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A simple line-art icon of a bar chart with three bars of increasing height, positioned to the right of the text.

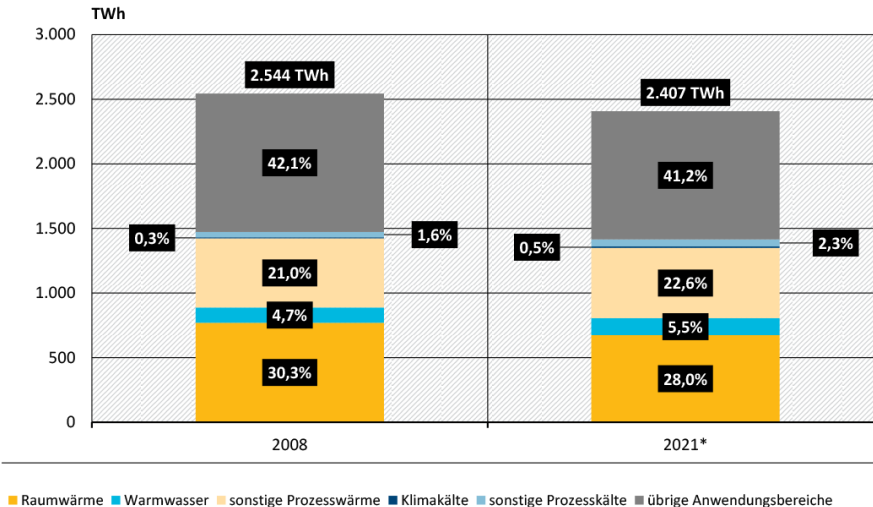
REPUBLIC OF SLOVENIA
MINISTRY OF THE ENVIRONMENT,
CLIMATE AND ENERGY

Strategies & Policies on Geothermal Energy in Germany

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Heating & Cooling in Germany

Anteil des Wärmeverbrauchs¹ am Endenergieverbrauch 2008 und 2021



2021: 58,8 % of total energy consumption for H&C

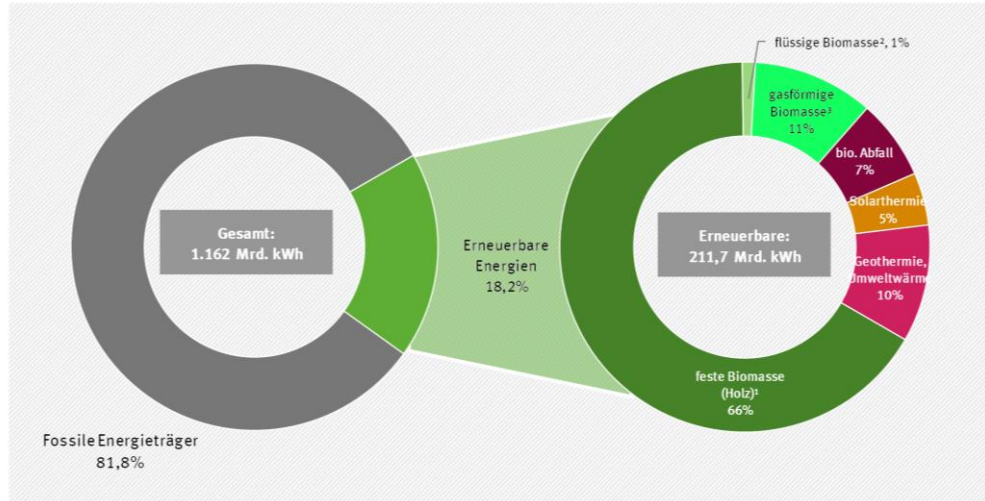
¹ inkl. Kälteanwendungen
* vorläufige Angaben

Quelle: Eigene Darstellung UBA auf Basis AGEB,
Anwendungsbilanzen, Stand 02/2023

Heating & Cooling in Germany

Endenergieverbrauch erneuerbarer Energien für Wärme und Kälte im Jahr 2022

Anteile in Prozent [%]



2022: 18.2 % Renewables

→ 10% Geothermal & „other environmental heat sources“ (incl. ASHP)

¹ inkl. Klärschlamm und Holzkohle

² inklusive Biodiesel für Land- und Forstwirtschaft, Baugewerbe und Militär

³ Biogas, Biomethan, Klärgas, Deponiegas

Quelle: Umweltbundesamt (UBA) auf Basis AGEE-Stat
Stand 09/2023

District Heating in Germany

- 9% of heat-demand covered by district heating (14% private hh)
 - 7% renewable
- 3800 networks, >20.000km



Netzlänge je Bundesland; Quelle: [84]

* Diese Daten liegen aus Geheimhaltungsgründen nicht aus der Statistik vor. Für Hamburg wurden ebenfalls die Werte aus der ADFW-Umfrage für das Jahr 2020 verwendet
** Diese Daten liegen aus Geheimhaltungsgründen nur für das Jahr 2018 vor.

Geothermal Energy in Germany

- 42 Installations >400m
 - 30 heat only
 - 2 power only
 - 10 CHP

- 417 MW heat, 46 MW power
- 470.000 GSHP (ca. 4.700 MW)



Policies for the heating Transition in Germany

- Heat strategy for cities (> 100.000 until 2026)
- Renewable Heating Networks Act (50% in 2023)
- GEG – Buildings Energy Act (specifications for insulation, renewable heating etc.)

- BEW - Investmentsupport for heating networks (construction & decarbonisation)
- BEG – Investmentsupport of building refurbishment & new buildings & transformation of heating systems



Geothermal Research in Germany

- 7./8. Energy Research Program of the Federal Government
 - Basic Research Calls by BMBF (Ministry for Education and Research)
 - Permanent Program for applied Research by BMWK (Ministry for Economic Affairs & Climate)
 - Exploration Campaign
 - CETP Calls

Geothermal Strategy in Germany

Strategy paper on 11.11.2022: „Geothermal for the heating transition“

1. Dialogue Process – Stakeholder Involvement - **STARTED**
2. Data Campaign – Connect data for all depth ranges on all levels (all state GS involved) – **STARTED**
3. Exploration Campaign – 100 sites until 2030 – **STARTED**
4. Accelerate permitting – **Discussions started**
5. Support programs – 7./8. ERP, BEW, Resource efficiency in industry – **STARTED**
6. Risk Mitigation – **Discussions started**
7. Fight skilled labour shortage & enhance exploration/drilling capacities – **partly STARTED**
8. Public acceptance measures – **Integrated in 2./3.**

Geothermal Research & Innovation priorities in Germany

**Main
Focus:
Broad
Rollout of
geothermal
heating**

● Research Focus:

- Demo- and pilotprojects of innovative technologies (high TRL).
- Improvement of thermal storage technologies
- Geological Data
- Safety aspects and risk reduction
- Mineral extraction from geothermal brines (co-generation to heat/power production)
- Technology development:
 - Drilling
 - Exploration
 - Operational Issues
 - Shallow depth soundings
 - Large scale heat pumps
 - Reservoir optimization & management

Geothermal Showcases in Germany

Cities:

- Munich (since 2008):
 - 6 Geothermal Heating Plants so far
 - 900 km Network
 - 2040 100% Renewable heat
- Schwerin (since 2015)
 - Doublet, extension planned
 - HP to reach DH-T°
- Hamburg (2025?)
 - Doublet
 - HP Cascade planned

Examples for new Research Projects 2023 (~29 M € Funding)

- DEEP MTD – Micro Turbine Drilling Demo (FhG-IEG, geoprime GmbH, Solexperts GmbH)
- RESTLESS – Induced Seismicity in relation to lithology, structural setting & stressfield
- DECARBSN – Accompanying research/3D seismics for the further development of geothermal energy in Schwerin
- UVT: Urban Vibroseis Truck – Seismic Vibration-Source with approval for road service
- ROCKET - Rapid Wireline / Coil based radial jet drilling



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Thank you !

Questions?