Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

The Gas Grid Hurdle in the race to System Efficiency

Marc Stobbe, Veit Bürger, Sibylle Braungardt, Tilman Hesse, Malte Bei der Wieden, Carmen Loschke (Öko-Institut), Megan Anderson (Regulatory Assistance Project)



Marc Stobbe
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Agenda

1 Background

2 Gas grid development

3 Regulatory framework

4 Analysis

5 Recommendations for policy and regulation

Background

- Fossil gas accounted for 23.7% of the EU-27's primary energy consumption (2021)
- Utilisation of efficient heating solutions will have an impact on gas distribution networks
- EU directives
  - Efficiency First Principle
  - Energy Efficiency Directive (EED) > Regional/municipal heating plans (Article 25) and efforts to reduce stranded assets
- Gas package
  - Hydrogen network distribution plans (Article 52)
  - Network decommissioning plans (Article 52b)
- "gas decarbonisation" via alternative gases rather than "system decarbonisation" > impeding the impact of EU legislation

Background

- Contents
  - Analysis of the gas grid infrastructure development and its alignment with energy transition targets
  - Analysed countries: Austria, Germany, the Netherlands, and the UK.
  - “How has the gas grid infrastructure developed in these countries, and to what extent does it align with sustainable heat supply goals?”

- Methods
  - Review of historical data
  - Analysis of policy documents
  - Interviews with key stakeholders

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Gas grid development

- Share of fossil gas from total final energy demand:
  - Germany: 26.4 %
  - Austria: 22.7 %
  - Netherlands: 41.5 %
  - UK: 42.8 %
- Total length of distribution network:
  - Germany: 550,000 km
  - Austria: 54,000 km
  - The Netherlands: 125,000 km
  - UK: 284,000 km

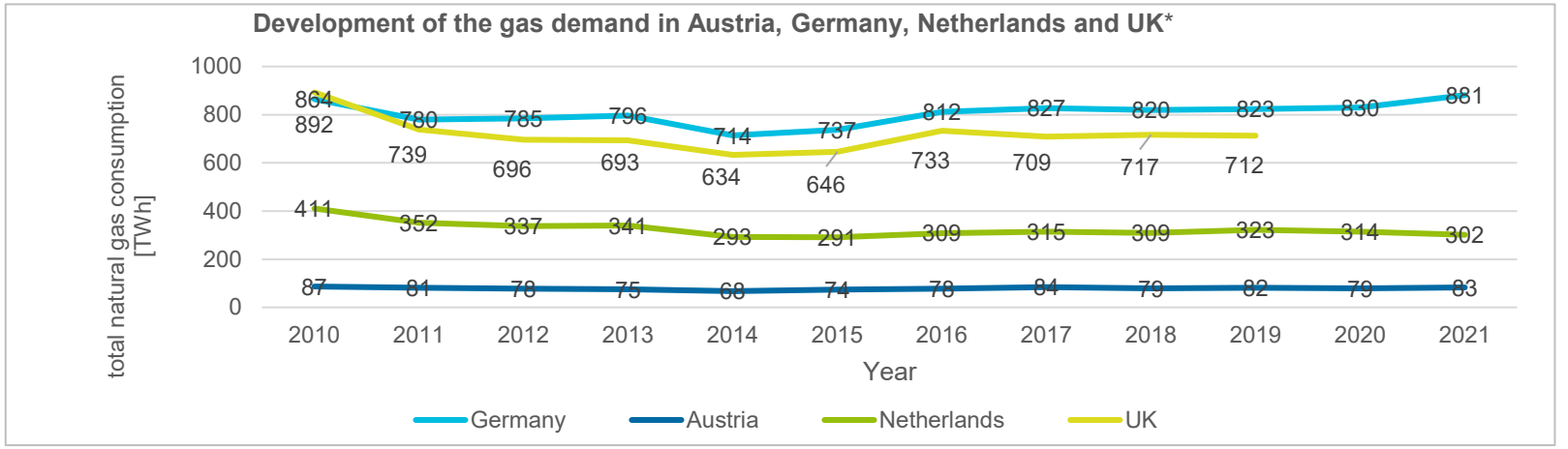


*Figure 1: Consumption of fossil gas per year.*Due to Brexit, there is no data available after 2019 for the United Kingdom*

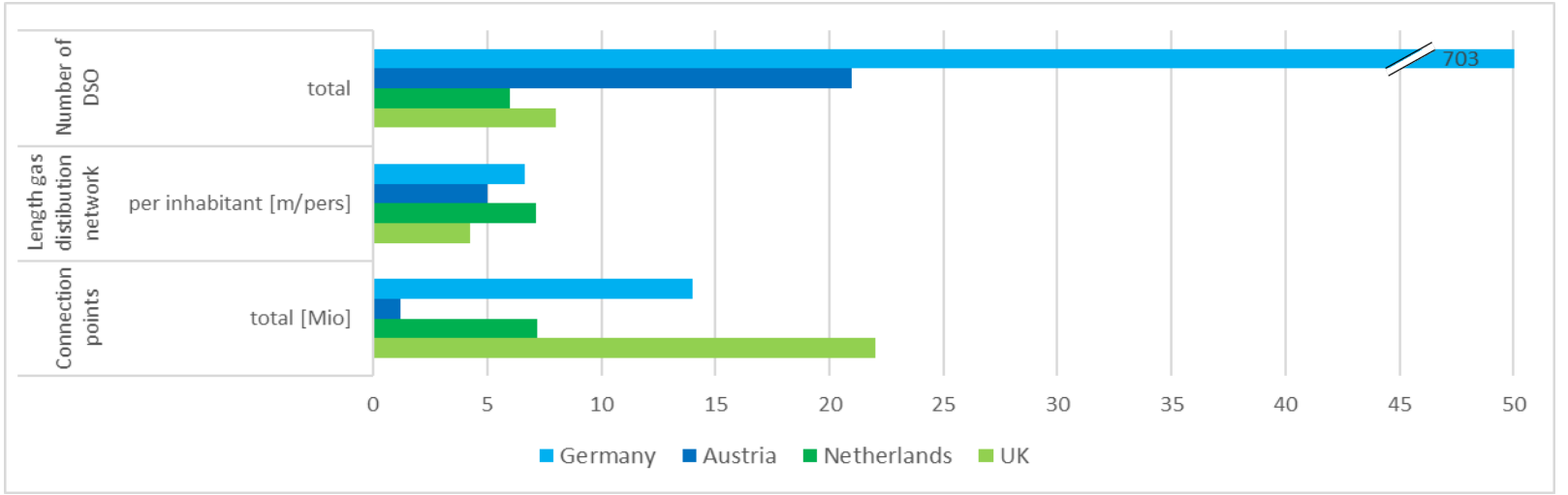


Figure 2: Comparison of characteristics of national gas distribution grids

Gas grid development

- Grid in Austria and Germany expanded over the last decade
- Gas boilers have traditionally held a dominant position in the heating markets of the four countries
- All countries plan to establish a hydrogen network
- Austria and the Netherlands are significantly increasing biomethane production (plans)

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Regulatory framework

- New European regulation
  - Article 25 of the EED
  - Gas Package: Articles 52 and 52b
- Grid development planning
  - Gas transmission network planning is demand-oriented
  - Plans are based on future gas demand forecasts, including fossil gas, hydrogen, and biomethane
- Connection requirements
  - Austria, Germany, and UK: DSOs must connect customers to the gas network on request
  - The Netherlands: DSOs must connect customers except in designated district heating areas

Regulatory framework

- Grid charges/depreciation periods
  - Grid charges: Cost-plus approach
  - Germany: Depreciation until 2045 possible
  - Netherlands: Degressive depreciation
  - Austria: Depreciation over 30-40 years
  - UK: 45-year depreciation
- Heat planning
  - Germany: Local heat planning
  - Netherlands: Local decarbonisation plans (gas-free areas possible)
  - Austria: Handles heat planning regionally
- Gas boiler regulations
  - Germany: New heating systems > minimum of 65% renewable heat
  - Austria: Ban on new gas boilers in new buildings
  - Netherlands: New buildings prohibited to connect to the gas grid since July 2018
  - UK: Aims to phase out new fossil gas boilers by 2035

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Analysis

Insufficient alignment with climate scenarios

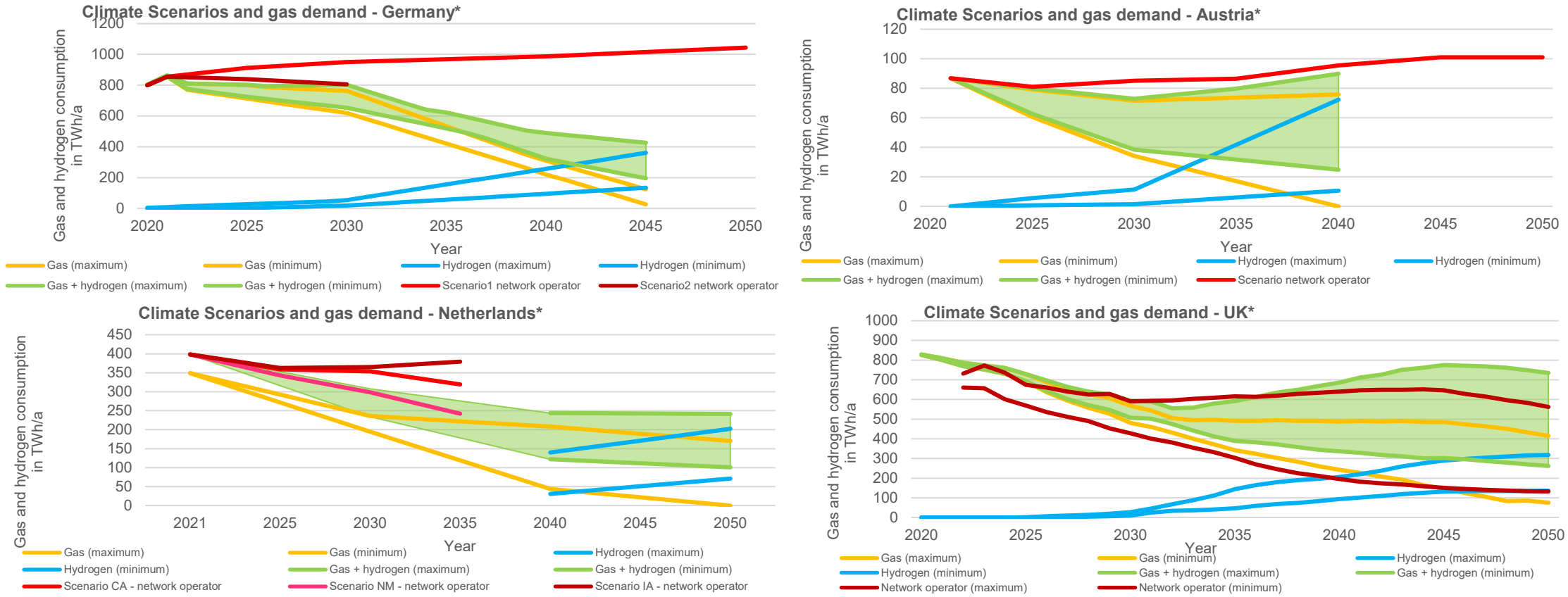


*Figure 3:Future gas and hydrogen demand in Germany, Austria, the Netherlands and the UK based on different scenarios that aim to achieve the climate targets of the respective countries and projected developments of the gas network operators (The values in the green corridor do not correspond solely 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: Germany: Agora, dena, BDI, Ariadne Remind, Ariadne REMod, BMWK T45-Strom, BMWK T45-H2, BMWK T45-PtG/PtL; Austria: AGGM, TUW – Electrification, TUW - Green Gases, TUW - Green methane, TUW - Decentralised green gases, ÖNIP and UBA-Transition and of the network operators (AGGM 2022); Netherlands: Decentralised Initiative, National Leadership, European Integration, International Trade, Adapt and Transform; UK: Tailwinds, Headwinds, Widespread Engagement, Widespread Innovation, Balanced Net Zero Pathway, Tailwinds.*All values refer to the net calorific value.)*

Analysis

- Lack of consideration of system efficiency in infrastructure planning
- Regulatory framework not reflecting decommissioning needs
- Insufficient consideration of vulnerable customers
- Insufficient coordination between gas grid and heat planning

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Recommendations for policy and regulation

- Integrated heat and grid planning
  - Heat planning should aim for efficient, effective, and equitable supply and coordinate with infrastructure planning, consider long-term gas network impacts, and avoid hybrid heat pumps to ensure system efficiency
- Infrastructure planning in uncertain times
  - New heating systems must align with long-term climate targets due to long investment cycles
  - Infrastructure planning should prioritise electrification and district heating (efficiency)
- Making the regulatory framework fit for the gas phase-out
  - Regulatory framework must allow for complete withdrawal from gas supply
  - Necessary changes: incentivizing system efficiency, permitting disconnection, stopping incentives for new connections, setting aside funds for decommissioning costs, and shortening depreciation periods

Contact

Marc Stobbe
Researcher

Oeko-Institut e.V.
Office Freiburg
PO Box 17 71
79017 Freiburg

Phone: +49761 45295-284
mail: m.stobbe@oeko.de

Thank you for your attention!

Do you have any questions?

