

CONNECTING REALITY WITH CLIMATE GOALS: CASE STUDIES OF GAS DISTRIBUTION SYSTEM PLANNING AND REGULATION

Country Report Austria

Malte Bei der Wieden (Öko-Institut)

Veit Bürger (Öko-Institut)

Carmen Loschke (Öko-Institut)

Megan Anderson (RAP)

Sibylle Braungardt (Öko-Institut)

Tilman Hesse (Öko-Institut)

Marc Stobbe (Öko-Institut)

Jan Rosenow (RAP)



Background and objectives

- Fossil gas consumption in the EU must decline rapidly to meet energy and climate targets, as well as in the context of energy security concerns, and gas price volatility.
- Declining gas demand will lead to higher grid fees for remaining customers as fewer people use the gas infrastructure, with potential high increases of grid fees.
- Proposals to replace fossil gas with hydrogen face technical and economic challenges, with hydrogen being less efficient and more expensive for heating compared to electrification and district heating.
- Continued investment in gas infrastructure without a decommissioning plan risks stranded assets, as the long lifespans of gas grids do not align with decreasing gas usage and climate targets.
- Regulations are beginning to address these issues, with some countries taking steps towards orderly gas grid decommissioning to manage costs and transition to alternative energy sources efficiently.
- In view of these challenges ahead, the objectives of this country sheet are to
 - provide an overview the status quo of gas consumption and gas distribution networks
 - Outline how regulations related to the gas grid embrace this challenge and identify gaps
 - Highlight opportunities for stakeholders to interact in the process

Summary of the country report for Austria

- Gas is used widely in Austria, with gas making up for more around 23 percent of the total primary energy consumption of the country.
- The distribution gas grid is run by 21 gas distribution system operators (DSOs).
- Austria has no direct legislation that support the decommissioning of the gas grids:
 - At the end of 2023 a ban on the installation of gas boilers in new buildings was decided. Furthermore, financial support will incentivise the switch of existing gas boilers to more climate friendly heating systems.
 - Heat planning in Austria is currently part of spatial energy planning (Energieraumplanung). For spatial energy planning there is a lack of regulation on the federal level, resulting in a lack of standardisation across the country.
- At the same time, important challenges are ahead:
 - Network operators' scenarios in Austria are only partially consistent with the country's climate targets
 - The regulatory framework is not fit for the gas phase-out:
 - No ability to refuse new connections as well as disconnect existing customers from the gas network.
 - Long depreciation periods for past and future infrastructure investments leading to stranded assets.
 - No interlink between (gas) infrastructure planning with municipal heat planning.
- The next gas tariff regulation period starts in 2028. It is therefore advisable to make the recommended adjustments to the network regulation before then, with a focus on adapting the regulatory framework to facilitate the phase-out of gas. Especially integrating heat and grid planning as well as basing future gas infrastructure plans on realistic assumptions about the availability of zero-carbon heating technologies should be prioritised. In addition, assumptions on biomethane production and injection need to be reviewed to ensure that targets and assumptions are realistic.

Content and structure of the country report

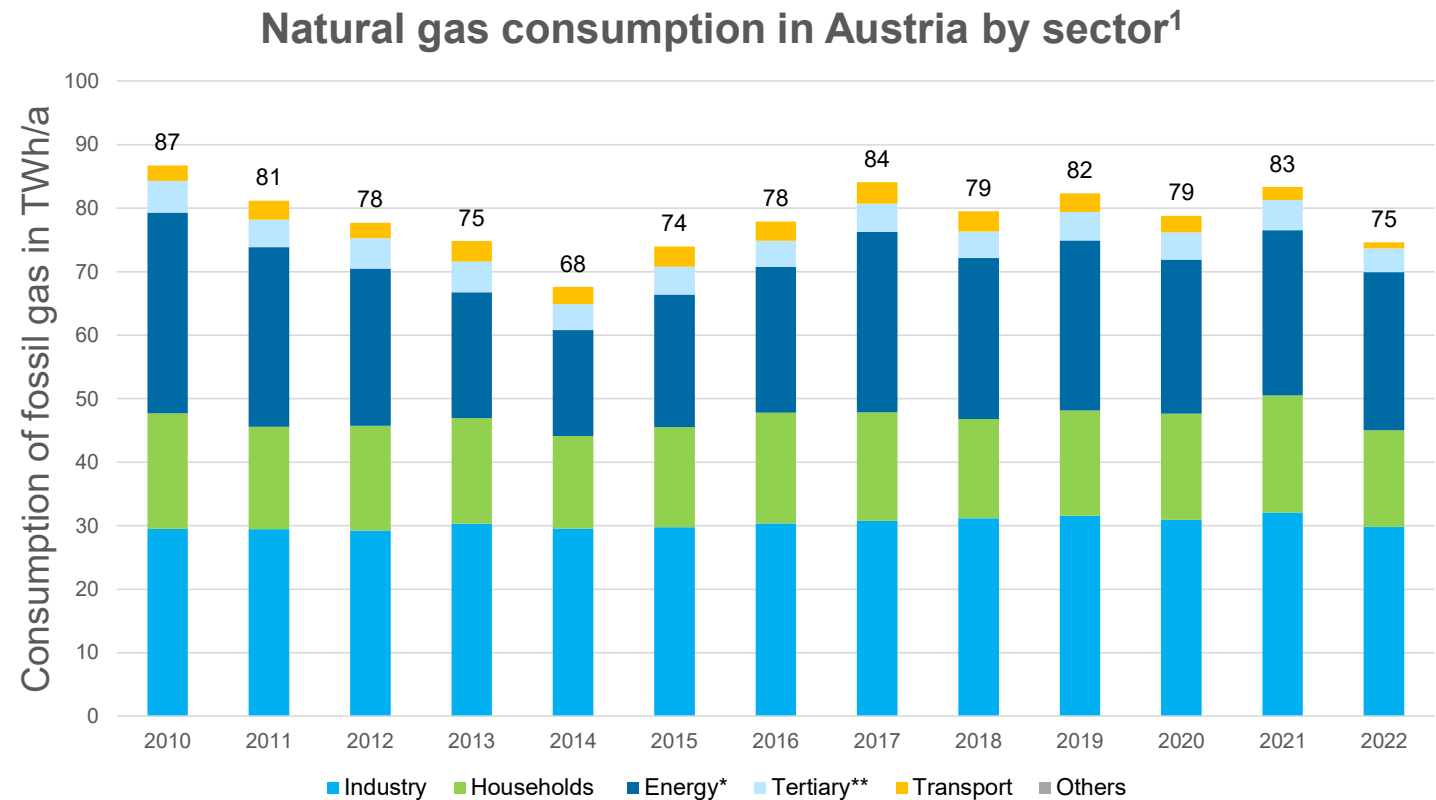
1. **Development of Fossil Gas Consumption + Heating Market/Systems:** This chapter provides an overview of historical trends and current statistics regarding fossil gas usage and the evolution of heating systems.
2. **Distribution Network - Development and Current State:** This section discusses the infrastructure that supports the distribution of gas, including an assessment of its development over time and its condition today.
3. **Network Regulation, Costs vulnerable and low-income Energy Users:** Here, we analyze the regulatory framework governing the distribution network and detail the associated costs of maintaining and expanding this infrastructure.
4. **Current and Anticipated Role of Alternative Gases:** This chapter evaluates the expected role of alternative gases like biogas and hydrogen in transitioning away from fossil fuels, including current applications and future projections.
5. **Alignment with Climate Scenarios:** We explore how gas grid planning is aligned with national climate goals, examining scenarios that aim to reduce greenhouse gas emissions.
6. **Transparency of Information and Stakeholder Input:** The final section discusses transparency and highlights opportunities for stakeholder engagement.

Content

- 1** Development of fossil gas consumption + heating market/systems
- 2** Distribution Network - Development and Current State
- 3** Network Regulation, Costs and vulnerable and low-income Energy Users
- 4** Current and anticipated role of Alternative Gases
- 5** Alignment with Climate Scenarios
- 6** Transparency of Information and Opportunities for stakeholder involvement

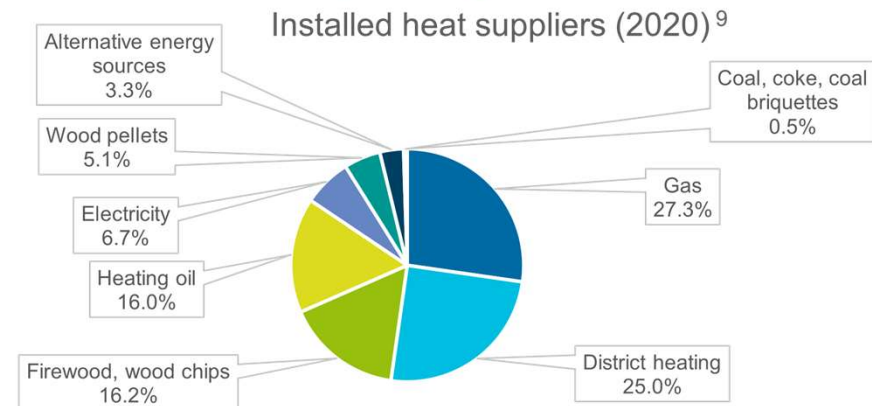
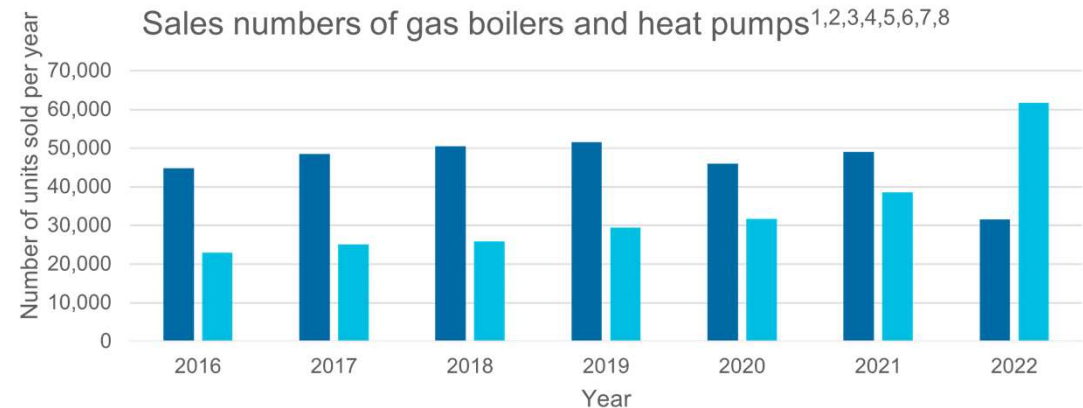
Development of fossil gas consumption – Eurostat Data

- Total fossil gas consumption in Austria has been stable at around 80 TWh per year.
- Most of the gas is consumed by industry and the energy sector. Their combined consumption was around 55-60 TWh/a in the last decade.



Development of heating systems

- In recent years, the sales figures for gas boilers in Austria have been relatively constant at around 50,000 new boilers per year. In 2022 however, these numbers have dropped significantly to around 30,000.^{1,2,3,4,5,6,7}
- For heat pumps, there is a constant increase from 2016 to 2021 from just over 20,000 to around 40,000. In 2022, sales jumped to over 60,000.⁸
- The reason for this is possibly the development of gas prices due to the war in Ukraine.
- Overall, however, gas boilers still had a share of about 27 % of heat generators in 2020. Fossil gas was also the energy source for 34 % of the district heating networks.⁹
- *For other heat generators, there is a lack of data to make the market sales comparable.

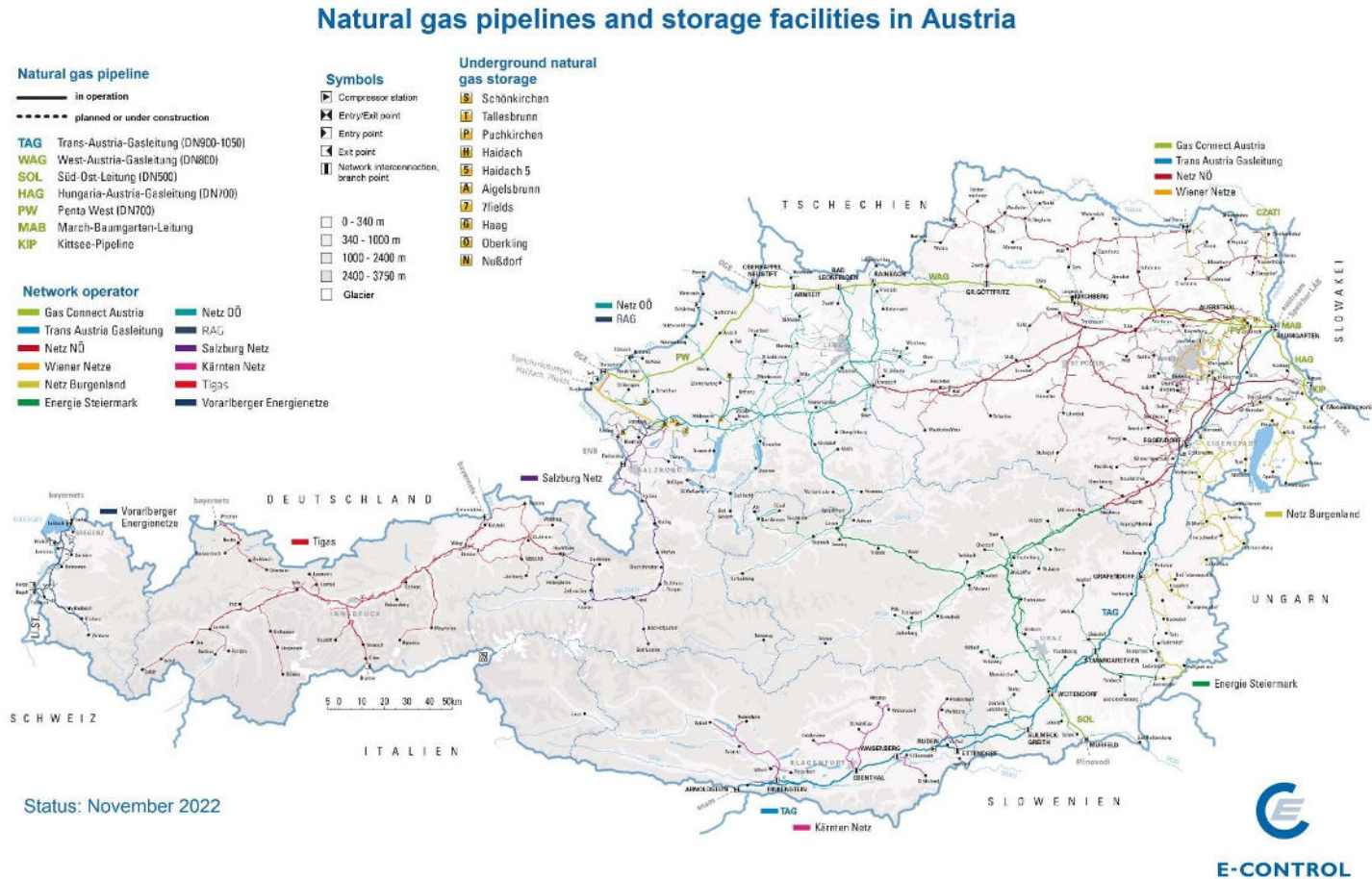


Content

- 1** Development of fossil gas consumption + heating market/systems
- 2** Distribution Network - Development and Current State
- 3** Network Regulation, Costs and vulnerable and low-income Energy Users
- 4** Current and anticipated role of Alternative Gases
- 5** Alignment with Climate Scenarios
- 6** Transparency of Information and Opportunities for stakeholder involvement

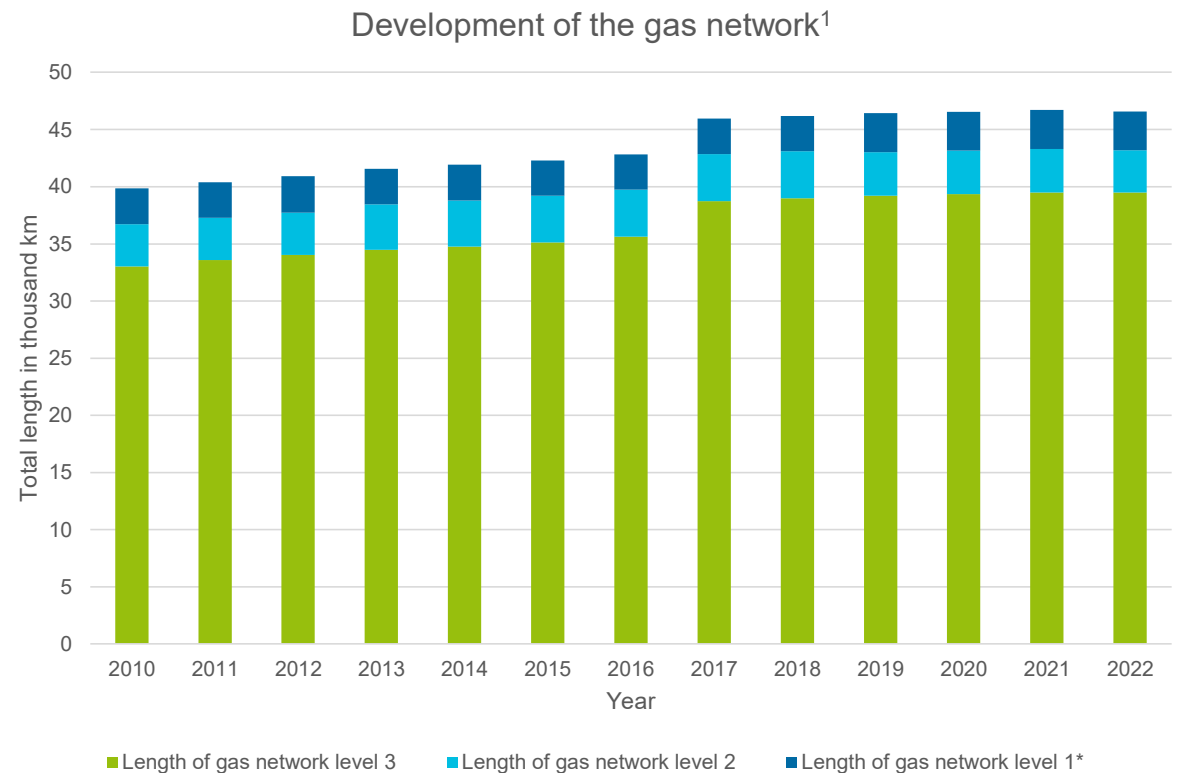
Map of the network operators (Status November 2022)

- A total of 21 distribution system operators (DSOs) and 3 transmission system operators (TSOs) are involved in the Austrian gas grid.¹
- The map shows 12 of the 21 DSOs. According to E-Control, it only gives an overview of larger pipelines (transmission, level 1 and level 2).²
- The network shows the central importance of the area around Vienna and the distribution from this hub across the whole country.²



Development of the gas transmission and distribution network

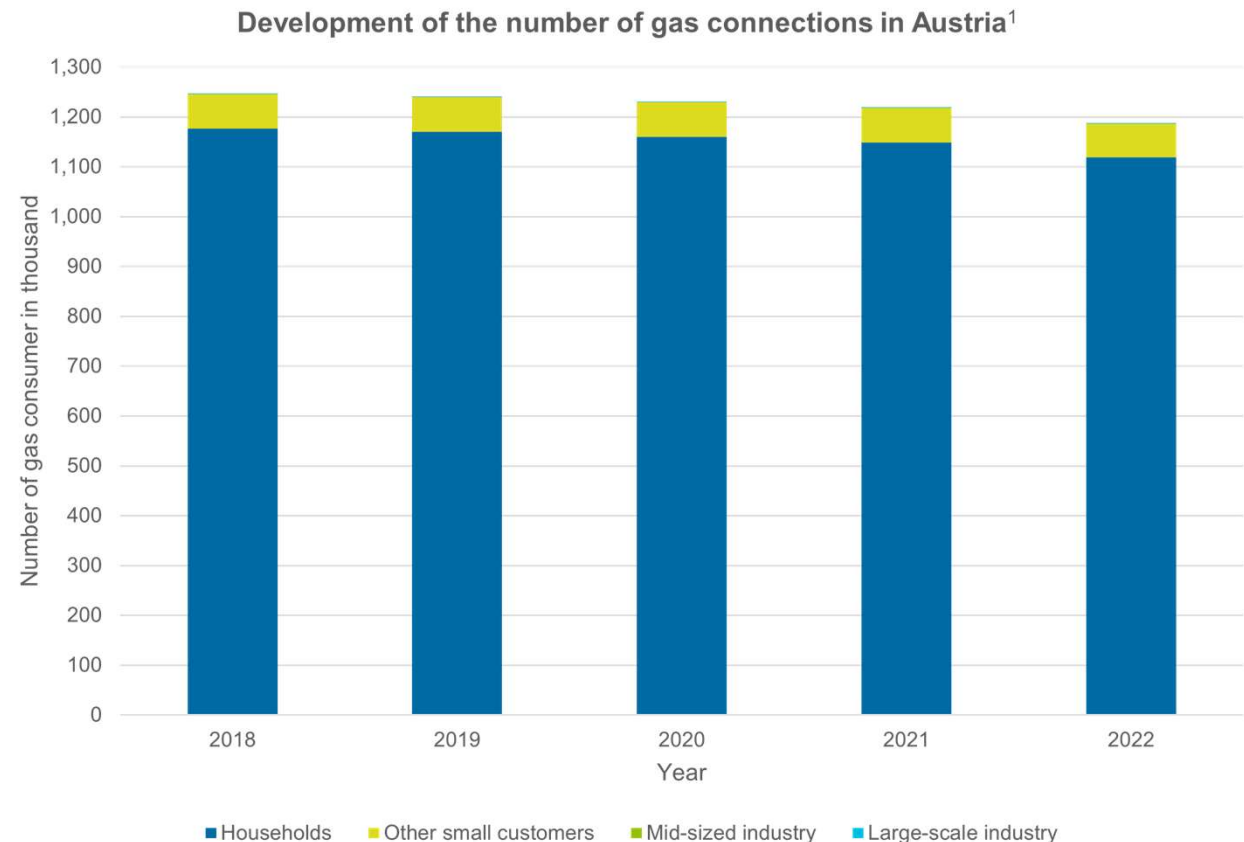
- The Austrian gas grid has a total length of about 46.6 thousand km with almost 1.2 million consumption points connected to the grid.¹
- The Austrian gas grid is divided into long-distance pipelines for the transport of fossil gas through high-pressure transmission pipelines and level 1 distribution pipelines for interregional gas flow control and levels 2 (> 6 bar) and 3 (≤ 6 bar) for direct supply to end users.¹
- From 2010 to 2017, the total length of the network has grown from 40 to around 46 thousand km. From 2017 onwards, the network has hardly grown any further.¹



*includes transmission pipelines

Development of the gas transmission and distribution network

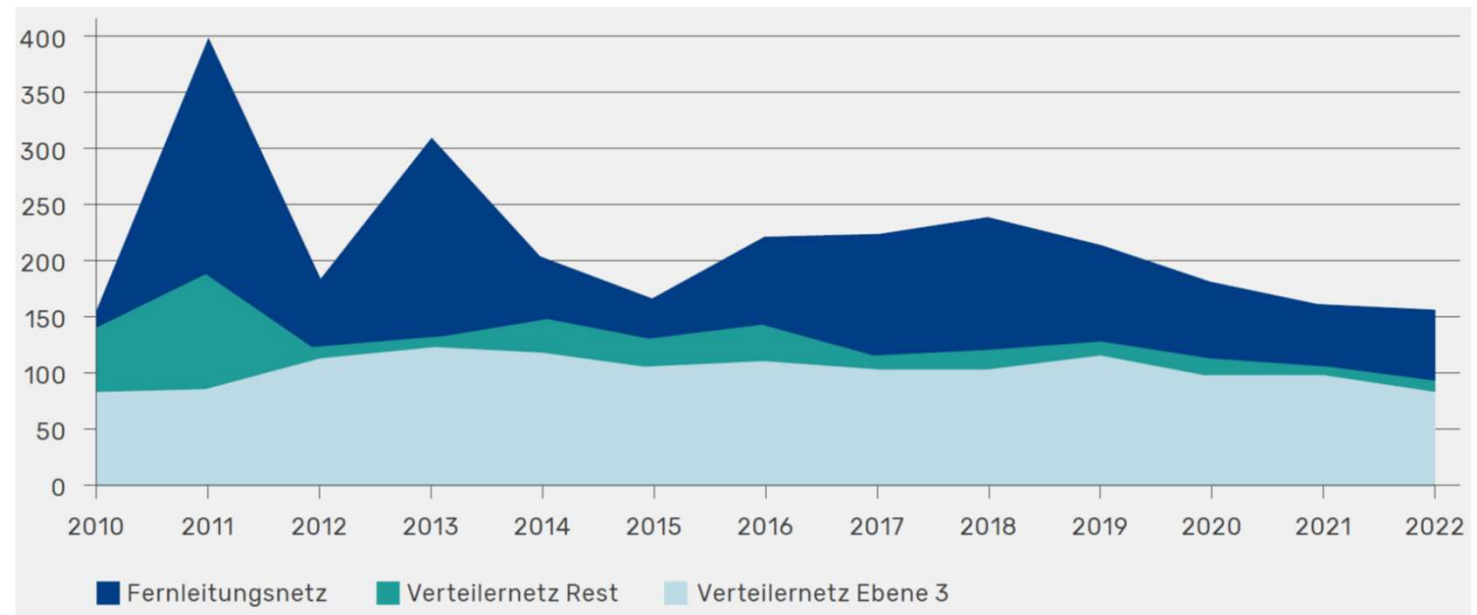
- Even though the total length of the grid has been stable (see previous slide), the number of consumption points connected to the grid fell by around 70,000 from 1.25 million in 2018 to 1.18 million consumption points in 2022.¹
- This reduction resulted primarily from disconnecting households, while the other consumer groups were responsible for a constant number of connection points.¹



Investments in gas networks

- Annual investments in the gas infrastructure have been relatively stable until 2019, with investments in the transmission network fluctuating year by year.¹
- After 2019 there is a slight reduction trend in investments, especially for the distribution grid level 3.

Annual investments in the Austrian gas infrastructure (Mio. EUR)¹



Content

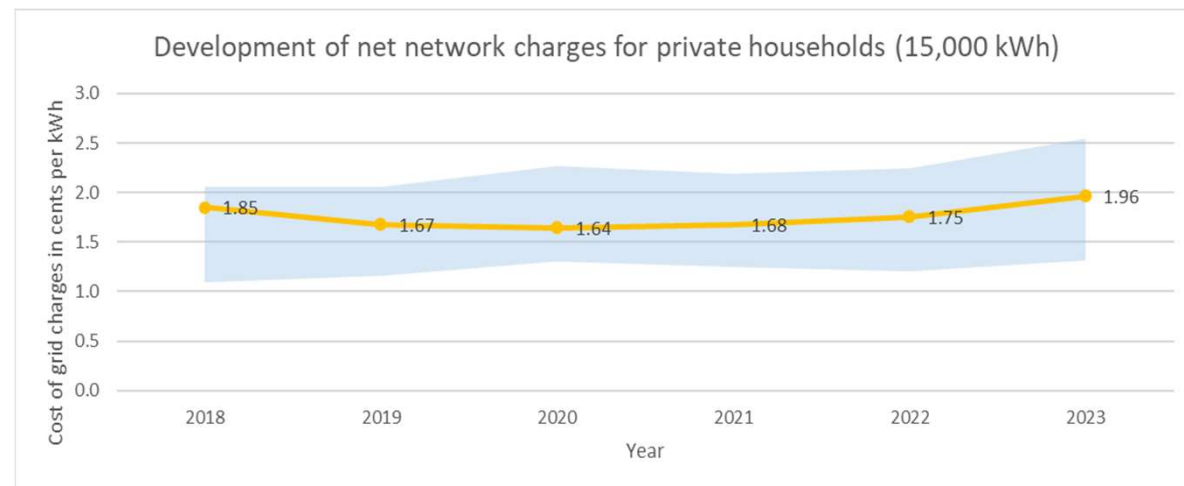
- 1** Development of fossil gas consumption + heating market/systems
- 2** Distribution Network - Development and Current State
- 3** Network Regulation, Costs and vulnerable and low-income Energy Users
- 4** Current and anticipated role of Alternative Gases
- 5** Alignment with Climate Scenarios
- 6** Transparency of Information and Opportunities for stakeholder involvement

Gas grid regulation

- Network development: Separate network development plans exist for the transmission grid (Koordinierter Netzentwicklungsplan für die Gas-Fernleitungsinfrastruktur) and the distribution grid (Langfristige und integrierte Planung für die Gas Verteilernetzinfrastruktur).¹ Forecasts for future demand of gaseous fuels, including natural gas, hydrogen, and biomethane, are prepared for network planning. The forecasts for natural gas reflect Austria's climate targets. The current development plan (2023-2040) assumes a 90% decrease in natural gas demand by 2040 for private households. However, the plan does not specify to which extent this demand will be replaced by biomethane or hydrogen.
- Network regulation: The Gas Act (GWG) regulates the network access conditions, operating requirements for network operators, obligations of DSOs and TSOs, the procedure for setting grid charges and other aspects in the gas sector.² Within their grid area distribution grid operators are obliged to connect customers on request. This may involve laying new gas pipelines in the ground if necessary. The grid operator may only decline the connection if it is not economically viable. In the event of disputes, the provincial governor decides at the request of one of the parties.
- Grid charges: The GWG regulates the determination of grid charges using a cost-plus approach. Grid charges are regulated by E-Control (regulatory authority). In 2023 grid charges made up approximately 11% of the total gas price for residential customers.²
- Depreciation: To determine the grid charges, the investments in the pipelines are amortised over a period of 30-40 years (PVC pipes 30 years, other materials 40 years).³ In 2021, the residual value of the distribution grid lines that have not yet been amortised was approximately EUR 2.3 billion.⁴ Nothing is known about the extent to which network operators are allowed to shorten the depreciation periods in order to be able to fully depreciate a pipeline in the event of earlier decommissioning.

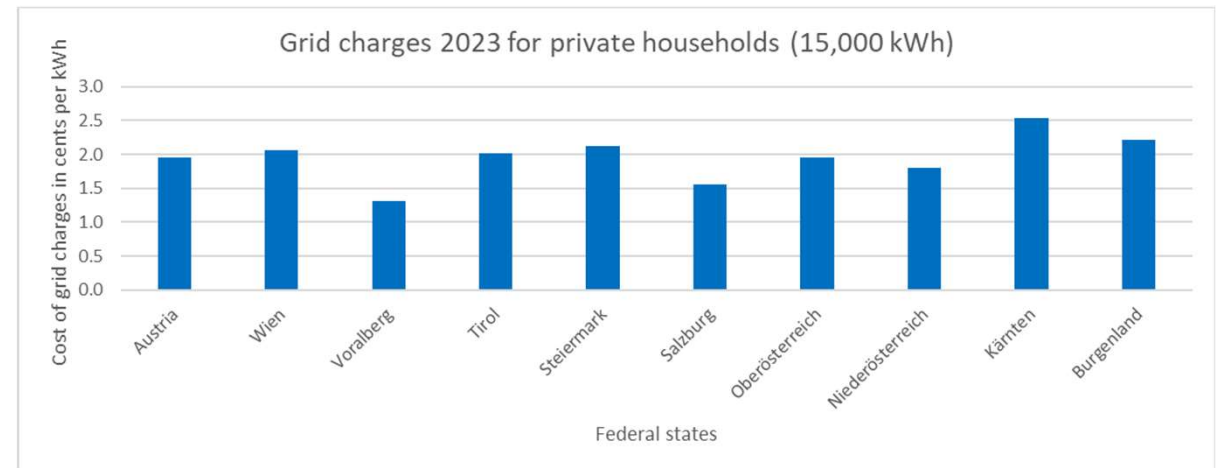
Gas grid charges

- To determine the grid charges, the gas network operators record all costs associated with the operation of the gas networks. This includes expenses for new developments, maintenance, repairs, meter readings, administration and operation. By law they have the right to recover these costs, as well as an appropriate return, through the grid charges.⁷
- E-Control checks the costs for appropriateness and accuracy. It then calculates the charges for each network area that the network operator is entitled to charge its customers.
- The average gas grid charges have fallen slightly from 1.85 cents/kWh in 2018 to 1.64 cents/kWh in 2020 before rising again: In 2023, they reached 1.96 cents/kWh for a typical private household with a consumption of 15,000 kWh.^{1,2,3,4,5,6}
- It is currently unknown how grid charges would be affected if certain parts of the distribution grid were decommissioned due to the natural gas phase-out.



Gas grid charges

- Grid charges for private households vary significantly depending on the region. In Vorarlberg, grid charges are as low as 1.3 cents/kWh, in Kärnten they reach up to 2.54 cents/kWh.^{1,2,3,4,5,6}
- The cost differences between federal states can be explained by individual distribution network costs, the fixed revenue caps and the different number of customers in the different network areas.^{1,2,3,4,5,6}



Heat planning and gas boiler regulations

- Heat planning: Heat planning in Austria is currently part of spatial energy planning (Energieraumplanung). Spatial energy planning considers not only the heating sector, but also all forms of energy supply and use. However, for spatial energy planning there is a lack of regulation on the federal level, resulting in a lack of standardisation across the country. Responsibility and initiative currently lie with individual federal states (Bundesländer). Municipal heat planning and spatial energy planning are being trialled as a pilot project in Styria, Vienna, and Salzburg, with several project partners.^{1,2}
- Gas boiler regulations³
 - In 2023, a proposal was discussed regarding the decommissioning of existing gas boilers. The proposal suggested that gas boilers in existing buildings should be decommissioned by mid-June 2040 at the latest. Heating system operators would have until 2040 to switch from fossil fuels to alternative energy sources. It was noted that systems operated with renewable gases could continue to be used beyond 30 June 2040. A requirement for heating system centralisation was proposed for multi-family houses with individual flat heating systems.
 - At the end of 2023, however, "only" a ban on the installation of gas boilers in new buildings was decided.³ Financial support will incentivise the switch of existing gas boilers to more climate friendly heating systems, rather than a regulatory phase-out.
 - There is no legal connection between the regulatory framework for fossil fuel boilers and the subsidy regime for climate-friendly heating systems and heat planning.

Addressing vulnerable energy consumers and broader social justice concerns

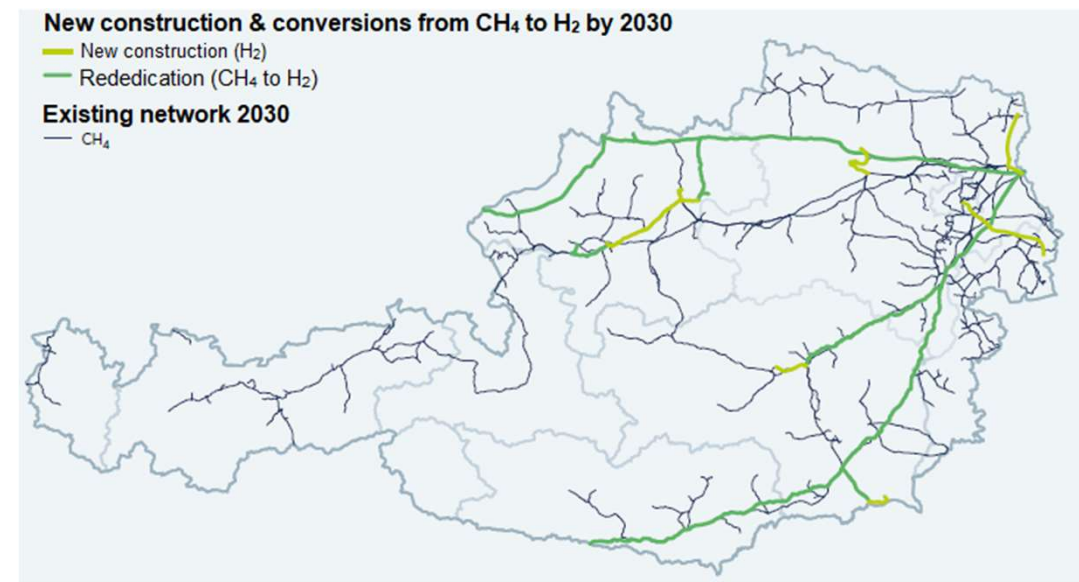
- There are several policies in place to protect vulnerable energy consumers against high energy costs, such as:
 - A subsidy programme (“Sauber Heizen für Alle”) for new installations of efficient renewable heating systems with subsidy rates of 100% for low-income (20% lowest) owners of houses¹
 - A temporary reduction of the natural gas levy (“Erdgasabgabe”)²
- Nevertheless, the concerns of vulnerable households are not specifically included in the process of infrastructural planning.
- Reasons why consumers are vulnerable:
 - Low Income: Households with limited financial resources struggle to afford high energy costs.
 - Energy Inefficiency: Older homes and inefficient heating systems result in higher energy consumption and costs.
 - The EU-Silc defines vulnerability as income below 60% of the national median income.³

Content

- 1** Development of fossil gas consumption + heating market/systems
- 2** Distribution Network - Development and Current State
- 3** Network Regulation, Costs and vulnerable and low-income Energy Users
- 4** Current and anticipated role of Alternative Gases
- 5** Alignment with Climate Scenarios
- 6** Transparency of Information and Opportunities for stakeholder involvement

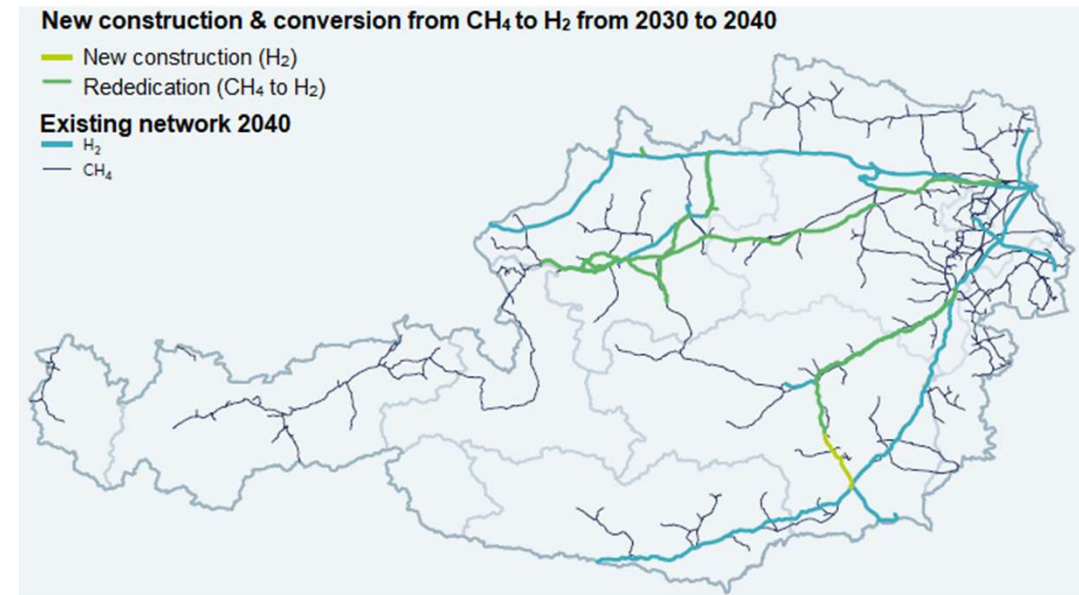
Hydrogen

- Hydrogen is an integral part of the future energy system in Austria. The Federal Ministry for Climate Protection, Environment, Energy, Mobility, Innovation and Technology (BMK) has modelled the Austrian gas network as well as the hydrogen network. The modelling considered all planned projects from the coordinated network development plan (KNEP) and the long-term integrated planning (LFiP) up to and including 2022.¹
- The figure on the right shows the modelling results for the hydrogen infrastructure in 2030.¹ The H₂ network is either newly constructed or set up by rededicating parts of the existing gas grid.
- Forecast hydrogen demand by 2030: 24 TWh/a ²



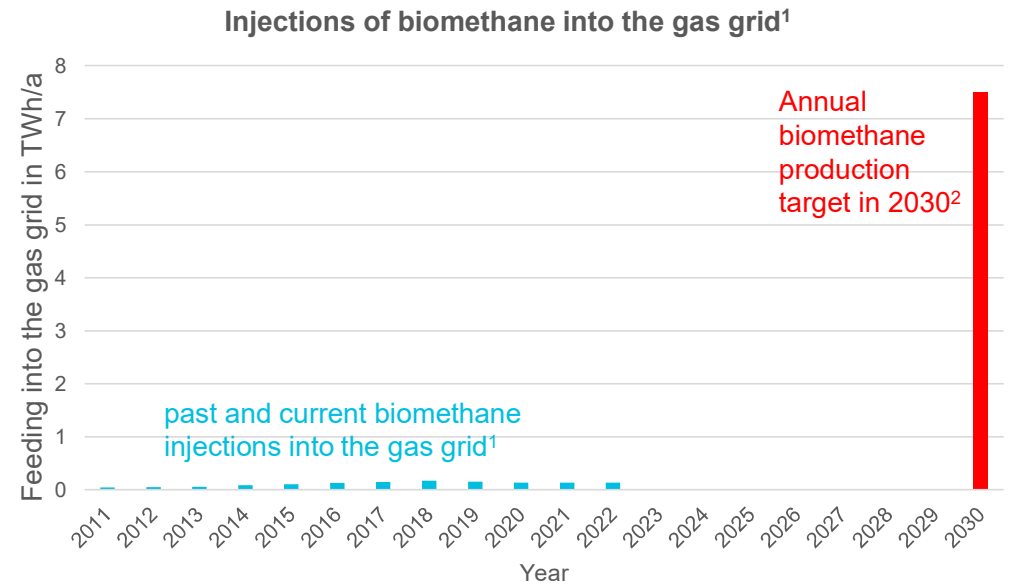
Hydrogen

- In 2040, it is assumed that 10.7 TWh of biomethane from Austrian generation plants will be fed into the gas grid. Most of the remaining gas demand in 2040 will be covered by hydrogen according to the transition scenario.¹
- A large part of the existing methane network structure, especially in western Austria, will be used in the future to tap the national biomethane potentials.¹
- The resulting hydrogen infrastructure as well as the necessary rededications and new constructions in 2040 are visualised in the map on the right.¹
- Forecast hydrogen demand by 2040: 51 TWh/a ²



Biomethane

- The upgrading of biogas to biomethane and subsequent injection into the Austrian gas grid has increased in recent years, peaking at around 170 GWh/a in 2018 and remaining at just under 140 GWh/a from 2019 to 2022.¹
- This means that biomethane has a share of around 0.16% of total fossil gas consumption from the gas grid in Austria in 2022.¹
- The Renewable Gas Act sets a clear target for green gas production in Austria. A mandatory quota model is to ensure that there is a corresponding supply in the market. By 2030, a total of at least 7.5 TWh of domestic biomethane are to be produced annually. Suppliers must reach a mandatory quota of 7.7% by 2030 (cf. table on the right). Biomethane production in Austria is to be increased more than fifty-fold from a current level of 0.14 TWh to 7.5 TWh over the next seven years.²



Mandatory share of biomethane (planned in the EGG draft)²

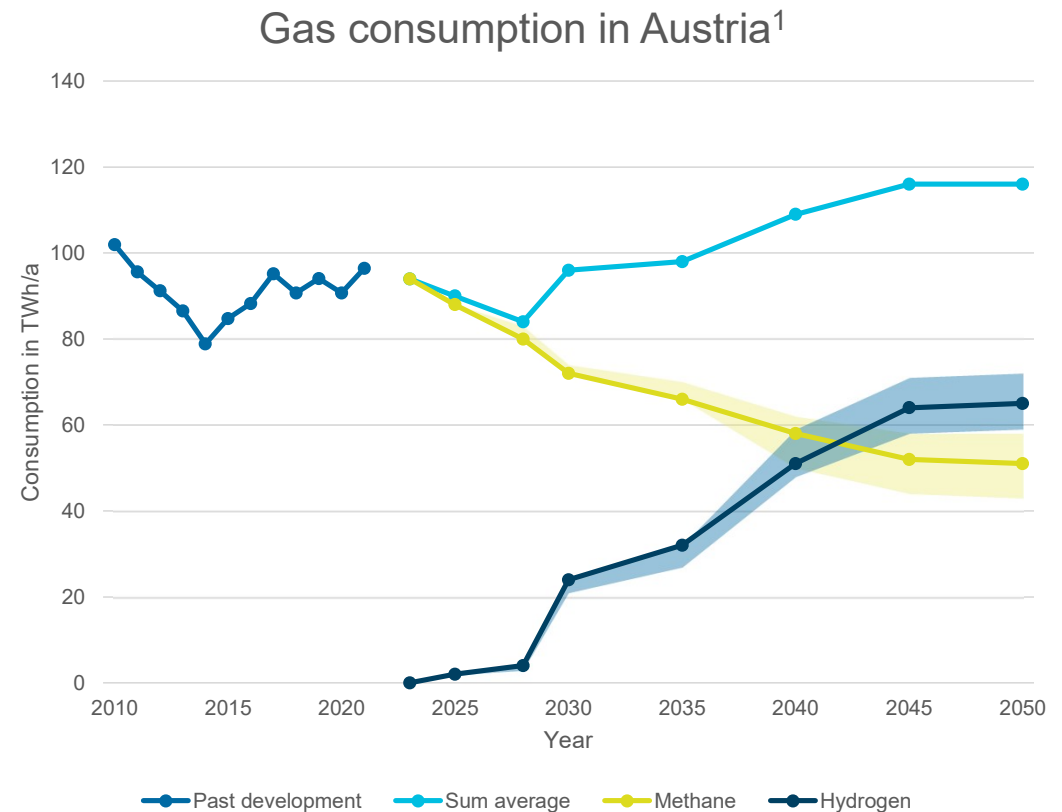
Year	2024	2025	2026	2027	2028	2029	2030
Share	0.70%	1.05%	1.75%	2.80%	4.20%	5.95%	7.70%

Content

- 1** Development of fossil gas consumption + heating market/systems
- 2** Distribution Network - Development and Current State
- 3** Network Regulation, Costs and vulnerable and low-income Energy Users
- 4** Current and anticipated role of Alternative Gases
- 5** Alignment with Climate Scenarios
- 6** Transparency of Information and Opportunities for stakeholder involvement

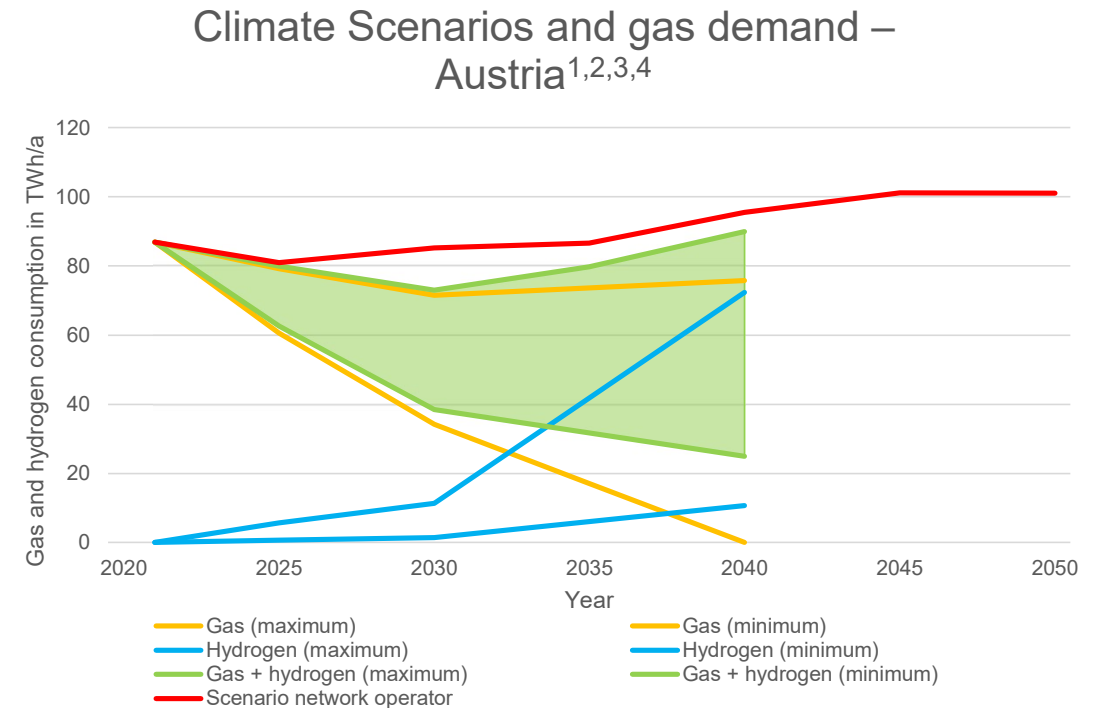
Climate Scenarios and fossil gas demand

- In order to achieve the climate targets, the consumption of fossil gas must be completely phased out by 2040 and, as a study shows², can only partially be replaced by green gases.
- The Austrian Gas Grid Management AG (AGGM) monitor the gas market and coordinates distribution areas. AGGM prepare two gas grid development plans every two years: the Coordinated Network Development Plan (KNEP) and the Long-term and Integrated Planning (LFiP). These plans form the basis for the future gas infrastructure in Austria. They include strategies for improving existing infrastructure and securing supply.¹
- The AGGM's LFiP 2022 describes the gas demand determined until 2050 by means of queries to the network operators. The forecasts foresee increasing hydrogen demand and decreasing methane demand. By 2040, the methane demand is estimated at approx. 60 TWh, while the hydrogen demand increases to just under 50 TWh. Total gaseous energy demand is projected at about 100 TWh by 2030 and to further increase to just below 110 TWh by 2040.¹



Climate Scenarios and gas demand

- There are several studies on the future development of fossil gas and hydrogen demand in Austria, that take climate targets into consideration. The figure shows the corridor of the projected future development of gas and hydrogen demand in Austria as well as the assumptions of the gas network operators (red line).
- The climate scenarios show a remarkable diversity in the expected demand for gas and hydrogen. Some scenarios emphasise electrification, while others prioritise the introduction of green gases and hydrogen as key components to achieve decarbonisation. The network operators' line is slightly higher than the upper limit projected in the climate scenarios.
- The grid operators' plan does not seem to be in line with national emission reduction targets. The discrepancy between the expected demand in the network development plan and the climate scenarios raises concerns about consistency with the overarching climate targets.



Future gas and hydrogen demand in Austria based on different scenarios that aim to achieve the climate targets of the country and projected developments of the gas network operators. (The values in the green corridor do not correspond solely to the sum of the maximum values for gas and hydrogen. Instead, the green corridor represents the range of the total sum of hydrogen and gas within the same scenario for different scenarios. Included scenarios: AGGM, TUW – Electrification, TUW - Green Gases, TUW - Green methane, TUW - Decentralised green gases, ÖNIP and UBA-Transition^{1,2,3,4})

Content

- 1** Development of fossil gas consumption + heating market/systems
- 2** Distribution Network - Development and Current State
- 3** Network Regulation, Costs and vulnerable and low-income Energy Users
- 4** Current and anticipated role of Alternative Gases
- 5** Alignment with Climate Scenarios
- 6** Transparency of Information and Opportunities for stakeholder involvement

Public information

- AGGM prepare two gas grid development plans every two years: the Coordinated Grid Development Plan (KNEP) and the Long-term and Integrated Planning (LFIIP). These plans form the basis for the future gas infrastructure in Austria. They contain strategies for improving the existing infrastructure and securing supply.^{1,2,3}
- As provided for in the Renewable Energy Expansion Act (EAG), the Federal Ministry for Climate Protection, Environment, Energy, Mobility, Innovation and Technology (BMK) is for the first time preparing an integrated Austrian Grid Infrastructure Plan (NEP). This comprehensive plan serves as a strategic tool that provides a holistic perspective on the future demands on the different infrastructures of the energy system. It outlines the necessary energy infrastructure for the energy transition and forms the basis for the expansion and restructuring of the energy transmission infrastructure by 2030 as well as for achieving climate neutrality by 2040. By simultaneously considering higher-level concerns of energy transmission for electricity and gas, including hydrogen, the BMK aims to facilitate the synchronisation of the expansion of renewable energies with grid expansion as well as with storage and flexibility solutions.⁵
- According to §61 of the Gas Industry Act (GWG), DSOs are obliged to advise end consumers whose customer system is connected to their network about energy-saving measures in general and about possibilities for saving and using gas efficiently in particular.⁴
- Maintenance work is communicated on individual DSO's web pages, which provide information on the entire managed network. For network development, reference is made to the network development plan of all network operators in cooperation with AGGM and the transmission system operators.^{6,7}

Opportunities for stakeholder involvement

- The next gas tariff regulation period starts in 2028.¹ It is therefore advisable to make the recommended adjustments to the network regulation before then, with a focus on adapting the regulatory framework to facilitate the phase-out of gas. Especially integrating heat and grid planning as well as basing future gas infrastructure plans on realistic assumptions about the availability of zero-carbon heating technologies should be prioritised. In addition, assumptions on biomethane production and injection need to be reviewed to ensure that targets and assumptions are realistic. In Austria regulatory changes should address the following points:
 1. Enable the ability to refuse new connections as well as disconnect existing customers from the gas network.
 2. Shorten depreciation periods for past and future infrastructure investments to avoid stranded assets and spread decommissioning costs evenly over a shorter period, ensuring full payback by the time the network is decommissioned.
 3. Cover foreseeable decommissioning costs through network tariffs or funding mechanisms, while building up a reserve for future decommissioning to spread the financial burden and protect consumers from excessive costs.
 4. Interlink (gas) infrastructure planning with municipal heat planning.
 5. Incorporate climate scenarios into infrastructure planning to avoid unnecessary costs and investments.

List of sources

- AGCS Gas Clearing and Settlement AG (2023): Statistics - Biomethane Injection in Austria. Available online at <https://www.biomethanregister.at/de/statistik>
- Association of Austrian Boiler and Heating Manufacturers (VÖK) (2023): Market Figures 2022. Available online at <https://tga.at/branche/klimaerwaermung-wer-braucht-da-eine-heizung/>
- Association of Austrian Boiler and Heating Manufacturers (VÖK) (2022): Heating Market 2021 - Significant Growth in High-Efficiency Heating Systems. Available online at https://www.ots.at/presseaussendung/OTS_20220104_OTS0070/heizungsmarkt-2021-deutliches-wachstum-bei-hocheffizienten-heizsystemen
- Association of Austrian Boiler and Heating Manufacturers (VÖK) (2021): Sales of Heating Boilers Up Compared to the Previous Year. Available online at https://www.heizungs.org/get/CmsService/getFile/1611200533620/0/20210121_Presseaussendung_Markt2020.pdf
- Association of Austrian Boiler and Heating Manufacturers (VÖK) (2020): We Are the Heat Transition! Available online at https://www.heizungs.org/get/CmsService/getFile/1583811354136/0/20200304_Presseaussendung_Wels.pdf
- Association of Austrian Boiler and Heating Manufacturers (VÖK) (2019): Austria Consumes Too Much Energy! Available online at https://www.heizungs.org/get/CmsService/getFile/1551066898694/0/Heizungsmarkt_2018.pdf
- Association of Austrian Boiler and Heating Manufacturers (VÖK) (2018): The Austrian Heating Market Achieves Slight Growth in 2017. Available online at <https://www.pelletshome.com/pellets-news/der-oesterreichische-heizungsmarkt-erzielt-2017-ein-leichtes-plus>
- Association of Austrian Boiler and Heating Manufacturers (VÖK) (2017): Austrian Heating Industry Announces Boiler Sales for 2016. Available online at <https://www.pelletshome.com/pellets-news/oesterreichische-heizungsbranche-gibt-kesselabsatz-2016-bekannt>
- Austrian Gas Grid Management AG (AGGM) (2023a): Long-Term and Integrated Planning 2022 - for the Gas Distribution Network Infrastructure in Austria for the Period 2023 - 2040. Available online at https://www.aggm.at/fileadmin/AGGM/Bilder-Dokumente/Energiewende/H2_Roadmap/LFiP-2022.pdf
- Austrian Gas Grid Management AG (AGGM) (2023b): Network Planning - Planning & Optimization of Gas Networks. Available online at <https://www.aggm.at/gasnetz/netzplanung/>
- Austrian Gas Grid Management AG (AGGM) (2022): Coordinated Network Development Plan 2022 - for the Gas Transmission Infrastructure in Austria - for the Period 2023 – 2032. Available online at <https://www.aggm.at/fileadmin/AGGM/Bilder-Dokumente/Gasnetz/Netzplanung/AGGM-KNEP22.pdf>
- Biermayr, P.; Aigenbauer, S.; Dißauer, C.; Eberl, M.; Enigl, M.; Fechner, H.; Fink, C.; Fuhrmann, M.; Hengel, F.; Jaksch-Fliegenschnee, M.; Leonhartsberger, K.; Matschegg, D.; Moidl, S.; Prem, E.; Riegler, T.; Savic, S.; Schmid, C.; Strasser, C.; Wonisch, P.; Wopienka, E. (2023): Innovative Energy Technologies in Austria - Market Development 2022. Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation, and Technology (BMK). Available online at https://nachhaltigwirtschaften.at/resources/iea_pdf/schriftenreihe-2023-36a-marktstatistik-2022.pdf
- Bundesministerium der Finanzen (BMF) (2022): Maßnahmen zur Abfederung der hohen Energiekosten. Online available at <https://www.bmf.gv.at/public/informationen/energiekosten-abfederung.html>
- BMNT - Bundesministerium für Nachhaltigkeit und Tourismus and BMVIT - Bundesministerium für Verkehr, Innovation und Technologie (2018): #mission 2030, Die österreichische Klima- und Energiestrategie. Bundesministerium für Nachhaltigkeit und Tourismus and Bundesministerium für Verkehr, Innovation und Technologie (ed.). Wien. Online available at https://www.bundeskanzleramt.gv.at/dam/jcr:903d5cf5-c3ac-47b6-871c-c83eae34b273/20_18_beilagen_nb.pdf

List of sources

- Eurostat (2022a): Complete energy balances. DOI: 10.2908/nrg_bal_c. Available online at https://ec.europa.eu/eurostat/databrowser/view/nrg_bal_c_custom_11396776/bookmark/table?lang=en&bookmarkId=64535145-5172-4804-b176-ba06dfe39e61
- Eurostat (2022): EU statistics on income and living conditions, Eurostat. Available online at <https://ec.europa.eu/eurostat/web/microdata/european-union-statistics-on-income-and-living-conditions>
- Eurostat (2023): Complete energy balances. DOI: 10.2908/nrg_bal_c. Available online at <https://ec.europa.eu/eurostat/databrowser/bookmark/64535145-5172-4804-b176-ba06dfe39e61?lang=en>
- E-Control (2023a): Natural Gas Consumption in Austria. Available online at https://www.e-control.at/statistik/g-statistik/charts/gas07_str
- E-Control (2023b): Natural Gas - Inventory Statistics, Transmission and Distribution Lines, Length of Lines as of December 31 - Yearly Data. Available online at https://www.e-control.at/documents/1785851/1811798/BeStErdGas-JR1_Netz.xlsx
- E-Control (2023c): Consumer Structure. Available online at https://www.e-control.at/documents/1785851/1811624/MStErdGas-2022_JJ1Ver.xlsx
- E-Control (2022a): Gas DSO regulatory regime for the fourth regulatory period - 1 January 2023 – 31 December 2027. Available online at <https://www.e-control.at/documents/1785851/0/Regulatory+regime+for+the+fourth+regulatory+period+GAS.pdf/f036510b-f87b-5bb8-83a9-7d7ee06acdbd?t=1698924472231>
- E-Control (2022b): Natural Gas Lines and Natural Gas Storage in Austria. Available online at https://www.e-control.at/documents/1785851/1811027/GasNetzKarte_2022-e-control_V2.jpg
- E-Control (2022c): New Gas Network Tariffs for 2023 - Gas network tariffs are increasing in most network areas, except for Tyrol. Available online at <https://www.e-control.at/documents/1785851/0/E-Control%2C+Neue+Gasnetzentgelte+f%C3%BCr+2023.pdf/1e0486ed-a986-4f01-2927-093ef75295bd?t=1677147327445>
- E-Control (2022d): Price Composition – Gas Price Composition. Available online at <https://www.e-control.at/konsumenten/strom-gas-preise>
- E-Control (2021): New Gas Network Tariffs for 2022 - Gas network tariffs are slightly increasing for 2022. There are regional variations in changes. Available online at https://www.ots.at/presseaussendung/OTS_20211221_OTS0081/e-control-neue-gasnetzentgelte-fuer-2022-bild
- E-Control (2020): New Gas Network Tariffs for 2021 - Reductions and Increases Largely Balanced Nationwide – New Fees for Gas Transmission Network Operators. Available online at https://www.e-control.at/presseaussendungen-2020/-/asset_publisher/Pp5glo1ViF0r/content/e-control-neue-gasnetzentgelte-fur-2021
- E-Control (2019): Electricity and Gas Network Fees for Households 2020. Available online at https://www.e-control.at/newsletter-1/2020/-/asset_publisher/i7VYxG7Z1weE/content/strom-und-gasnetzentgelte-fur-haushalte-2020
- E-Control (2018): Gas Network Fees for 2019 Bring Further Relief. Available online at https://www.e-control.at/presseaussendungen-2018/-/asset_publisher/Da0W8QKmR58A/content/e-control-gasnetzentgelte-fur-2019-bringen-erneut-entlastungen
- E-Control (2017): New Gas Network Tariffs for 2018 Bring Relief. Available online at https://www.e-control.at/documents/1785851/1811582/E-Control_+Neue+Gasnetzentgelte+f%C3%BCr+2018+bringen+Entlastungen.pdf/a655e248-35b1-940d-74ba-f18ecb1a9195?t=1524239744569
- E-Control: How are the grid fees determined? Available online at <https://www.e-control.at/konsumenten/wie-werden-die-netzentgelte-festgelegt>

List of sources

- Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation, and Technology (BMK) (2023a): Integrated Austrian Network Infrastructure Plan – Draft for Comments. Available online at <https://news.wko.at/news/oesterreich/0077-hue-oenip-2023.pdf>
- Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation, and Technology (BMK) (2023b): Ministerial Draft - Federal Law on the Introduction of an Obligation for Supply of Gas from Renewable Sources (Renewable Gas Act – EGG). Available online at https://www.parlament.gv.at/dokument/XXVII/ME/251/fname_1521315.pdf
- Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation, and Technology (BMK) (2023c): Evaluierung des Förderprogramms „Sauber heizen für Alle“. Available online at https://www.bmk.gv.at/themen/klima_umwelt/klimaschutz/ufi/publikationen/evaluierung-sauber-heizen.html
- Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation, and Technology (BMK) (2022): Ministerial Draft - Renewable Heat Act – EWG. Available online at https://www.parlament.gv.at/dokument/XXVII/ME/212/fname_1451879.pdf
- Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation, and Technology (BMK) (2021a): District Heating. Available online at <https://www.bmk.gv.at/themen/energie/energieversorgung/fernwaerme.html>
- Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation, and Technology (BMK) (2021b): Renewable gas in Austria 2040 - Quantitative estimation of demand and supply. Available online at <https://www.bmk.gv.at/dam/jcr:2486be49-85cd-41d6-b2af-a6538757e5cd/Erneuerbares-Gas-2040.pdf>
- Gas Connect Austria GmbH (2024): Wartungsarbeiten. Gas Connect Austria GmbH (ed.). Online available at <https://www.gasconnect.at/netzinformationen/netzentwicklung/wartungsarbeiten>
- Gas Industry Act (GWG) (2011; Version dated September 7, 2023). Available online at <https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20007523>
- Gas System Charges Ordinance (2013; Version dated January 1, 2022). Available online at <https://www.ris.bka.gv.at/GeltendeFassung/Bundesnormen/20007992/GSNE-VO%202013%2c%20Fassung%20vom%2001.01.2022.pdf?FassungVom=2022-01-01>
- GLOBAL 2000 (2023): Transformation der Gasinfrastruktur im Zeichen der Energiewende. Available online at https://www.global2000.at/sites/global/files/g2_report_gasinfrastruktur_223-rz-web.pdf
- Krutzler, T.; Wasserbauer, R.; Schindler, I. (2023): Energie- und Treibhausgas-Szenarien 2023. Umweltbundesamt Österreich (ed.). Wien. Online available at <https://www.umweltbundesamt.at/fileadmin/site/publikationen/rep0882.pdf>
- Lechinger, Vanessa (Vienna University of Economics and Business); Matzinger, Sandra (Department of Economic Policy, Vienna Chamber of Labor) (2020): Heating in Austria, Types of Heating and Energy Sources in Austrian Households in a Social Context. Economic Policy Standpoints No. 36 (2020), Chamber of Labor for Vienna. Available online at https://wien.arbeiterkammer.at/service/newsletter/wirtschaftspolitik/WP-Standpunkte_2020_01.pdf
- Parlament Österreich (15 Dec 2023): Press release: Nationalrat besiegelt Ende von Gasheizungen in Neubauten, EU-Emissionshandelsrichtlinie und EU-CO2-Grenzausgleich wird national umgesetzt. Wien. Online available at https://www.parlament.gv.at/aktuelles/pk/jahr_2023/pk1416#XXVII_I_02268
- Rehbogen, A. and Strasser, H. (2021): Energie und Klimaschutz in hoheitlichen Planungsprozessen berücksichtigen, Bedarf, Anwendungsfälle und Lösungsansätze aus der Praxis. SIR – Salzburger Institut für Raumordnung und Wohnen, Fachbereich Energie (ed.). Online available at <https://waermeplanung.at/wp-content/uploads/2021/08/Energie-in-hoheitlichen-Planungsprozessen-ber%C3%BCcksichtige.pdf>
- Renewable Expansion Act (EAG) (2021; Version dated September 7, 2023). Available online at <https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20011619>

List of sources

- Rodgarkia-Dara, A.; Gatzen, C.; Sonnen, L.; Lane, A.; Zwickl-Bernhard, S.; Auer, H. (2023): Rolle der Gasinfrastruktur in einem klimaneutralen Österreich. TU Wien (ed.). Online available at <https://www.bmk.gv.at/dam/jcr:97af7b7e-0b5e-4d98-bdd2-e82d559955a4/Rpt-Frontier-TU-Wien-AIT-Gasinfrastruktur-in-klimaneutralen-Oesterreich-Bericht-final-10072023-bf-v3-stc.pdf>
- Wiener Netze GmbH (2024): Aktuelle Baustellen der Wiener Netze. Wiener Netze GmbH (ed.). Online available at <https://www.wienernetze.at/baustellenauskunft>

Contacts

Sibylle Braungardt, Marc Stobbe

Öko-Institut e.V. – Institute for Applied Ecology
Postfach 17 71
D-79017 Freiburg
Germany

Mails:

s.braungardt@oeko.de
m.stobbe@oeko.de

Jan Rosenow

Regulatory Assistance Project (RAP)
Anna-Louisa-Karsch-Straße 2
D – 10178 Berlin
Germany

Mail:

jrosenow@raponline.org