local community matters into account in the tenders for the concession contracts. However, the federal objectives of the obligation to connect and cost efficiency take priority over municipal-specific targets such as climate action.

¹ Implementation in Germany is regulated in the EnWG.

² Cf. Regulation on the incentive regulation of the energy supply networks (ARegV) (in German; available online); Astrid Cullmann et al., "No Barriers to Investment in Electricity and Gas Distribution Grids through Incentive Regulation," *DIW Weekly Report* no. 6 (2015) (available online).

³ In contrast to incentive regulation, pure cost-based regulation (cost-plus regulation) would stipulate for all costs to be offset and thus provide an incentive for unnecessary investments.

⁴ Section 46 of the EnWG.

⁵ Section 18 of the EnWG.

clearly repudiate the use of hydrogen in residential heating but recognizes that the use of hydrogen in buildings has largely been rejected and will only be considered in a few individual cases.¹⁰

Re-municipalization: Conflict of interest between climate action and profit generation

The mere political will for re-municipalization is insufficient. If municipalities are considering re-municipalization, the sum they must pay to the former concession holder significantly influences the purchase decision. The purchase price determines how much natural gas must be sold in the future in order to amortize the investments. In Hamburg, it took ten years following the purchase to recover one third of the costs.¹¹

In the future, however, there will be no time for municipalities to amortize the investments. According to climate targets, carbon emissions must decrease. Thus, natural gas can only be delivered until 2045 at the latest and consumption will decline well before then. This fact must be reflected in the purchase decision and price; otherwise, municipalities

will be paying high sums for fossil infrastructure and will lack funds in other areas for the energy transition.

In any case, the decision to re-municipalize should be included in a municipal heat plan that clearly sets out the remaining gas volumes and provides a framework for the operation of the remaining network. The heat plan should also consider the foreseeable lack of hydrogen and the decline in heat demand overall (Figure 3).

The municipalities are experiencing a conflict of interest, as they must choose between climate action and natural gas profits following re-municipalization. In addition, the regulatory framework prescribing a general obligation to connect ensures that decommissioning of parts of the gas network is hardly possible. This prevents more climate action even if a municipal company is operating the gas network. These requirements are laid out in the EnWG (Box 1) and thus cannot be influenced by the municipalities.

Municipal heat planning should be used to plan the decommissioning of natural gas distribution networks

The Act on Heat Planning and the Decarbonization of the Heat Networks came into effect on January 1, 2024.¹² Its

¹⁰ Bundesregierung, *Fortschreibung der Nationalen Wasserstoffstrategie* (2023) (in German; available online).

¹¹ Andreas Dassel, *Zehn Jahre Rückkauf der Energienetze. Ein Gewinn für Hamburg und das Klima* (2023) (in German; available online).

¹² Heat Planning Act (*Wärmeplanungsgesetz*), (in German; available online).

aim is to make the heat supply greenhouse gas neutral and to provide support in achieving climate targets by 2045. It requires all municipalities in Germany with more than 100,000 inhabitants to develop a heat plan by mid-2026. All municipalities with fewer than 100,000 inhabitants have until mid-2028 to carry out their heat planning and municipalities with fewer than 10,000 inhabitants are subject to simplified planning requirements. The planning process contains seven steps, and the plan must be reviewed or continued every five years (Figure 4). Various stakeholders, such as natural gas or heat network operators and representatives of public interests, are to be involved in the process.

The Heat Planning Act provides access to previously unavailable data, for example data from energy companies and the associations of the craftsman and chimney sweeps, about connections to the natural gas network, heating systems, or consumption. This new data makes it possible for municipalities to take a leading role in heat planning and its coordination.

Heat planning can contribute to overcoming the insufficient planning for the heat transition, to creating investment security for renewable energy infrastructure and to adjusting consumers' expectations. Ideally, heat plans would contain clear statements on the medium and long-term natural gas coverage of a neighborhood. Natural gas customers would then know by when they would have to replace their gas heating and natural gas network operators would be able to make their investments with foresight and make targeted investments in maintenance where the networks are in operation for longer.¹³ Such a planned approach to the decommissioning of the gas distribution networks is recommended but not required in the Heat Planning Act. The following analysis of municipal heat planning in some municipalities in Baden-Württemberg shows that the municipalities cannot be expected to directly address natural gas grids and their decommissioning in their heat planning.

Baden-Württemberg has already implemented municipal heat planning

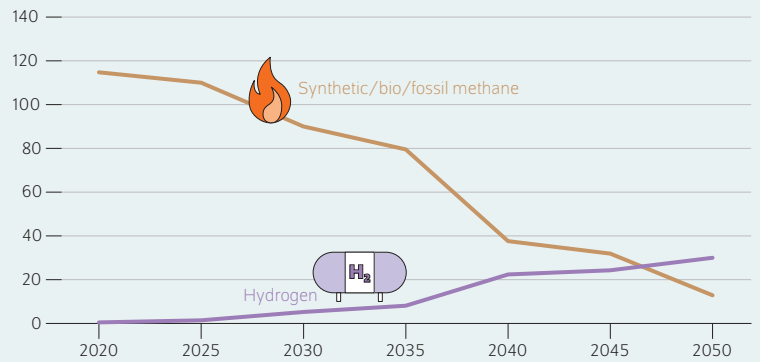
The first state in Germany to implement heat planning was Baden-Württemberg, where it has been mandatory for large municipalities since December 2020. Its municipalities must present their heat plans by the end of 2023. An evaluation of these initial experiences in Baden-Württemberg provides insights into implementation that is relevant for the rest of Germany. The data for this analysis are from interviews with 20 representatives of the most important interest groups of the heat transition in Baden-Württemberg as well as five scientific experts.¹⁴ Representatives of public utilities, network

¹³ When planning the gradual decommissioning, risk-determining factors should be taken into account, such as the age of the network, high upcoming maintenance investments, the expected decline in gas consumption due to district modernization, the advanced age of the gas boilers, anchor customers for district heating, and upcoming civil engineering measures that could favor the relocation of heating networks.

¹⁴ The detailed evaluation of the interviews is available in Isabell Branger, "Communal heat planning: Overcoming the path-dependency of natural gas in residential heating?" *Environmental Innovation and Societal Transitions*, Vol. 48 (2023): 100768 (available online).

Figure 2

Long-term forecast of natural gas and hydrogen demand in Berlin's climate neutrality strategy
In petajoules



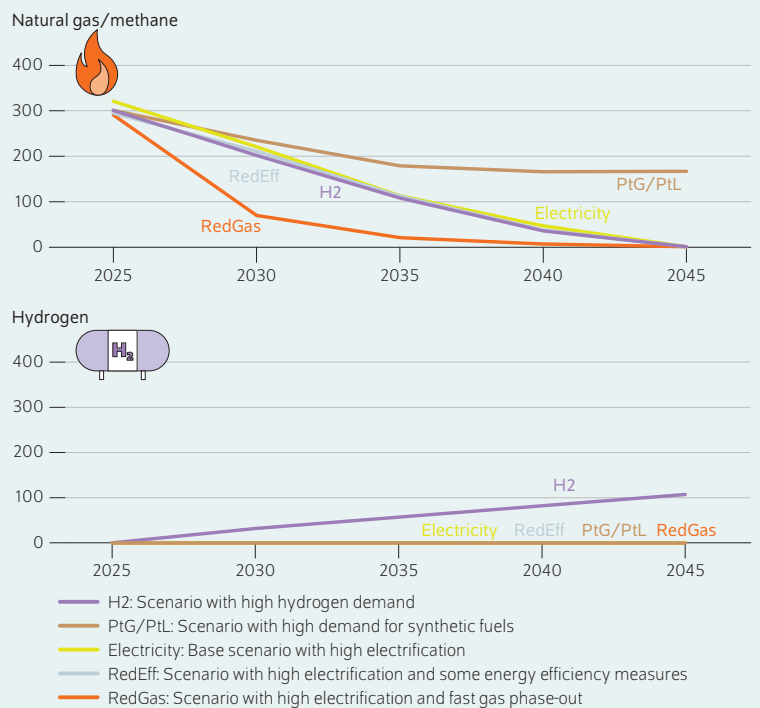
Sources: The Institute for Ecological Economy Research (IÖW) on behalf of the Berlin Senate Department for Urban Mobility, Transport, Climate Action and the Environment; authors' depiction.

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Renewable hydrogen will only be available in limited amounts in the future and will barely replace natural gas in the pipelines.

Figure 3

Long-term forecast of demand for natural gas and hydrogen in the building sector in Germany
In terawatt hours



Sources: Federal Ministry for Economic Affairs and Energy (2021); authors' depiction.

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Except in an extreme scenario, gas demand will decline considerably by 2045. Hydrogen will not play a role in the building sector.

Box 2

Analysis of actors in Baden-Württemberg

The data for this analysis come from interviews with 20 representatives of the most important interest groups of the heat transition in Baden-Württemberg as well as five scientific experts. Among those interviewed were representatives of public utilities, network operators, energy agencies, municipal actors, and the State Ministry of Food, Rural Affairs and Consumer Protection. The semi-structured interviews were conducted between October and December 2021 and evaluated using a qualitative content analysis.¹

In addition, six heat plans from Baden-Württemberg were analyzed from the municipalities of Lörrach, Freiburg, Giengen, Baden-Baden, Obersontheim, and Kirchheim-Unterdeck. The municipal heat plans for these municipalities were completed and available online by the end of 2023. The analysis is based on a matrix that focuses on the future development of the gas network in the heat plan and investigates different qualitative dimensions. These dimensions include defining areas with declining gas demand, identifying and explaining the risk factors involved in decommissioning the gas network, and developing concrete measures for decommissioning. In addition, where available, the more general discussion of the issue was evaluated.

¹ Jochen Gläser and Grit Laudel, *Experteninterviews und qualitative Inhaltsanalyse: als Instrumente rekonstruierender Untersuchungen*, 4th ed. (2010: VS Verlag für Sozialwissenschaften) (in German; available online).

operators, energy agencies, and the State Ministry of Food, Rural Affairs and Consumer Protection were interviewed (Box 2). In addition, six published heat plans from municipalities in Baden-Württemberg were analyzed.

Heat plans do not sufficiently consider the decline of natural gas consumption

The evaluation of heat plans from Baden-Württemberg shows that they have not sufficiently taken into account the need to decommission natural gas distribution networks. Concrete decommissioning plans, for example by classifying priority areas, are not included in the heat plans. The plans do not explicitly state when the natural gas distribution networks are likely to be decommissioned, even for areas designated as priority areas for district heating supply. The actors ascribe this to a high level of uncertainty regarding the future availability of renewable gases such as hydrogen.¹⁵ As a result, natural gas customers remain unsure as to how long they will be able to continue to operate their gas heating despite the existing heat plans.

¹⁵ See, for example, the municipal heat plan of the Landkreis Lörrach (in German; available online).

Uncertainty is only one reason why municipalities in Baden-Württemberg are not sufficiently taking into account the decommissioning of the natural gas distribution networks. Municipalities also face economic and regulatory barriers during planning and implementation. While the results are from interviews conducted in Baden-Württemberg, they provide insights into the framework conditions that apply nationwide and are thus formulated generally and relevant for municipalities in other German states.

Decommissioning natural gas networks reduces municipal revenues

So far, the business models of municipal energy and heat utilities have been significantly based on the sales of natural gas.¹⁶ In 2017, public utilities employed three times more employees in natural gas operations than in district heating operations;¹⁷ it can be assumed that this ratio has not changed much over the past years. Utilities must develop new competencies, strategies, and business models for the heat transition. The interviews show that adjusting business models can lead to conflicting objectives, especially when it comes to expanding district heating in areas with an existing natural gas network.

Indeed, in many municipalities, the profits of the public gas utilities have been used to cross-finance other public services.¹⁸ A decline in profits from a municipal gas utility could lead to financial challenges for the municipalities.¹⁹

If the natural gas network belongs to a private operator, the municipal budget loses out on income from concession fees.²⁰ Concession fees are an important source of revenue, especially for smaller municipalities. Many municipalities, therefore, have little interest in the end of the natural gas sector, as one of the interviewees pointed out. At the same time, the municipalities have the opportunity to take an active role in designing municipal heat planning.

Partial decommissioning of natural gas infrastructure is limited by existing regulation

The existing (incentive) regulation of natural gas distribution networks is designed to expand and maintain the networks, while reducing the size of the networks has not been possible to date. As long as there are even isolated connections, existing networks must remain in operation.²¹

¹⁶ Isabel Schrems and Lorena Eulgem, *Die Rolle des Erdgasgeschäfts von Stadtwerken für die kommunale Daseinsvorsorge – Eine Fallstudienanalyse* (2022) (in German; available online).

¹⁷ Thomas Bruckner et al., "Kommunale Energieversorger: Gewinner oder Verlierer der Energiewende?" *Wiso Diskurs* 04 (2017) (in German; available online).

¹⁸ Cf. Bruckner et al., "Kommunale Energieversorger."

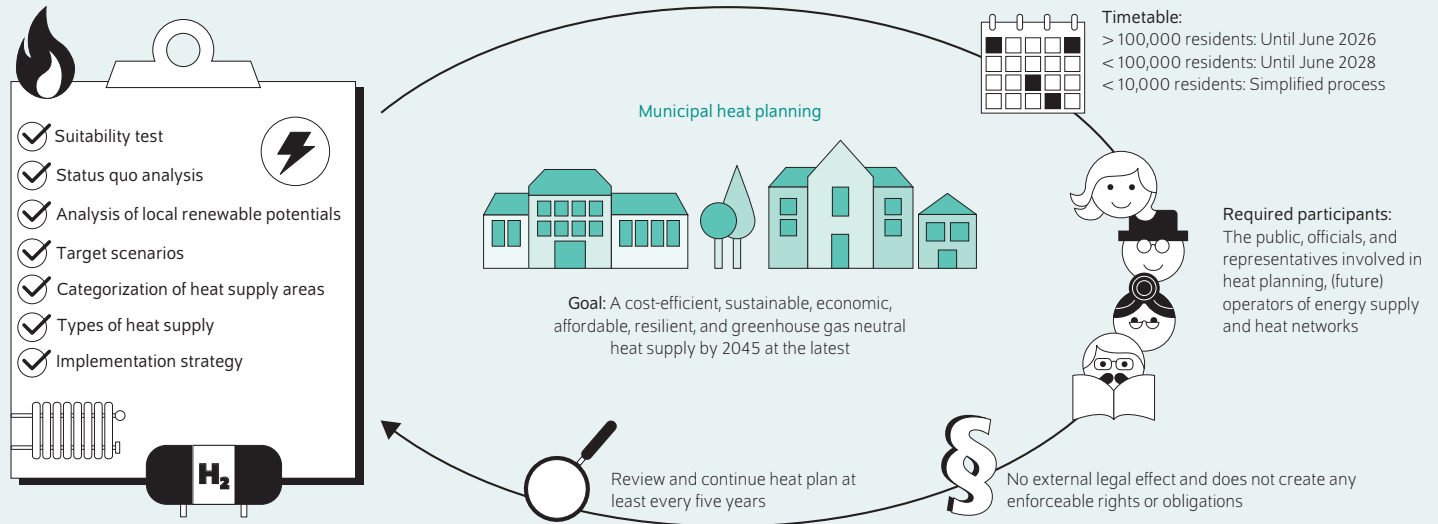
¹⁹ Schrems and Eulgem, *Die Rolle des Erdgasgeschäfts von Stadtwerken für die kommunale Daseinsvorsorge*.

²⁰ Municipal network operators pay concession fees too. However, they are deducted from the profits of the municipal company and reduce the amount of revenue that can be used to finance public services.

²¹ *Energiewirtschaftsgesetz, EnWG*, sections 11, 17, 18, and 20 (in German; available online).

Figure 4

Central elements of municipal heat planning



Source: Heat Planning Act; authors' depiction.

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The Heat Planning Act requires municipalities to prepare a heat plan by either 2026 or 2028.

The maintenance and operation costs of the networks are passed on to the connected gas customers. If customers successively switch to a renewable heat supply in the future, the network charges will increase for the ever-fewer remaining gas customers.²² This could reduce the acceptance of the heat transition, for example among renters who do not have a choice in their heating system and are forced to assume the rising network charges.

The concession contracts between municipalities and gas network operators set the framework for developments in the network. However, municipalities have very little influence on large parts of the content of the concession contracts. The concession area always covers the entire municipal area by law and reducing it, for example due to the municipal heat plan, is not possible. Concessions are awarded exclusively according to legally defined economic criteria, while criteria such as climate action have previously not been permitted.²³

According to the EnWG, gas distribution network operators must amortize the networks over 45 to 55 years.²⁴ Premature decommissioning leads to uncovered investment costs and requires value adjustments, leaving companies with stranded

assets on their balance sheets.²⁵ In Germany, 55 percent of the pipelines were built or renewed between 1990 and 2020; they would be only partially depreciated by 2045.²⁶ The Federal Network Agency (*Bundesnetzagentur*) has recognized the need to adjust the expected operating life and depreciation procedures and has begun a consultation process to do so.²⁷ This is an important step in advancing the decommissioning of the natural gas distribution network.

Heat planning process must be improved

The statutory obligation of heat planning creates a responsibility in the municipalities to coordinate the heat transition. In the interviews, however, various stakeholders pointed out that staffing levels are low in most municipalities and that the development of additional capacities is not sufficiently guaranteed due to low compensation funding for the heat planning. This can lead to a lack of continuity in heat planning and implementation as well as to knowledge asymmetries vis-a-vis non-municipal actors, thus leading to municipal interests being insufficiently represented.

In addition, in the planning process in Baden-Württemberg it is not mandatory to include key actors and the public;

²² Agora Energiewende, *Ein neuer Ordnungsrahmen für die Erdgasverteilnetze* (2023) (in German; available online).

²³ Julian Senders, "Wärmeplanung und Gaskonzessionen: Eine Untersuchung der bestehenden kommunalen Spielräume in der Wärmeplanung unter besonderer Berücksichtigung von Wärmenetzen," *Würzburger Studien zum Umweltenergie recht*, no. 27 (2022) (in German; available online).

²⁴ Section 46 of the EnWG.

²⁵ Veit Bürger et al., *Agenda Wärmewende 202. Studie im Auftrag der Stiftung Klimaneutralität und Agora Energiewende* (2021) (in German; available online).

²⁶ Ronny Lange, Agnes Schwigon, and Michael Steiner, "Bestands- und Ereignisdatenerfassung Gas – Ergebnisse aus den Jahren 2011 bis 2020," *energie | wasser-praxis* 12 (2021) (in German; available online).

²⁷ Bundesnetzagentur, *Eckpunkte zu den Abschreibungsmodalitäten für die Gasnetztransformation* (2024) (in German; available online).

accordingly, no funds are prescribed for such stakeholder consultations. In the interviews, civil society actors described the process as opaque due to the lack of participation opportunities. A major advantage of municipal heat planning is that both specialists and the general public can be involved, thereby creating acceptance for the transition at an early stage. Therefore, municipalities should be encouraged and supported as much as possible in exploiting this advantage.

Conclusion: Timely decommissioning of the network not yet guaranteed

The demand for natural gas for residential heating will decline over the next years. Natural gas distribution networks must be gradually decommissioned so that network charges do not become too expensive for the few remaining customers. Municipal heat planning is a first important step in accelerating the heat transition and is, in theory, a good instrument for planning the decommissioning of natural gas distribution networks. However, the evaluation of the first heat plans shows that the municipalities are ignoring the future of gas networks, citing major uncertainties. In addition, neither municipal nor private gas network owners have any economic interest in decommissioning, nor have there been any regulatory incentives to do so. The EnWG prioritizes cost efficiency and the obligation to connect over

climate action. However, climate action should be placed on equal footing with these other objectives in order to make it possible to decommission the gas distribution networks. The consultation on the future of the natural gas distribution networks launched by the German government in March 2024 and parallel processes at the Federal Network Agency are steps in the right direction.²⁸

Municipal owners are facing the same limitations due to regulations and a lack of economic incentives, which make decommissioning natural gas networks hard. The re-municipalization of gas networks that were previously privately owned is thus not a necessary prerequisite to making the heat supply climate-friendly. Municipalities and public utilities will need support services in the future to adequately compensate for the decline in the natural gas demand. Such support can include, for example, the development of new financing concepts for the provision of public services. In addition, municipalities should be encouraged to develop a clear roadmap for the existing natural gas distribution network infrastructure, even if this has not yet been explicitly required in the Heat Planning Act.

²⁸ Cf. Federal Ministry for Economic Affairs and Climate Action, *Green Paper Transformation Gas-/Wasserstoff-Verteilernetze* (2024) (in German; available online); Bundesnetzagentur, *Eckpunkte zu den Abschreibungsmodalitäten für die Gasnetztransformation*.

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LEGAL AND EDITORIAL DETAILS



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