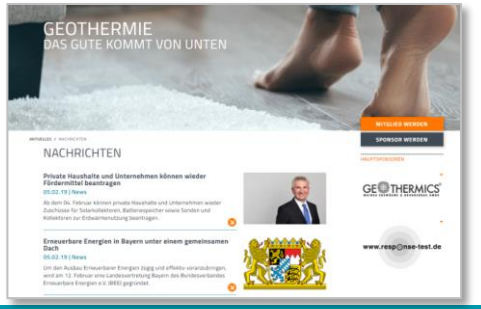
Bundesverband Geothermie



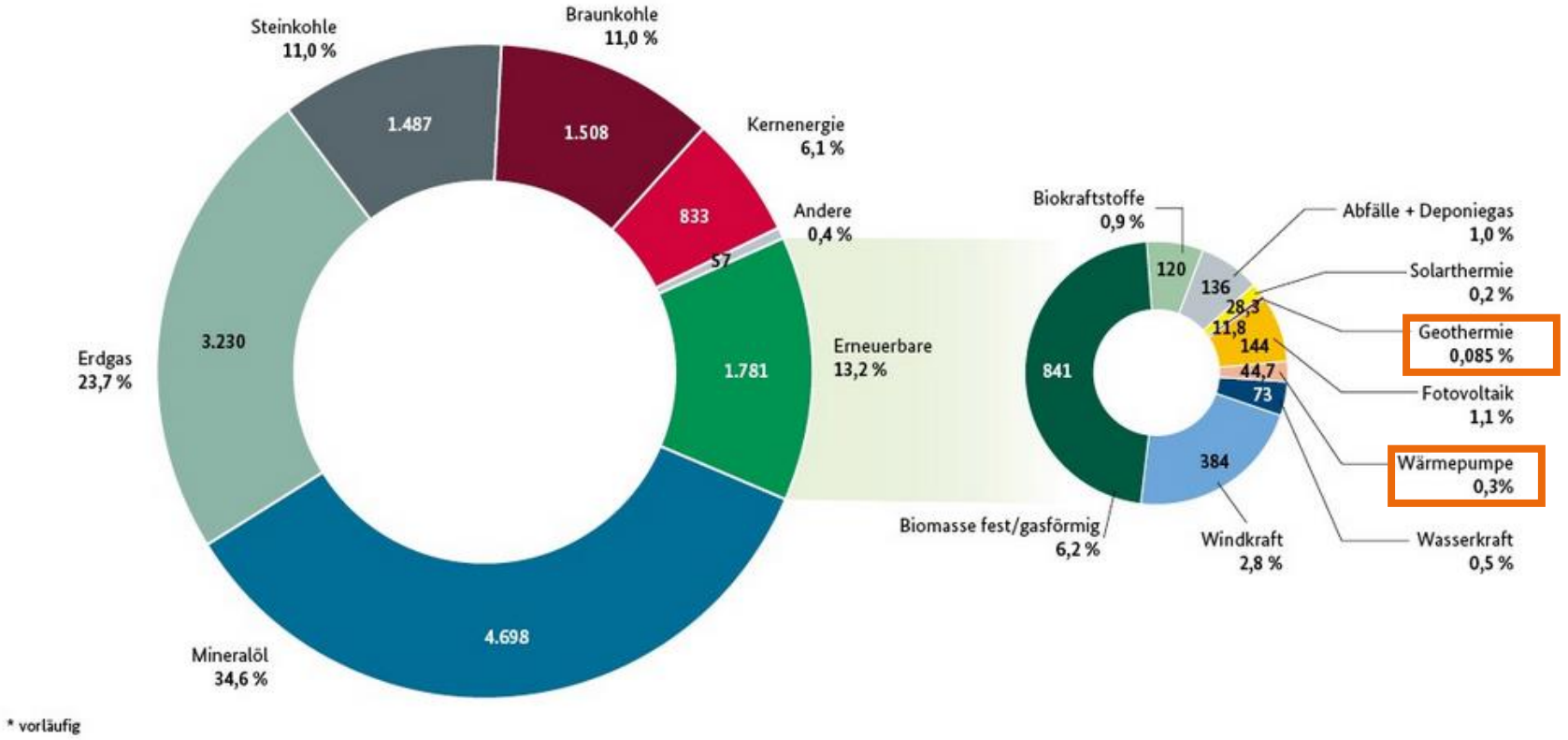
Country Report Germany

Final Conference GeoPLASMA-CE

Freiberg, 22. Mai 2019

Bundesverband Geothermie

Geothermal energy in the overall market



Source: Arbeitsgemeinschaft Energiebilanzen (AGEB), Arbeitsgruppe Erneuerbare Energien-Statistik (AGEE-Stat) 2019 (Daten 2017)

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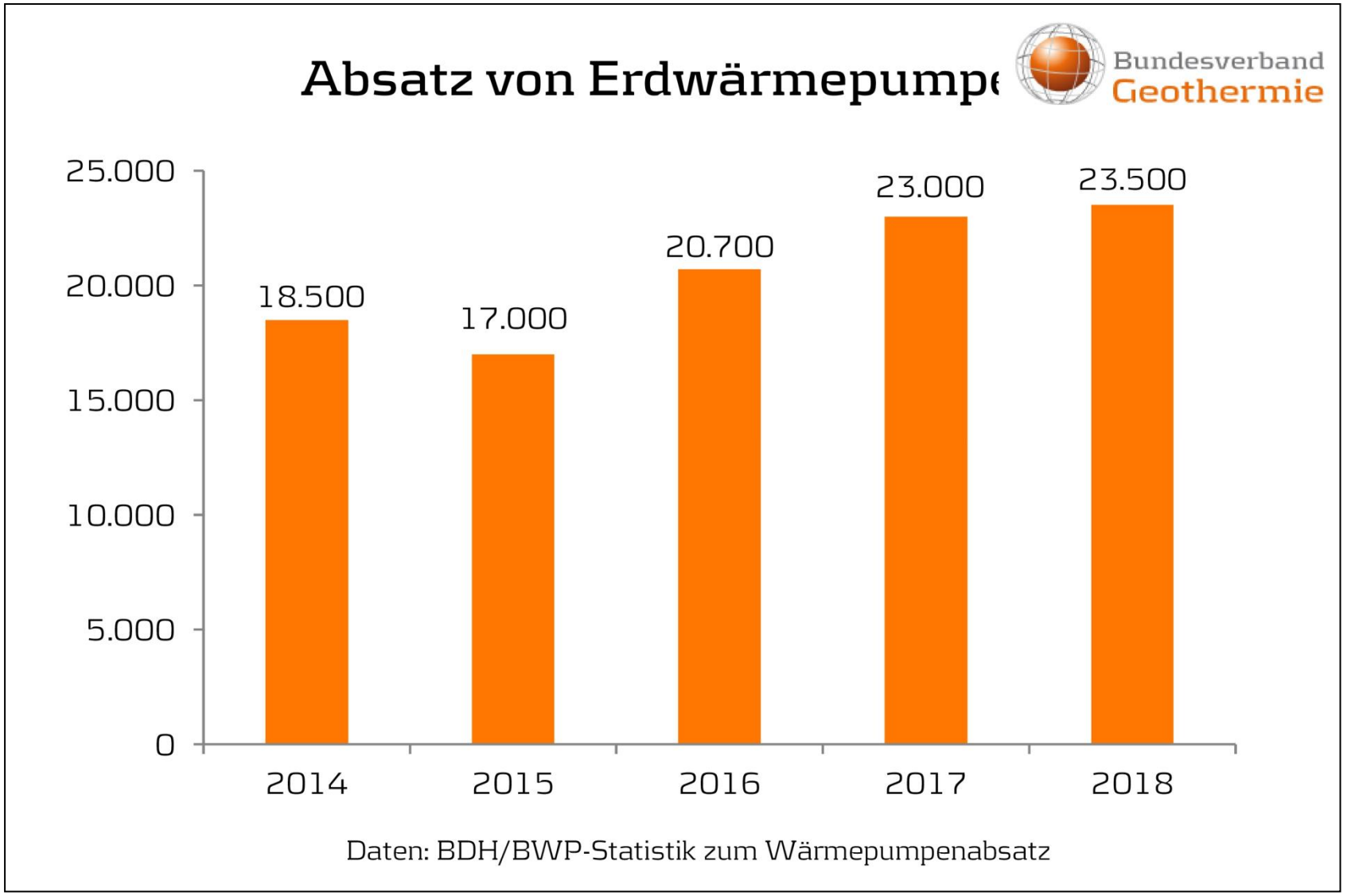
Shallow Geothermal Energy

Bundesverband Geothermie

sales of ground source heat pumps



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funded installations per federal state

	Total heat pump systems				Total share of GSHP			
	number	funding	investment	capacity	number	funding	investment	capacity
Berlin	154	644.428	2.449.002	1.254	109	542.991	1.848.044	878
Brandenburg	1.066	5.122.615	16.828.350	9.629	936	4.740.524	14.831.349	8.562
Baden-Württemberg	2.105	7.731.590	39.217.047	21.151	1.132	5.790.026	22.393.782	12.231
Bayern	3.154	13.153.082	57.486.941	34.368	2.314	11.301.245	43.631.562	27.014
Bremen	33	143.376	649.157	298	26	129.576	565.895	245
Hessen	695	2.512.350	12.385.410	6.478	369	1.860.071	7.104.969	3.643
Hamburg	59	257.175	1.399.069	508	51	243.875	1.289.309	454
Mecklenburg-Vorpommern	391	1.719.223	6.107.014	3.095	315	1.537.925	5.053.605	2.559
Niedersachsen	1.586	7.021.997	27.182.077	12.668	1.350	6.522.484	23.743.082	10.893
Nordrhein-Westfalen	4.564	20.665.158	82.730.331	41.689	3.917	19.424.689	73.191.680	36.680
Rheinland-Pfalz	1.311	5.715.066	22.413.678	11.911	993	5.037.963	17.484.730	8.920
Sachsen-Anhalt	455	2.047.493	7.306.307	4.092	370	1.845.004	6.198.482	3.330
Saarland	130	461.990	2.133.832	1.122	70	353.467	1.206.946	680
Schleswig-Holstein	933	4.220.088	16.038.227	5.759	865	4.078.680	15.025.093	5.290
Sachsen	1.440	6.962.216	23.131.622	13.442	1.266	6.559.245	20.953.151	11.895
Thüringen	344	1.508.603	5.067.045	3.380	259	1.339.926	3.988.411	2.678
G e s a m t	**18.420**	**79.886.451**	**322.525.110**	**170.844**	**14.342**	**71.307.690**	**258.510.090**	**135.951**

Data: BAFA 2018

Subsidised installations per federal state + inhabitants

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erdwärmeLIGA deutschland

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Offizielle Daten 2018

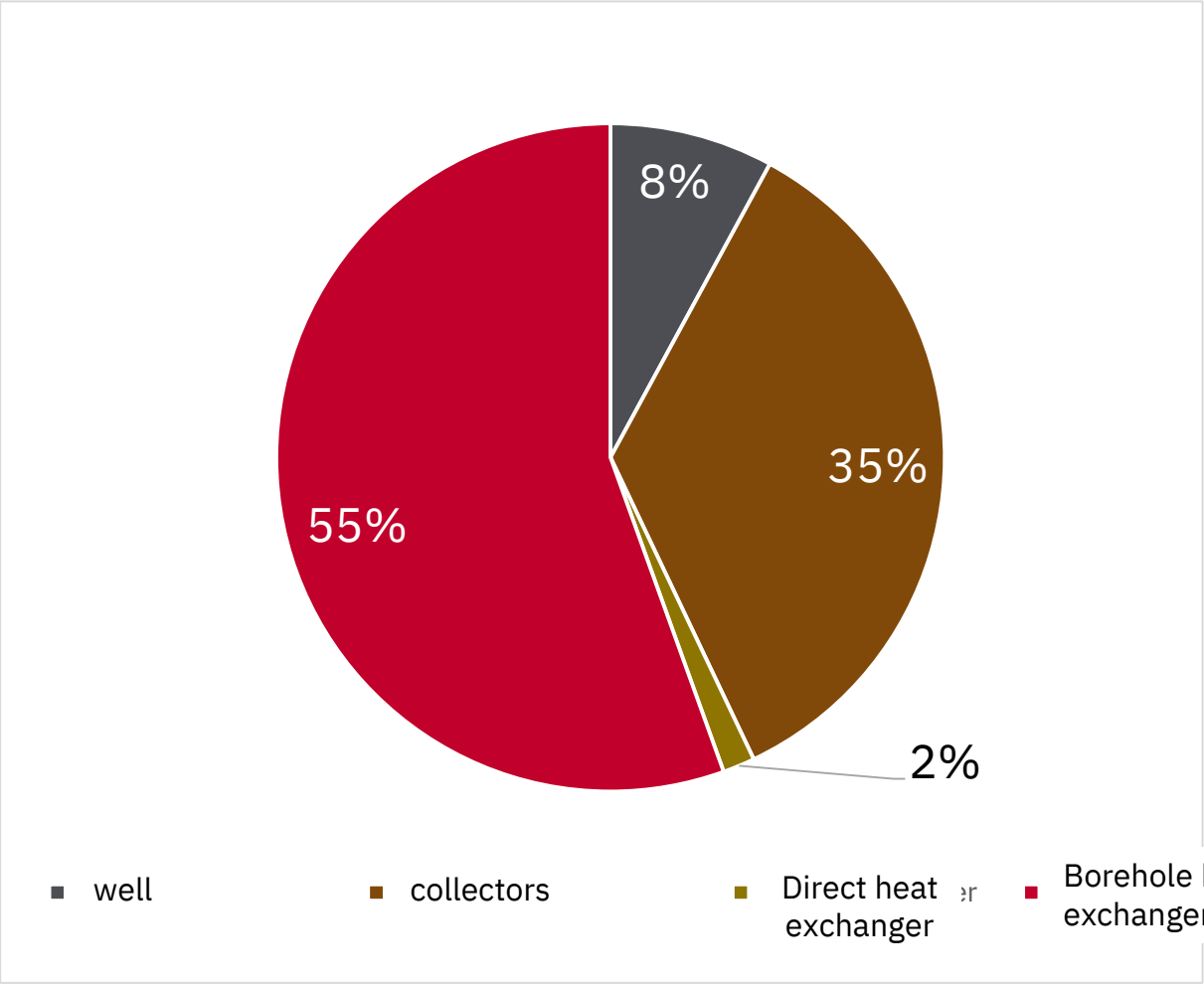
Bundesland	Einwohner	Sole-Wasser-Wärmepumpen			Wasser-Wasser-Wärmepumpen			Gesamtleistung	Punkte[1]
		Anz	Leistung	Leistung / Anlage	Anz	Leistung	Leistung / Anlage		
1. Brandenburg	2.494.648	575	5.286 kW	9,19 kW	3	43 kW	14,33 kW	5.329 kW	214
2. Sachsen	4.081.783	835	7.651 kW	9,16 kW	10	154 kW	15,40 kW	7.805 kW	191
3. Rheinland-Pfalz	4.066.053	641	5.594 kW	8,73 kW	7	115 kW	16,43 kW	5.709 kW	140
4. Nordrhein-Westfalen	17.890.100	2.360	20.814 kW	8,82 kW	73	1.209 kW	16,56 kW	22.023 kW	123
5. Bayern	12.930.751	949	9.087 kW	9,58 kW	471	6.747 kW	14,32 kW	15.834 kW	122
6. Schleswig-Holstein	2.881.926	534	3.232 kW	6,05 kW	—	—	—	3.232 kW	112
7. Mecklenburg-Vorpommern	1.610.674	193	1.576 kW	8,17 kW	2	48 kW	24,00 kW	1.624 kW	101
8. Sachsen-Anhalt	2.236.252	229	1.994 kW	8,71 kW	1	8 kW	8,00 kW	2.002 kW	90
9. Thüringen	2.158.128	168	1.699 kW	10,11 kW	11	209 kW	19,00 kW	1.908 kW	88
10. Niedersachsen	7.945.685	812	6.174 kW	7,60 kW	12	179 kW	14,92 kW	6.353 kW	80
11. Baden-Württemberg	10.951.893	637	6.535 kW	10,26 kW	51	909 kW	17,82 kW	7.444 kW	68
12. Saarland	996.651	50	469 kW	9,38 kW	1	12 kW	12,00 kW	481 kW	48
13. Hessen	6.213.088	218	2.170 kW	9,95 kW	7	103 kW	14,71 kW	2.273 kW	37
14. Bremen	678.753	18	144 kW	8,00 kW	1	17 kW	17,00 kW	161 kW	24
15. Berlin	3.574.830	84	610 kW	7,26 kW	—	—	—	610 kW	17
16. Hamburg	1.810.438	23	223 kW	9,70 kW	—	—	—	223 kW	12

[1] Die Punktzahl berechnet sich als die im Zeitraum installierte Leistung in kW pro 100.000 Einwohner.

Die ermittelten Zahlen beruhen auf den im Rahmen des Marktanreizprogramms vom Bundesamt für Wirtschaft und Ausfuhrkontrolle (BAFA) geförderten erdgekoppelten Wärmepumpen.

Data: BAFA 2018

funded installations per installation type



Data: BAFA

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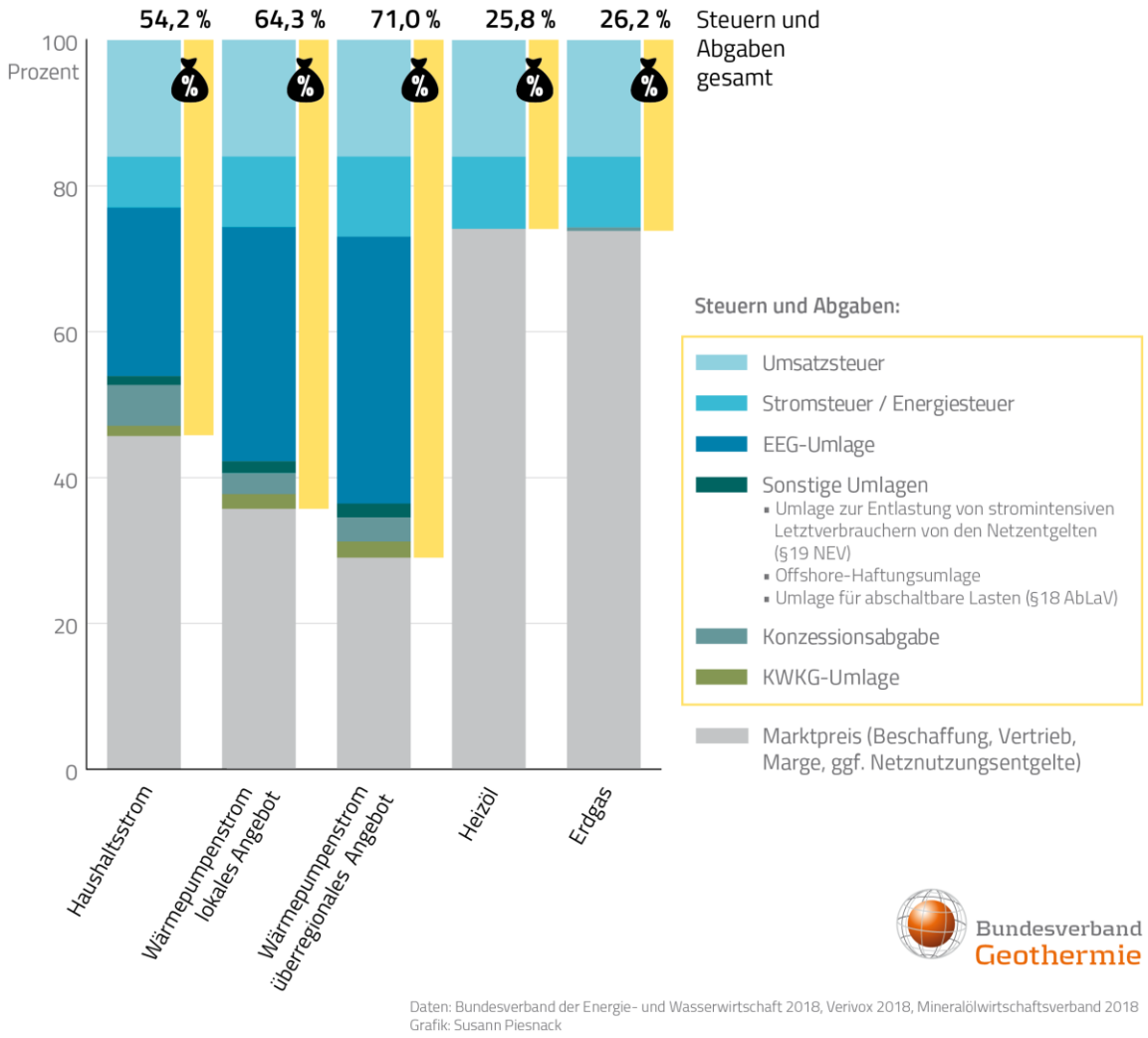
Average values for funded projects

	2014	2015	2016	2017	2018
capacity	14,3	11,2	9,9	9,4	9,0
SPF	4,4	4,8	4,9	4,9	4,9
funding	4.097 €	4.727 €	4.944 €	4.998 €	5.104 €
investment	17.443 €	18.032 €	18.389 €	17.609 €	17.046 €

Data: BAFA

Discrimination in the energy market

Taxes and levies on energy sources

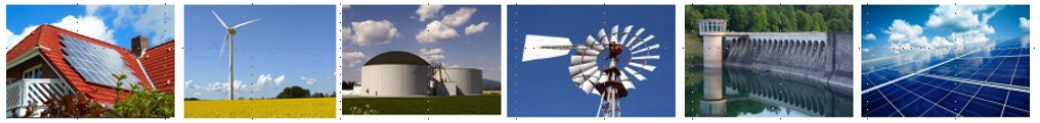


Daten: Bundesverband der Energie- und Wasserwirtschaft 2018, Verivox 2018, Mineralölwirtschaftsverband 2018
Grafik: Susann Piesnack

Geothermal energy is currently being systematically disadvantaged by the above-average burden of taxes and levies on the pump flow in competition with the energy sources heating oil and natural gas.

At present, subsidies under the EEG or the market incentive programme do not compensate for this competitive disadvantage.

Geothermal potential study NRW



Geothermal potential study NRW

Goal: renewable	Determination of regional potentials for energies in NRW (order of the MKULNV)
Forms of energy: water	wind, solar, biomass, geothermal energy,
Components:	1. Representation of the stock 2. Determination of regional potentials

Provision of results and basic data in the Energy Atlas NRW (www.energieatasnrw.de)

Introduction

- Consideration of shallow geothermal energy and use of geothermal probe technology (probe depth 100 m)
- Representation of potentials at municipal, district, administrative district and state level
- Use of geothermal energy on own property → Potentials depending on heat demand
- Involvement of a working group
  - Geologischer Dienst NRW, Energieagentur NRW, Bezirksregierung Arnsberg, Bundesverband Geothermie, FB 52 LANUV (Grundwasser) Untere Behörde

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Online geothermal energy portal NRW

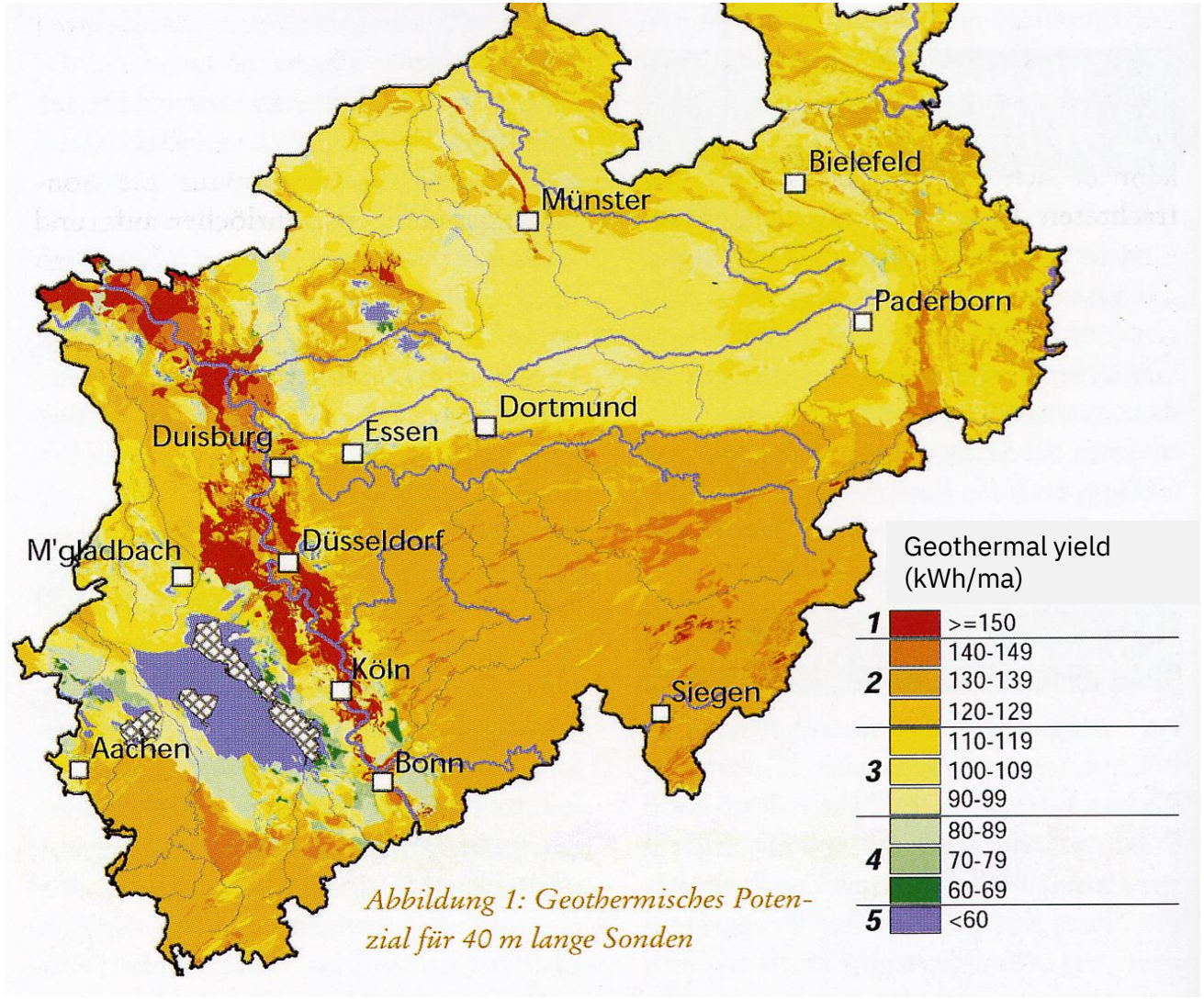
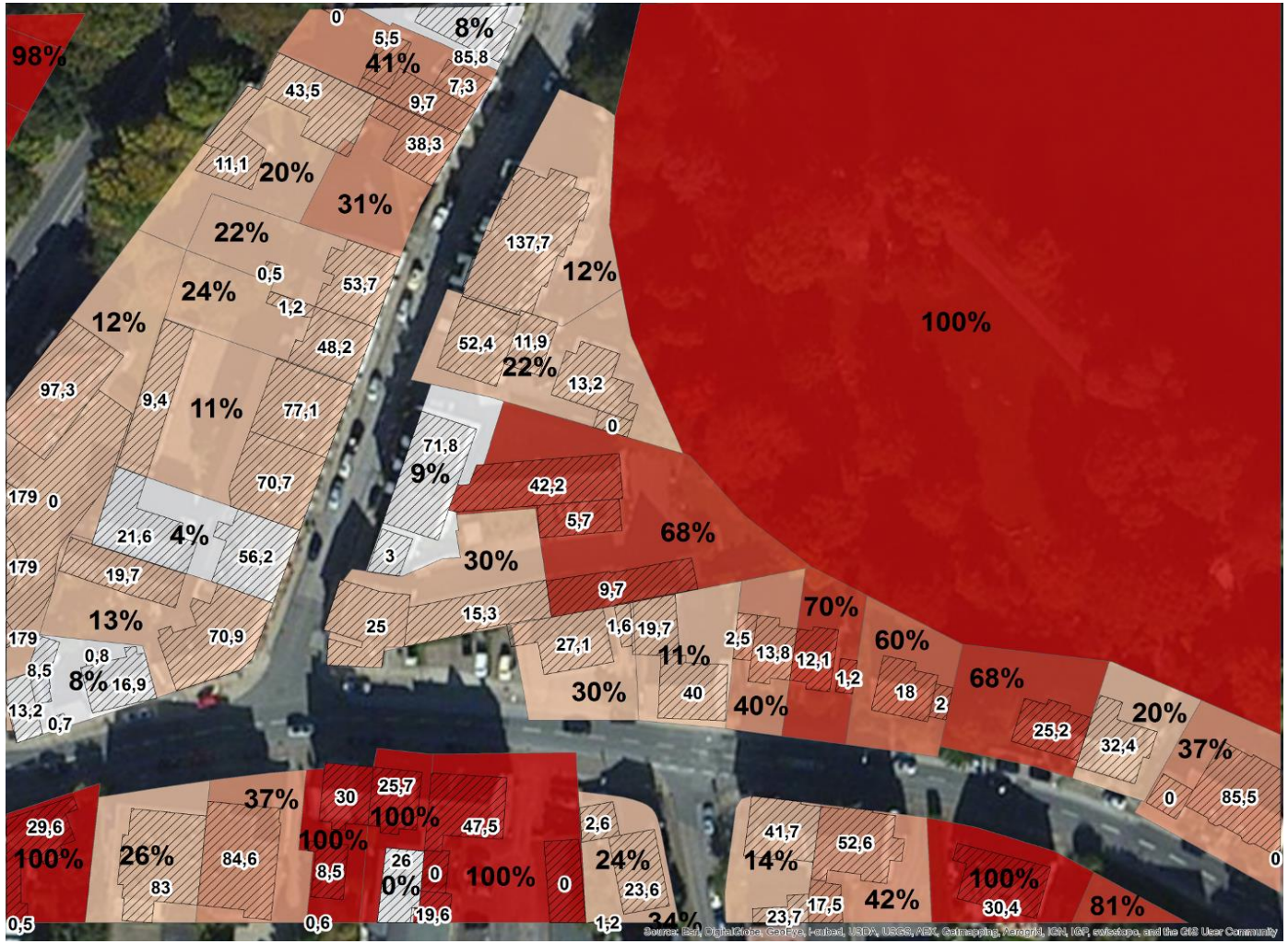


Abbildung 1: Geothermisches Potenzial für 40 m lange Sonden

Heat demand, occupancy units and percentage coverage by geothermal energy



Aerial photograph: ESRI

Geothermal potential study NRW

Total result

- Heat demand → 271,1 TWh/a
- Geothermal potential
  - Scenario A → 153,7 TWh/a
  - Scenario B → 141,3 TWh/a
- Cover ratio
  - Scenario A → 56,7 %
  - Scenario B → 52,1 %
- New Building
  - Per year → 0,43 TWh/a
  - Until 2025 → 6,0 TWh/a

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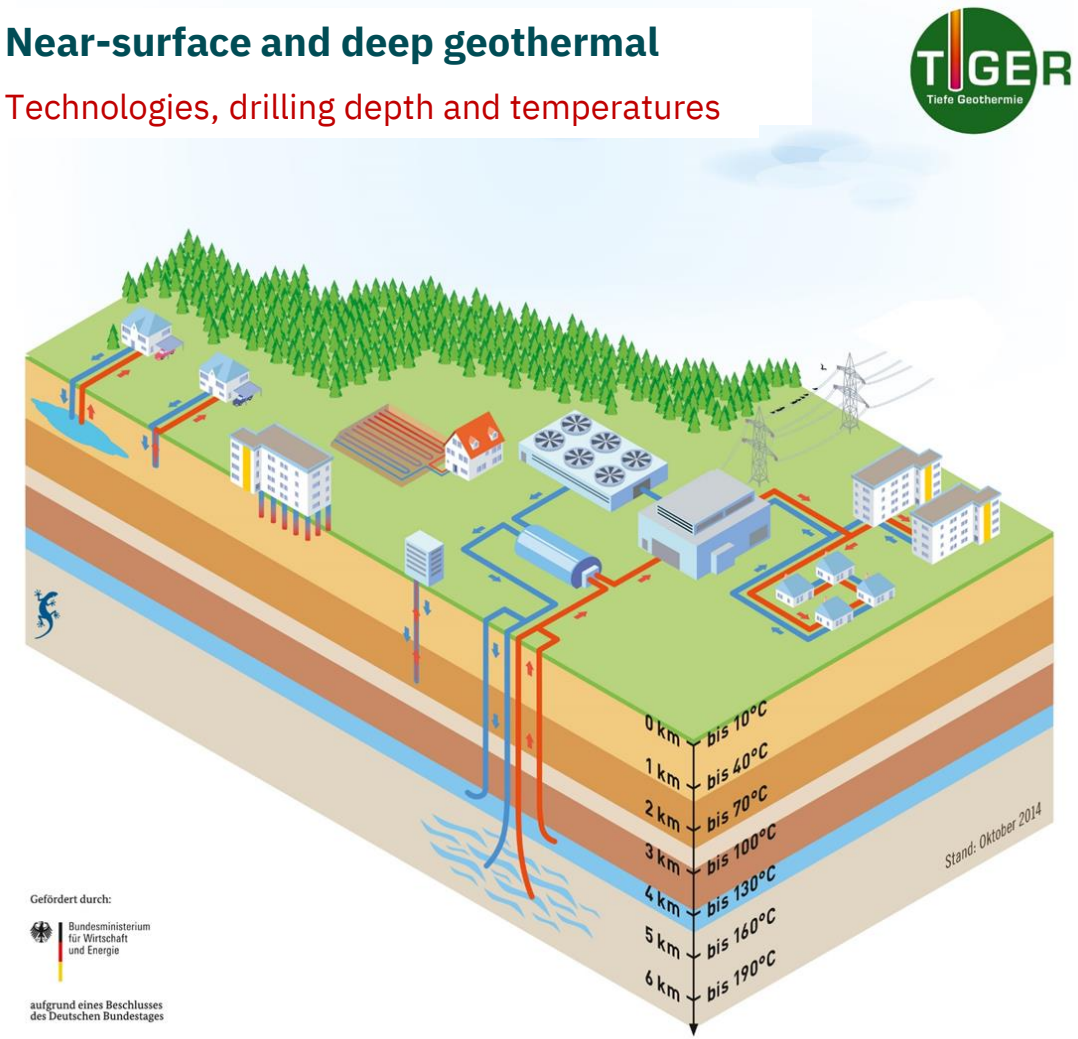
Deep Geothermal Energy

Status Quo in Germany

Near-surface and deep geothermal

Technologies, drilling depth and temperatures



- 36 Deep geothermal plants in operation
- 4 Deep geothermal plants under construction
- About 30 deep geothermal plants in planning
- 315 MW thermal, 35 MW electrical

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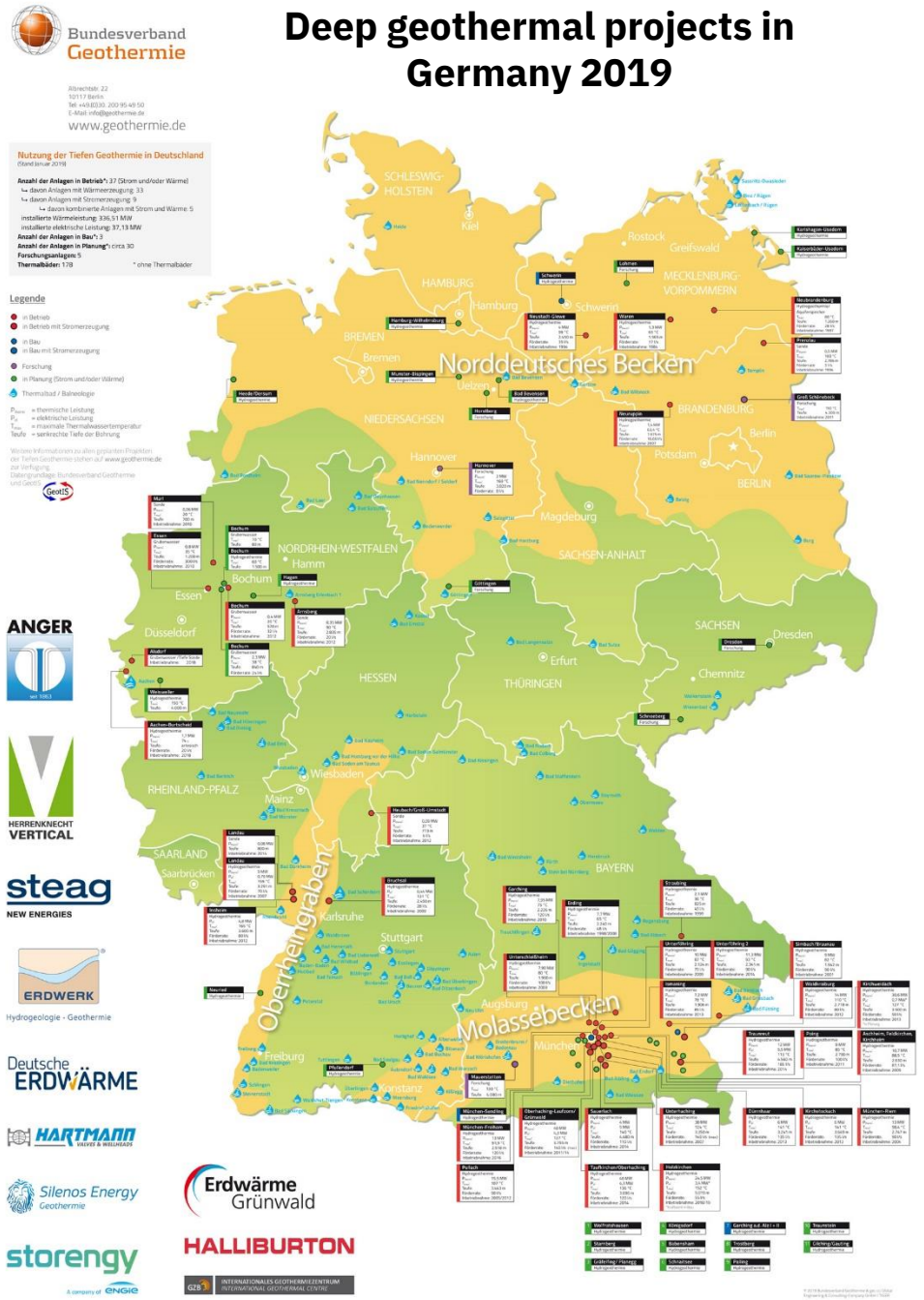
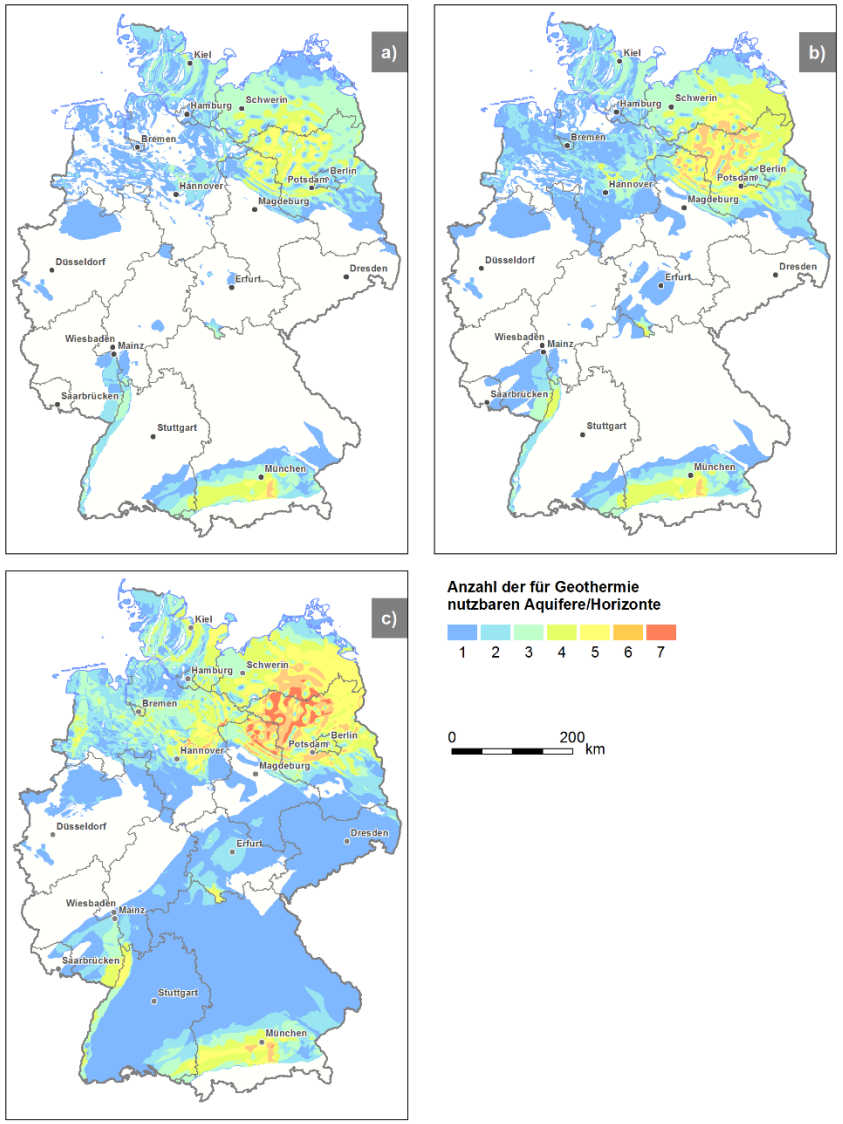
Deep geothermal projects in Germany 2019



Utilization horizons hydrothermal and petrothermal



The geothermal potentials can be exploited technically in up to 7 superimposed utilisation horizons.

With the help of stimulation measures, artificial heat exchangers can also be created. This would allow deep geothermal energy to be used across the board.

Source: LIAG, Georg-August-Universität Göttingen

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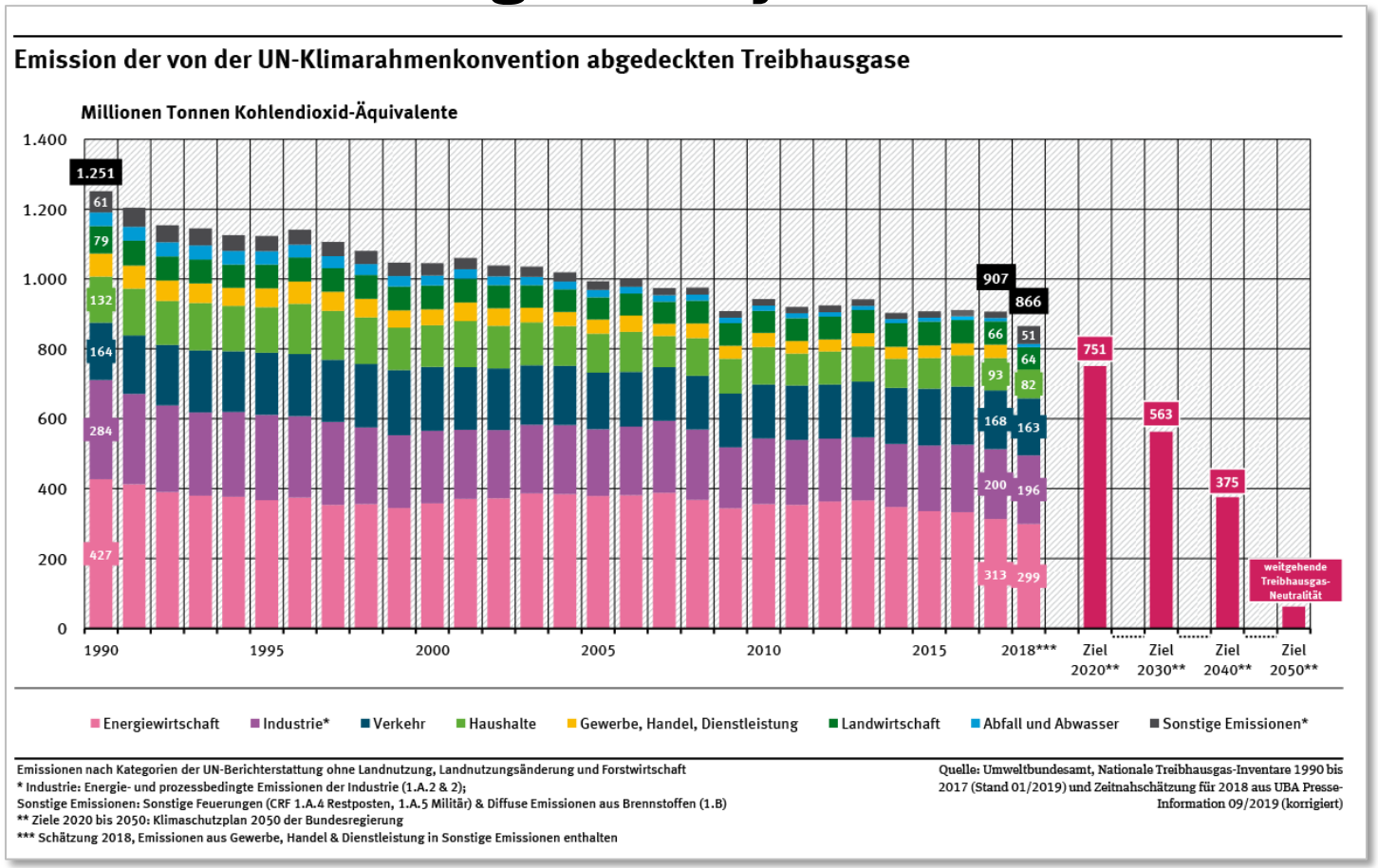
Climate Protection Plans

Bundesverband Geothermie

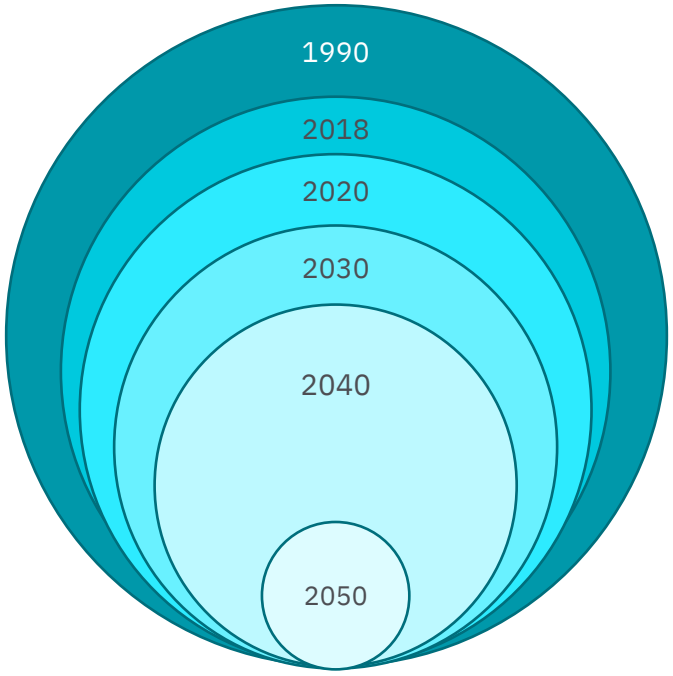
Climate goals: Are we on a good way?



Quelle: Umweltbundesamt

Climate Goals of the national government

- 1990: 1251 t CO_2-Äquivalent = comparing value
- 2018*: 866 t CO_2-Äqu. **- 31 %**
- 2020: 751 t CO_2-Äqu. **- 40 %**
- 2030: 563 t CO_2-Äqu. **- 55 %**
- 2040: 375 t CO_2-Äqu. **- 70 %**
- 2050: 63 t CO_2-Äqu. **- 80-95 %**



*estimation

Data: Umweltbundesamt

Bundesverband Geothermie

GtV Service GmbH

Gregor Dilger

GtV Service GmbH
subsidiary company of German Geothermal Association (Bundesverband Geothermie)

Albrechtstraße 22
10117 Berlin
Germany

Tel: +49.(0)30 / 847 12 12 80
Fax: +49.(0)30 / 847 12 12 89

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