

Market survey - Germany



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North German Basin

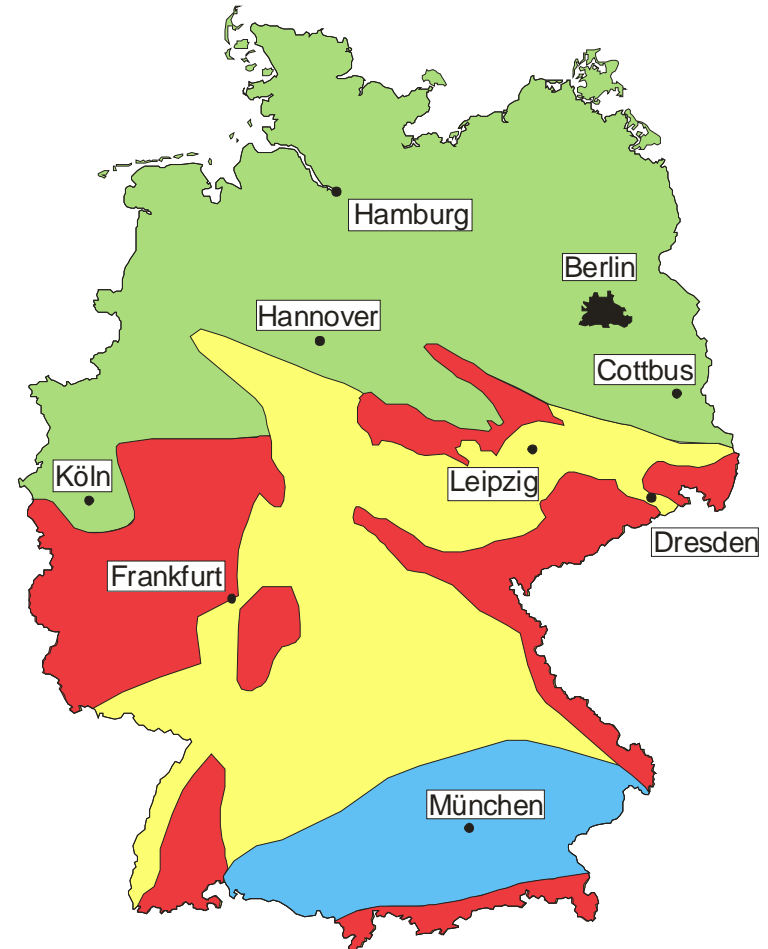
- Temperature 130-160°C
- Depth: 4000 – 5000 m
- Flow rate: max 100m³/h
- High salinity (up to 250g/l)

Molasse Basin

- Temperature 100-140 °C
- Depth: 2500 - 4000m
- Flow rate: >200 m³/h
- Nearly fresh water

Upper Rhine Graben

- Temperature 130 – 160°C (180°C)
- Depth: 2500 - 4000 m
- Flow rate: up to 200 m³/h
- Salinity (100 – 200 g/l)



Annual technical potential for geothermal electricity generation:
300 TWh/a (Report Nr 84, Office of Technologie Assessment at the German Parliament)

Installed plants for direct use of heat (without heat pumps)*

- Total capacity 105 MW_{th} (~ 30 plants with installed power > 100kW_{th})
- Thereof approx. 31 MW_{th} in plants > 4 MW_{th}
- Thereof approx. 21.5 MW_{th} with > 65°C (total three locations)

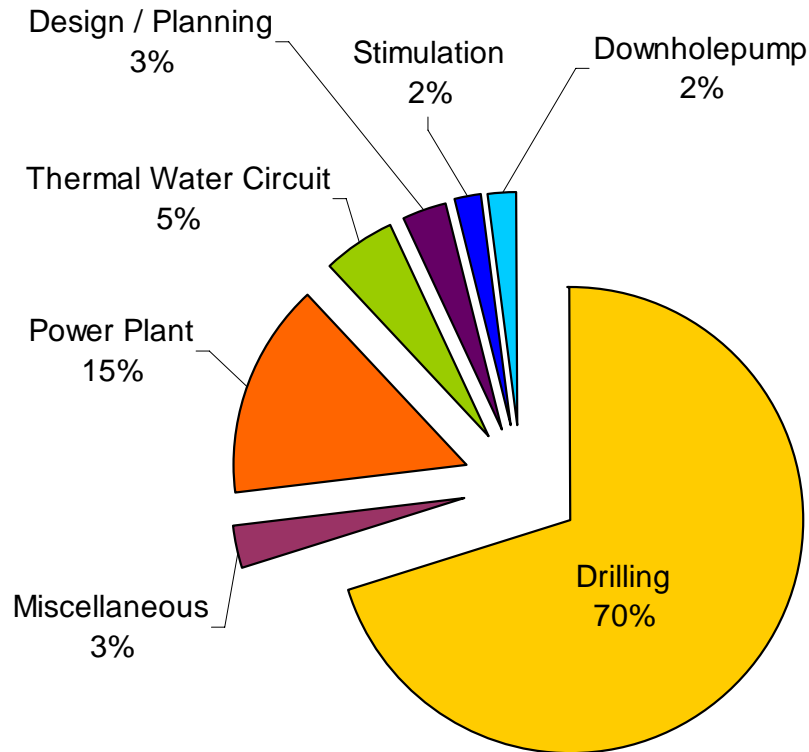
Installed plants with electricity generation

- Total capacity 200 kW_{el}
- Located in Neustadt-Glewe (North German Basin)
- In operation since 2003
- Flow rate about 100 m³/h, temperature 97°C
- Coupled with heating station

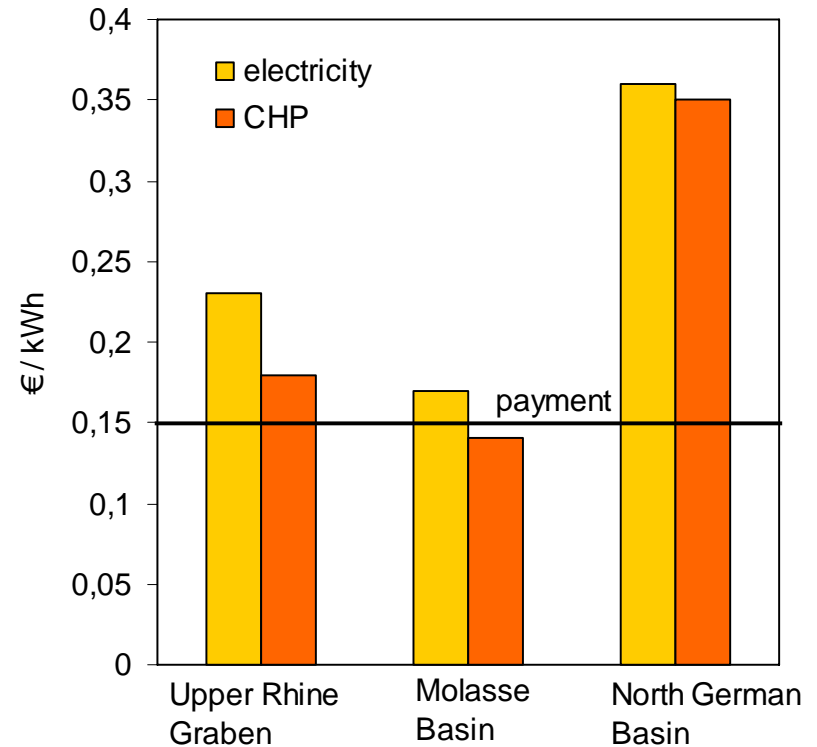
*R. Schellschmidt, B. Sanner, R. Jung, R. Schulze 2005

Location	Planned Use	T (°C)	flow rate m ³ /h	Power generation/ Direct use of geothermal energy	Planned Initial operation
Groß Schönebeck (NGB)	Power	150	75	1 MWel	2008
Bad Urach (URG)	Power	170	48	1 MWel	stopped
Offenbach, Bellheim (URG)	Power	150	360	3.5 MWel (Kalina)	stopped
Bruchsal (URG)	Power	120	86	0.4-0.5 MWel	2007
Speyer (URG)	Power, district heating	150	450	5.4 MWel, 24 MWth	Oil was found
Landau in der Pfalz (URG)	Power, district heating	150	180 – 250	2.5 MWel / 7 MWth	2007
Unterhaching (MB)	Power, district heating	122	540	3.7MWel / 16 MWth (Kalina)	2007
Isar-Süd (München, MB)	Power, district heating			2 MWel / 30MWth	
Bochum (Prometheus)	Space heating	115		10 MWth	
Hannover (GeneSys)	Space heating	135	50	4 MWth	
Aachen (SuperC)	Space heating	85		0.48MWth	
Weinheim (Miramar) (MB)	District heating, thermal spa	65		2.3 MWth	
Unterschleißheim (MB)	District heating	79	320	20.6 MWth	
München-Riem (MB)	District heating	90	180	12 MWth	

Average allocation of investment costs



Geothermal electricity generation costs



Current situation

- Electricity generation costs range from 14 ct/kWh to 35 ct/kWh
- low temperature: planned capacity 35 MW_{th} (only heat provision)
- CHP-plants: planned capacity approx. 8 Mw_{el} / 50 MW_{th}
- Electricity generation: planned capacity approx. 5 MW_{el} (1.5 MW_{el})

Future market situation will be determined

- Development of drilling technology (cost reduction)
- Development of specific regional exploration strategies
- Development of stimulation technologies – enhanced productivity
- Development of power plant technology (cost reduction, efficiency improvement)
- **Success of current projects**