

The REFLECT European Geothermal Fluid Atlas dataset (<https://doi.org/10.5880/fidgeo.2025.088>)

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2. Citation

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The data are the background database of the European Geothermal Fluid Atlas established during the REFLECT projects (REFLECT - Redefining geothermal fluid properties at extreme conditions to optimize future geothermal energy extraction).

Table of Contents

1.	Licence.....	1
2.	Citation	1
3.	Data description	2
3.1.	<i>The REFLECT geothermal fluid dataset and the REFLECT European Fluid Atlas</i>	2
3.2.	<i>Sampling method.....</i>	3
3.2.1	<i>The REFLECT database - Data collection and sampling campaigns</i>	3
3.2.2	<i>Quality flagging</i>	5
3.2.3	<i>The European Fluid Atlas (EFA)</i>	5
4.	File description	6
4.2	<i>File inventory</i>	6
4.3	<i>Description of data tables.....</i>	6
4.3.1	<i>2025-088_Kovacs-et-al_REFLECT_data.xlsx</i>	6
	Well data	7
	Fluid sample data	7
	Rock sample data	9
	Reservoir data	10
4.3.2	<i>EFA download: REFLECT_Horizon_2020-Data_Export_2025-09-24_19-47-40.xlsx</i>	11
	Fluid-well data export	11
	Rock-well data export	14
	Reservoir well data export	15
5	Further developments on the dataset	15
	References	15
	Database References	16

3. Data description

3.1. The REFLECT geothermal fluid dataset and the REFLECT European Fluid Atlas

The dataset was generated by the Horizon2020 project REFLECT (Redefining geothermal fluid properties at extreme conditions to optimize future geothermal energy extraction). The aim was to help operators to assess what kind of fluids might be expected at a certain location, and thus have an improved view of the associated risks when installing a geothermal power plant.

Fluid data have been collected from 21 European countries. If available, data of corresponding wells, rocks, and reservoirs were also integrated. The focus was on fluids used for electricity generation (> 100 °C), but some data from heat projects were included, too.

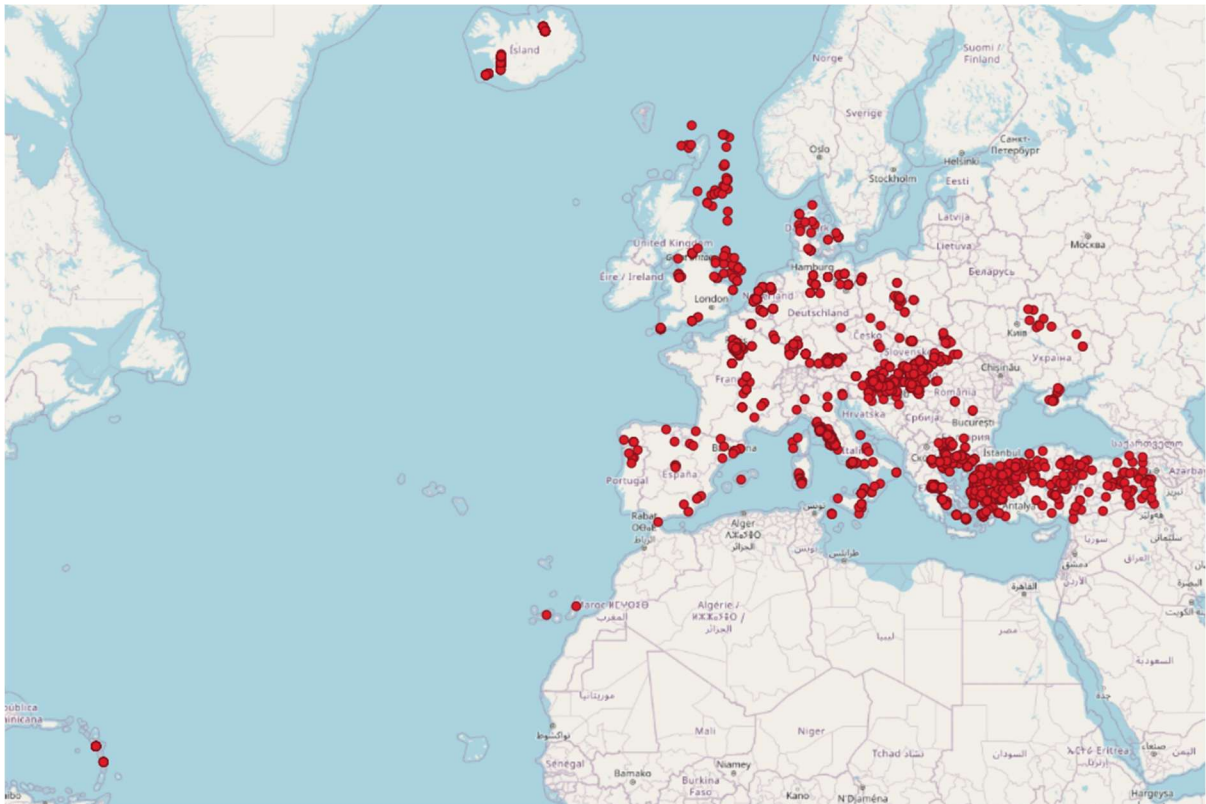


Figure 1: Location of geothermal wells contained in The European Fluid Atlas

The dataset is the result of a European wide data collection of legacy data (scientific publications, reports, datasets, and documents in national archives) and data from field measurements and sampling campaigns implemented by the project partners. To harmonise the work of the data providers a detailed template was developed. The aim of data collection was to collect as much geological, geochemical, and environmental characteristics as possible of all sites. The database consists of four different data types: The **well** data sheet contains the geographic coordinates and technical details of the well. The **fluid** and **rock** data sample sheets correspond to a given borehole of a given **reservoir**.

In this publication, we report on two sets of data: (1) the REFLECT database in its original form, which includes data entries as provided by the different data providers (including non-numeric values, ranges of values, or indicators of detection limits such as “<0,5mg/l”); (2) the dataset of the REFLECT European Fluid Atlas (EFA), for which non-numeric values have been removed, remarks on detection limits have been moved to the “remarks” column, ranges have been transferred to average values. The EFA dataset was mainly prepared in this way to allow for query of the data. In the following, we describe each dataset separately.

3.2 Sampling method

3.2.1 The REFLECT database - Data collection and sampling campaigns

The first data collection campaign providing the most data entries was implemented by the national member geological associations of the European Federation of Geologists (EFG). They collected publicly available data at national level from 20 European countries: Belgium, Bulgaria, Croatia, Czech Republic, Denmark, France, Germany, Greece, Hungary, Italy, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Turkey, UK, and Ukraine. The amount of data from different countries varies greatly. One reason comes from the different geothermal potential of the examined countries. The other reason is that the regulations of the data accessibility is different in each country (Table 1).

The broad scope and wide geographical coverage of the data collection showed how different the national datasets are. The purpose of measurements, the analytical methods, the applied units, and data series are different in each region. Due to the different geochemical properties of reservoirs, fluid chemical properties alter widely.

The template was developed for a broad data collection, but the entries show that experts working on the database development wanted to include more detailed information. This resulted in an unharmonized database, and unfitting entries. To run statistical analysis on the database, and to make it applicable for query and visualization, the primary task was to transform string entries into numeric format. During the transformation, certain amount of extra information was lost. For this reason, in this data publication we publish the original dataset, on which we only made the harmonization of the units, correction of coordinates and typos. Also, there was a data correction campaign by experts after publishing the European Fluid Atlas. All experts within the reach of the project partners were asked to use the Atlas and check the entries. This resulted in the correction of coordinates, geological information, and some of the fluid properties too. These corrections are included in this published database. Despite of these corrections, this part of the dataset (resulting from the data collection through national associations, hence many different data contributors) is the most prone to mistakes, being datamined legacy data from very different type of documents, articles, drilling logs etc.

Country	English name of the national member organization of EFG	Number of well entries	Number of fluid entries	Number of rock entries	Number of reservoir entries
Belgium	Belgo-Luxembourg Union of Geologists	8	28	27	8
Greece	Association of Greek Geologists	566	566	0	0
Luxembourg	Belgo-Luxembourg Union of Geologists	4	4	4	4
Bulgaria	Bulgarian Geological Society	14	0	14	14
Croatia	Croatian Geological Society	12	9	0	12
Czech Republic	Czech Association of Economic Geologists	5	5	5	5
Hungary	Hungarian Geological Society	167	493	14	16
Italy	Italian National Council of Geologists	948	0	0	50
Romania	National Assoc. of Professionals in Geology and Mining	29	26	0	0
Spain	Official Spanish Association of Professional Geologists	42	42	42	42
Poland	Polish Association of Minerals Asset Valuers	33	12	30	27

Portugal	Portuguese Association of Geologists	5	5	0	5
Slovenia	Slovenian Geological Society	48	27	14	6
Turkey	Turkish Association of Economic Geologists	254	254	0	0
Ukraine	Ukrainian Association of Geologists	50	50	0	0
Denmark	Expert	19	37	20	21
France	Expert	23	24	0	23
Germany	Bundesanstalt für Geowissenschaften und Rohstoffe	95	155	25	69
Netherlands	Expert	78	47	15	15
UK	Expert	291	0	0	0
	Total:	2691	1784	210	317

Table 1. Results of data collection implemented by EFG national partner organizations

The second part of the dataset results from a data collection implemented by the REFLECT project partners. Partners collected formerly existing data from literature, mostly limited to the sampling sites defined by the REFLECT project, but also from other geothermal sites in their countries, by this the number of countries covered by data collection was extended to 21. (Table 2.) This part is the most reliable legacy data of the database. Project partners were already prepared and informed of all the difficulties of harmonized data collection and are organizations familiar with geothermal resources.

Country	Name of the project partner	Number of well entries	Number of fluid entries	Number of rock entries	Number of reservoir entries
Iceland	Islenskar Orkurannsóknir	66	875	59	0
Germany	GFZ Helmholtz-Zentrum für Geoforschung	95	159	26	74
France	Bureau de Recherches Géologiques et Minières	29	422	11	29
Turkey	Izmir Institute of Technology	254	233		2
UK	United Kingdom Research and Innovation	12	149	36	
Total:		456	1838	132	103

Table 2. Results of data collection implemented by project partners.

The six project partners involved in the fluid sampling, carried out also on-site measurements. 11 fluid sampling sites were identified from 7 countries (Table 3). The collected fluid samples were analysed in laboratories of the GFZ Helmholtz Centre for Geosciences, of Hydroisotop GmbH, of the Izmir Institute of Technology, and of the Bureau de Recherches Géologiques et Minières laboratory.

Country	Name of the project partner	Sampling site	Number of well entries	Number of fluid entries	Number of rock entries
France	Bureau de Recherches Geologiques et Minieres	Bouillante	1	6	
Germany	Hydroisotop GmbH	Bad Blumau	3	17	
		Insheim	2	6	
Germany	GFZ Helmholtz-Zentrum für Geoforschung	Groß Schönebeck	2	5	
		Neustadt-Glewe	2	3	
The Netherlands	Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek	Heemskerk	2	4	
Iceland	Islenskar Orkurannsoknir	Krafla	8	8	
		Theistareykir	3	9	
Turkey	Izmir Institute of Technology	Aydin	12	14	22
		Tuzla	4	6	7
UK	United Kingdom Research and Innovation	United Downs		2	
Total:			39	80	29

Table 3. Results of sampling campaign implemented by project partners.

This part of the database is the most complete set of data, covering many entries. Fluid sampling by the project partners was carried out in 2020 and 2021, until November 2021. This resulted in dataset entries from newly sampled fluids by local experts, analysed in high quality laboratories.

3.2.2 Quality flagging

The data entries are flagged line by line based on the data source. Old legacy data collected by EFG national partner organizations got “C” flags, if reliable references are indicated “C1” if references are missing “C2” flag marks the untraceable source of data.

Entries of data collection carried out by project partners marked by flag “B” and as above B1/B2 marks the traceability.

Newly sampled fluid properties are marked with flag “A”.

There are subsets of the data which got higher quality score, not following the above-mentioned rule. These subsets were checked by local experts during the project duration.

3.2.3 The European Fluid Atlas (EFA)

The European Fluid Atlas (EFA) is an on-line query and visualization toolset for the Pan-European geothermal well-fluid-rock-reservoir dataset, which was collected throughout the REFLECT project. The dataset available through the European Fluid Atlas (<https://www.reflect-h2020.eu/efa/>) had to be transformed and lost some extra information compared to the one explained above.

To prepare the database to serve the purposes of the Fluid Atlas the following errors were corrected:

- coordinate errors for wells;
- incorrect identifiers for fluid and rock samples, and reservoir properties;
- non-numeric entries for numeric attributes;
- entries out of the listed options;
- entries with units other than required;
- typos.

When it was impossible to fix the coordinate error the entire line was excluded. Identifiers were essential to link well-fluid-rock and reservoir data. They were created for all entries and, additionally, local/original identifiers were kept for local experts.

The correction of non-numeric entries and entries out of the listed options were inevitable for the preparation of the query tool, but data loss was inherent. There were three types of non-numeric entries for numeric columns:

- the entry had a different unit than the template required and the unit was indicated along with the value. If the unit was indicated and convertible, simple conversion was done. If the units were not convertible the entry was left “no data” and moved to “Remarks”. If the unit was not identifiable the data provider or the indicated reference document was reached for information and if there was no information on the unit, the entry was deleted (noData).
- the entry is below the laboratory measurement threshold (usually indicated by the sign “<”). In this case the entries got “0” value, interpreting measurement threshold as a very small value, and the original entry went to “Remarks”.
- along with the entry the depth was indicated. If it was only one entry the additional information was moved to “Remarks” column; in the case the entry was a list, the mean value was indicated as one numeric value, and the original entry was moved to “Remarks”.

When there were entries out of the listed options, but it was possible to identify as one of the listed entries the entry was simply corrected. If the entry was a new but adaptable option, the list was expanded. The selectable entries are indicated in the explanatory sheet.

4 File description

4.2 File inventory

- *2025-088_Kovacs-et-al_data-description.pdf*
- *2025-088_Kovacs-et-al_references.xlsx*
- *2025-088_Kovacs-et-al_REFLECT_data.xlsx*
- *REFLECT_Horizon_2020-Data_Export_2025-09-24_19-47-40.xlsx*

4.3 Description of data tables

4.3.1 2025-088_Kovacs-et-al_REFLECT_data.xlsx

The result of data collections and sampling campaigns are presented in the file *2025-088_Kovacs-et-al_REFLECT_data.xlsx*. The data is in its original format, including all notes of data providers. Units are converted and integrated, values checked (if it was possible), but string entries at numeric attributes (marks for remarks; complementary explanations; listing; uncertainty indications) are not converted to numeric values. The aim of this is not to lose the extra information added by data provider.

Hereby the data are provided as 4 Excel worksheets, one for each set:

- **Well** data
- **Fluid** sample data
- **Rock** sample data
- **Reservoir** data

Columns of the sheets are as indicated below:

Well data

Column header	Unit	Description
Well ID		
Local ID for the well		
Latitude/ Northing	decimal degrees	WGS 84 coordinate system
Longitude/ Easting	decimal degrees	WGS 84 coordinate system
Country		
Date of well completion	year	
Wellhead elevation	m (amsl)	Above mean see level
Surface elevation	m (amsl)	Above mean see level
Well depth	m	distance between wellhead and bottom of well (positive number), measured along the well
Top of screened interval	m	m, below wellhead
Bottom of screened interval	m	m, below wellhead
Reservoir ID		Listed, if there are multiple within a well.
Hydraulic head	m (amsl)	Derived as $p/(\rho g)$
PZ data	Pa/m	Pressure (P) change along a vertical axis (Z), given as the gradient of the pore pressure: how the pressure is changing over a unit depth: $(P_2-P_1)/(Z_2-Z_1)$; Some entries contain the depth of the gradient.
Bottomhole temperature	°C	
Outflow temperature	°C	
Well yield	m ³ /hour	
Scaling exists		Yes / No
Inhibitor added		Yes / No
Geothermal gradient in well	°C/m	
References for the data		link/DOI/ISBN/ISSN/national archive identifier; listed if multiple
Remarks		

Table 4. Column description of "Well" worksheet

Fluid sample data

	Column header	Unit	Description
Fluid sample identification	Well ID		
	Fluid sample ID		
	Local ID for fluid sample		
	Sampling method		Entries from the list: Freeflow, Pumping, Pointwise (with bailer), Pumping with packers, Gas-lift test, fluid inclusion method.
	Sample depth		m below wellhead, interval if packers used
	Sampling date and hour		
	Analysis date		
Fluid sample	Dominant phase		Entries from the list: Liquid, Gas, Condensate, Two-phase
	Temperature	°C	Temperature of the fluid sample
	Pressure	Pa	Pressure at the sampling depth

	Hydraulic head	m	At the sampling depth, given in [m amsl] as $h_0 + p/(\rho g)$. It is calculated from the mean sea level.	
	Density	kg/dm ³	Density of fluid sample	
	Kinematic viscosity	m ² /s	Kinematic viscosity of fluid sample	
	Dynamic viscosity	kg/m/s	Dynamic viscosity of fluid sample	
	Specific heat capacity	J/K/kg		
	Electrical conductivity	μS/cm, EC25		
Fluid sample chemical properties	On site	pH	-	
		Dissolved oxygen	mg/L	
		Eh	mV	Redox potential
		Alkalinity	meq/L	Total or carbonate alkalinity
		TDS	mg/L	Total Dissolved Solid
		TDG	Nml/kg	Total dissolved gas in [Normal ml/kg H ₂ O]
		GLR	-	Gas/Liquid Ratio
	Dissolved major cations	Ca	mg/L	
		Mg	mg/L	
		Na	mg/L	
		K	mg/L	
		TMC	mg/L	Total Major Cations. Value must be approximately the sum of the major cations listed above.
	Dissolved major anions	Cl	mg/L	
		S	mg/L	
		F	mg/L	
		CO ₃	mg/L	
		HCO ₃	mg/L	
		SO ₄	mg/L	
		PO ₄	mg/L	
		HBO ₂	mg/L	
		TMA	mg/L	Total Major Anions. Value must be approximately the sum of the major anions listed above.
		Si	mg/L	Dissolved silica
	Dissolved trace elements	Br	mg/L	
		B	mg/L	
		I	mg/L	
		Al	mg/L	
		Fe	mg/L	
		Mn	mg/L	
		Sr	mg/L	
		Ba	mg/L	
		Li	mg/L	
		Cs	mg/L	
		Rb	mg/L	
		Ge	mg/L	
		Zn	mg/L	
		Cu	mg/L	
Pb		mg/L		
Ni		mg/L		
As		mg/L		
Ag		mg/L		
Co		mg/L		
Cr	mg/L			

		Hg	mg/L	
		W	mg/L	
	Organics and petroleum components	TOC	mg/L	Total Organic Carbon
		DOC	mg C/L	Dissolved organic carbon; mg C/L (C = organic carbon)
		TPH	mg/L	Total Petroleum Hydrocarbon
		BTEX	mg/L	Benzene, Toluene, Ethylbenzene and Xylene
		Formate	mg/L	
		Acetate	mg/L	
		Propionate	mg/L	
	Dissolved gas	CO ₂	Vol%	Volume % of the total dissolved (gas TDS) as 100%
		O ₂	Vol%	Volume % of the total dissolved (gas TDS) as 100%
		H ₂ S	Vol%	Volume % of the total dissolved (gas TDS) as 100%
		N ₂	Vol%	Volume % of the total dissolved (gas TDS) as 100%
		CH ₄	Vol%	Volume % of the total dissolved (gas TDS) as 100%
		Ar	Vol%	Volume % of the total dissolved (gas TDS) as 100%
		H ₂	Vol%	Volume % of the total dissolved (gas TDS) as 100%
		He	Vol%	Volume % of the total dissolved (gas TDS) as 100%
	Isotopes	Oxygen-18	‰	
		Deuterium (² H)	‰	
		Tritium (³ H)	Bq/L	
		Oxygen-18 (SO ₄)	‰	
		Sulfur-34 (SO ₄)	‰	
		Sulfur-34 (H ₂ S)	‰	
		Carbon-13 (CO ₂)	‰	
		Lithium-7	‰	
		Boron-11	‰	
		⁸⁷ Sr/ ⁸⁶ Sr	‰	
References for the data	link/DOI/ISBN/ISSN/national archive identifier; listed if multiple			
Remarks				

Table 5. Column description of "Fluid" worksheet

Rock sample data

	Column header	Unit	Description
Rock sample identification	Well ID		
	Rock sample ID		
	Local ID for rock sample		
	Sampling method		
	Sample depth	m	Depth below wellhead;
	Sampling date	year	
	Analysis date	year	

Rock sample geological information	Rock type		Entries from the list: Granite; Granodiorite; Tonalite; Syenite; Monzonite; Diorite; Gabbro; Peridotite; Pyroxenite; Hornblendite; Carbonatite; Rhyolite; Trachyte; Dacite; Andesite; Basalt; Alkali basalt; Ultramafic volcanic rock; Rhyolitic volcaniclast; Dacitic volcaniclast; Andesitic volcaniclast; Basaltic volcaniclast; Marble; Quartzite; Slate; Phyllite; Schist; Gneiss; Granulite; Hornfels; Greenschist; Serpentinite; Amphibolite; Eclogite; Migmatite; Pelite; Psammite; Arcose; Psephite; Conglomerate; Breccia; Carbonatic siliciclastic rock; Marl; Dolomite; Micritic limestone; Sparitic limestone; Biolithite; Bioclastic rock; Fresh-water carbonate rock; Sulphate salt rock; Chloride salt rock; Nitrate salt rock; Borate salt rock; Mixed salt rock; Chert; Phosphorite; Coal; Oil shale; Iron ore; Manganese ore; Alumina ore; Non-ferrous metal ore
	Mineralogical composition		List of the main minerals
	Formation name		Name of the formation which the rock sample belongs to
	Formation code on geological map		
	Link to geological map		
Rock sample physical properties	Hydraulic conductivity	m/s	
	Permeability	m ²	
	Porosity	Vol%	
	Heat capacity	J/K/kg	
	Thermal conductivity	W/m/K	
References for the data		link/DOI/ISBN/ISSN/national archive identifier; list if multiple	
Remarks			

Table 6. Column description of "Rock" worksheet.

Reservoir data

Column header	Unit	Description
Well ID in reservoir		Listed when multiple
Reservoir ID		
Local name/ID of reservoir		The local name, following local approaches
Name of geological formation as reservoir		Reservoir or other stratigraphic, hydrostratigraphic units
Age of formation		Entries from the list: Quaternary; Neogene; Paleogene; Cretaceous; Jurassic; Triassic; Permian; Carboniferous; Devonian; Silurian; Ordovician; Cambrian; Precambrian
Formation code on geological map		

Link to geological map		
Underlying unit		Name of geological formation
Formation code for underlying unit on geological map		
Hydrogeologic role of underlying unit		Entries from the list: Aquifer/Aquitard/Aquiclude
Overlying unit		Name of geological formation
Formation code for overlying unit on geological map		
Hydrogeologic role of overlying unit		Entries from the list: Aquifer/Aquitard/Aquiclude
Reservoir type		Entries from the list: Porous, Karstic, Fractured, Double porosity
Depth interval below wellhead	m to m	
Lateral extent	km ²	Approximate value
Link to GIS information if available		Information on lateral extent, top and bottom depth, properties distribution
Fluid phases in reservoir		Entries from the list: Liquid/Gas/Supercritical
Average hydraulic conductivity	m/s	Average hydraulic conductivity of the reservoir
Average permeability	m ²	Average permeability of the reservoir
Average hydraulic heads	m amsl	Hydraulic head derived as p/(ρg)
Average hydraulic gradient	m/m	Average hydraulic gradient along the reservoir
Average temperature	°C	Average temperature within the reservoir
Average geothermal gradient	°C/m	Average geothermal gradient of the reservoir
References for the data		link/DOI/ISBN/ISSN/national archive identifier; listed if multiple
Remarks		

Table 7. Column description of “Reservoir” worksheet.

4.3.2 EFA download: REFLECT_Horizon_2020-Data_Export_2025-09-24_19-47-40.xlsx

At the time of writing this description, the data is available through the European Fluid Atlas website (<https://www.reflect-h2020.eu/efa/>). Using the “Export data” button the result of the queries of both selecting tools (Select by attributes/Select by draw) can be downloaded. The version published here in this data publication is the download as of 24 September 2025, 19:47: *REFLECT_Horizon_2020-Data_Export_2025-09-24_19-47-40.xlsx*. The downloaded report’s format is an Excel worksheet which contains the fluid, the rock and reservoir data linked to the wells, explanatory worksheets for each and a map image export on different tabs, as follows:

Fluid-well data export

Column header	Description
fluid_sample_id	Fluid sample ID
well_id	Well ID
local_id_f	Local ID for fluid sample
latitude_	Latitude/ Northing
longitude_	Longitude/ Easting
country	Country
powpl_name	Power plant's name
nuts2_name	Nomenclature of territorial units for statistics / Regions
nuts3_name	Nomenclature of territorial units for statistics / Counties
date_of_well_completion_year	Date of well completion (year)

wellhead_elevation_m_amsl	Wellhead elevation (m, amsl)
surface_elevation_m_amsl	Surface elevation (m, amsl)
well_depth_m	Well depth (m)
top_of_screened_interval_m_below_wellhead	Top of screened interval (m, below wellhead)
bottom_of_screened_interval_m_below_wellhead	Bottom of screened interval (m, below wellhead)
reservoir_id_list_if_multiple	Reservoir ID (list, if multiple)
hydraulic_head_m_amsl	Hydraulic head (m, amsl)
pz_data_pa_per_m	Pressure (P) change along a vertical axis (Z), given as the gradient of the pore pressure: how the pressure is changing over a unit depth: $(P2-P1)/(Z2-Z1)$ [Pa/m].
bottomhole_temperature_c	Bottomhole temperature (°C)
outflow_temperature_c	Outflow temperature (°C)
well_yield_m3_per_hour	Well yield (m3/hour)
scaling_exists_y_or_n	Scaling exists (Y/N)
inhibitor_added_y_or_n	Inhibitor added (Y/N)
geothermal_gradient_in_well_c_per_m	Geothermal gradient in well (°C/m)
references_for_the_data	References for the data (link/DOI/ISBN/ISSN/national archive identifier; list if multiple)
remarks_well	Remarks
local_id_for_fluid_sample	Local ID for fluid sample
sampling_method	Sampling method (Freeflow/Pumping/Pumping with packers/Pointwise (with bailer))
sample_depth	m below wellhead, interval if packers used
sampling_date	Sampling date and hour
analysis_year	Analysis date
dominant_phase	Dominant phase: Liquid/Gas/Supercritical
temperature_c	Temperature (°C)
pressure_pa	Pressure (Pa) - at the sampling depth
hydraulic_head_m	Hydraulic head (m) - At the sampling depth, given in m amsl as $h_0 + p/(\rho g)$
density_kg_per_dm3	Density (kg/dm ³)
kinematic_viscosity_m2_per_s	Kinematic viscosity (m ² /s)
dynamic_viscosity_kg_per_m_per_s	Dynamic viscosity (kg/m/s)
specific_heat_capacity_j_per_k_per_kg	Specific heat capacity (J/K/kg)
electrical_conductivity_us_per_cm_ec25	Electrical conductivity (µS/cm, EC25)
ph	pH - on site measurement
dissolved_oxygen_mg_per_l	Dissolved oxygen (mg/L) - on site measurement
eh_mv	Eh (mV) - on site measurement
alkalinity_meq_per_l	Alkalinity (meq/L) - on site measurement
tds_mg_per_l	Total Dissolved Solid (mg/L)
tdg_nml_per_kg	Total dissolved gas in Normal ml/kg H2O
glr	Gas/Liquid Ratio
ca_mg_per_l	Dissolved major cations (mg/L) - Ca
mg_mg_per_l	Dissolved major cations (mg/L) - Mg
na_mg_per_l	Dissolved major cations (mg/L) - Na
k_mg_per_l	Dissolved major cations (mg/L) - K

tmc	Dissolved major cations (mg/L) - Total Major Cations
cl_mg_per_l	Dissolved major anions (mg/L) - Cl
s_mg_per_l	Dissolved major anions (mg/L) - S
f_mg_per_l	Dissolved major anions (mg/L) - F
co3_mg_per_l	Dissolved major anions (mg/L) - CO ₃
hco3_mg_per_l	Dissolved major anions (mg/L) - HCO ₃
so4_mg_per_l	Dissolved major anions (mg/L) - SO ₄
po4_mg_per_l	Dissolved major anions (mg/L) - PO ₄
hbo2_mg_per_l	Dissolved major anions (mg/L) - HBO ₂
tma	Dissolved major anions (mg/L) - Total Major Anions
si_mg_per_l	Dissolved silica (mg/L)
br_mg_per_l	Dissolved trace elements (mg/L) - Br
b_mg_per_l	Dissolved trace elements (mg/L) - B
i_mg_per_l	Dissolved trace elements (mg/L) - I
al_mg_per_l	Dissolved trace elements (mg/L) - Al
fe_mg_per_l	Dissolved trace elements (mg/L) - Fe
mn_mg_per_l	Dissolved trace elements (mg/L) - Mn
sr_mg_per_l	Dissolved trace elements (mg/L) - Sr
ba_mg_per_l	Dissolved trace elements (mg/L) - Ba
li_mg_per_l	Dissolved trace elements (mg/L) - Li
cs_mg_per_l	Dissolved trace elements (mg/L) - Cs
rb_mg_per_l	Dissolved trace elements (mg/L) - Rb
ge_mg_per_l	Dissolved trace elements (mg/L) - Ge
zn_mg_per_l	Dissolved trace elements (mg/L) - Zn
cu_mg_per_l	Dissolved trace elements (mg/L) - Cu
pb_mg_per_l	Dissolved trace elements (mg/L) - Pb
ni_mg_per_l	Dissolved trace elements (mg/L) - Ni
as_mg_per_l	Dissolved trace elements (mg/L) - As
ag_mg_per_l	Dissolved trace elements (mg/L) - Ag
co_mg_per_l	Dissolved trace elements (mg/L) - Co
cr_mg_per_l	Dissolved trace elements (mg/L) - Cr
hg_mg_per_l	Dissolved trace elements (mg/L) - Hg
w_mg_per_l	Dissolved trace elements (mg/L) - W
toc_mg_per_l	Total organic carbon - mg C/L (C = organic carbon)
tph_mg_per_l	Dissolved organic carbon - mg C/L (C = organic carbon)
btex_mg_per_l	Benzol, Toluol, Ethylbenzol, Xylol - mg/L
co2_vol_perc	CO ₂ - ppmV
o2_vol_perc	O ₂ - ppmV
h2s_vol_perc	H ₂ S - ppmV
n2_vol_perc	N - ppmV
ch4_vol_perc	CH ₄ - ppmV
ar_vol_perc	Ar - ppmV
h2_vol_perc	H ₂ - ppmV
he_vol_perc	He - ppmV
oxigen_18_thousandths	Isotopes (‰) -Oxigen-18
deuterium_2h_thousandths	Isotopes (‰) -Deuterium (² H)
tritium_3h_thousandths	Isotopes (‰) -Tritium (³ H) - Bq/L
oxigen_18_so4_thousandths	Isotopes (‰) -Oxigen-18 (SO ₄)

sulfur_34_so4_thousandths	Isotopes (‰) -Sulfur-34 (SO ₄)
sulfur_34_h2s_thousandths	Isotopes (‰) -Sulfur-34 (H ₂ S)
carbon_13_co2_thousandths	Isotopes (‰) -Carbon-13 (CO ₂)
lithium_7_thousandths	Isotopes (‰) -Lithium-7
boron_11_thousandths	Isotopes (‰) -Boron-11
strontium_87sr_per_86sr_thousandths	Isotopes (‰) -87Sr/86Sr
references_for_fluid_data	References for the data (link/DOI/ISBN/ISSN/national archive identifier; list if multiple)
remarks_fluid	Remarks

Table 8. Column description of “Fluid-well_data-export” worksheet.

Rock-well data export

Column header	Description
well_id	Well ID
local_id_f	Local ID for fluid sample
latitude_	Latitude/ Northing
longitude_	Longitude/ Easting
country	Country
powpl_name	Power plant's name
nuts2_name	Nomenclature of territorial units for statistics / Regions
nuts3_name	Nomenclature of territorial units for statistics / Counties
rock_sample_id	Rock sample ID
local_id_for_rock_sample	Local ID for rock sample
sampling_method	Sampling method
sample_depth_m	Sample depth (m below wellhead; interval if packers used)
sampling_year	Sampling date (year)
analysis_year	Analysis date (year)
rock_type	Rock type
mineralogical_composition	Mineralogical composition
formation_name	Formation name
formation_code_on_geological_map	Formation code on geological map
link_to_geological_map	Link to geological map
hydraulic_conductivity_m_per_s	Hydraulic conductivity (m/s)
permeability_m2	Permeability (m ²)
porosity	Porosity
heat_capacity_j_per_k_per_kg	Heat capacity (J/K/kg)
thermal_conductivity_w_per_m_per_k	Thermal conductivity (W/m/K)
references_for_the_rock_data	References for the data (link/DOI/ISBN/ISSN/national archive identifier; list if multiple)
remarks_rock	Remarks

Table 9. Column description of “Rock-well_data-export” worksheet.

Reservoir well data export

Column header	Description
hydrogeologic_role_of_underlying_unit	Hydrogeologic role of underlying unit (Aquifer/Aquitard/Aquiclude)
overlying_unit_name_of_geological_formation	Overlying unit (name of geological formation)
formation_code_for_overlying_unit_on_geological_map	Formation code for overlying unit on geological map
hydrogeologic_role_of_overlying_unit	Hydrogeologic role of underlying unit (Aquifer/Aquitard/Aquiclude)
reservoir_type	Reservoir type (Porous/Karstic/Fractured/Double porosity)
depth_interval_below_wellhead_m_to_m	Depth interval below wellhead (m-m)
lateral_extent_km2	Lateral extent (km ²)
link_to_gis_information_if_available	Link to GIS information if available
fluid_phases_in_reservoir	Fluid phases in reservoir (Liquid/Gas/Supercritical)
average_hydraulic_conductivity_m_per_s	Average hydraulic conductivity (m/s)
average_permeability_m2	Average permeability (m ²)
average_hydraulic_heads_m	Average hydraulic heads (m)
average_hydraulic_gradient	Average hydraulic gradient
average_temperature_c	Average temperature (°C)
average_geothermal_gradient_c_per_m	Average geothermal gradient (°C/m)
references_for_the_reservoir_data	References for the data (link/DOI/ISBN/ISSN/national archive identifier; list if multiple)
remarks_reservoir	Remarks

Table 10. Column description of “Reservoir-well_data-export” worksheet.

5 Further developments on the dataset

The lessons learned from the European geothermal data collection resulted in an on-line data collection platform, which will be published in 2024-2025. The platform is developed throughout the CRM Geothermal project (<https://crm-geothermal.eu/>) and will be joined to a map-based visualization and query frontend like the European Fluid Atlas.

The platform contains unit converter algorithms, entry check to prevent typos and possibilities to add remarks to every numeric entry, to keep it numeric inside the database. It has the capability to process databases not only one-by-one entries.

References

Hartai, É., Madarász, T., Kovács, K., Seres, A., Fekete, Zs. (2021): The H2020 REFLECT project: Deliverable 3.2 - Data compilation by REFLECT partners, GFZ German Research Centre for Geosciences. <https://doi.org/10.48440/gfz.4.8.2021.004>

Sanchez Miravalles, A., Hartai, É. (2021): The H2020 REFLECT project: Deliverable 3.1 - Report on the collection of data on geothermal fluids at a European level, GFZ German Research Centre for Geosciences. <https://doi.org/10.48440/gfz.4.8.2021.001>

Kovács, K., Seres, A., Hartai,É., The H2020 REFLECT project: Deliverable 3.2 – The REFLECT European Fluid Atlas, GFZ German Research Centre for Geosciences. <https://doi.org/10.48440/gfz.4.8.2023.002>

Database References

- Aardwarmte Ce-Ren Beheer B.V.: https://www.nlog.nl/sites/default/files/2021-01/190502_verzoek_tot_instemming_wp_heemskerker_publiek_gelakt.pdf [15.05.2025]
- Abbott, J. H. L., & Slater, D. (Eds.). (1992). United Kingdom oil and gas fields: 25 years commemorative volume (Geological Society Memoir No. 14). Geological Society of London. ISBN 0-903317-62-1
- Abou Akar, A.; Matray, J. M.; Brach, M.; Sanjuan, B.; Lasne, E.; Vaute, L.; Bellon, J. F.; Fabriol, H.; Guillou-Frottier, L. (1992): Geochemical study of the geothermal fluid of the BO-2 well (EDF power plant) and of thermal sources de Bouillante area (Guadeloupe), 'High Energy' project. Hydro-geochemical study of the Bouillante geothermal field (Guadeloupe). The Bouillante geothermal field of: Performance of the chemical tracing test between the BO-4 and BO-2 drillings (March-June 1998). Presentation of the results of the geochemical follow-up associated with this test. Geothermal field of Bouillante - synthesis of geophysical studies. Compilation and analysis of thermal data on the Bouillante geothermal field - First interpretations for the operation of the geothermal field, <https://inis.iaea.org/records/29f2v-b7c41>
- Administration du Cadastre et de la Topographie (ACT). (n.d.). *Geoportail Luxembourg*. <https://map.geoportail.lu/> [last accessed: 12.02.2026]
- Agemar, T., Alten, J., Ganz, B., Kuder, J., Kühne, K., Schumacher, S. & Schulz, R. (2014): The Geothermal Information System for Germany - GeotIS;€“ ZDGG Band 165 Heft 2, 129-144, <https://doi.org/10.1127/1860-1804/2014/0060>
- Agemar, T.; Alten, J.; Ganz, B.; Kuder, J.; Kühne, K.; Schumacher, S.; Schultz, R. (2014): The Geothermal Information System for Germany - GeotIS – ZDGG Journal of Applied and Regional Geology 165(2), 129-144. <https://doi.org/10.1127/1860-1804/2014/0060>
- Allen, D. J., Gale, I. N., & Price, M. (1985). Evaluation of the Permo-Triassic sandstones of the UK as geothermal aquifers.
- Andrews, J. N., Edmunds, W. M., Smedley, P. L., Fontes, J. C., Fifield, L. K., & Allan, G. L. (1994). Chlorine-36 in groundwater as a palaeoclimatic indicator: the East Midlands Triassic sandstone aquifer (UK). *Earth and Planetary Science Letters*, 122(1-2), 159-171. [https://doi.org/10.1016/0012-821X\(94\)90057-4](https://doi.org/10.1016/0012-821X(94)90057-4)
- Aquilina, L., Pauwels, H., Genter, A., & Fouillac, C. (1997). Water-rock interaction processes in the Triassic sandstone and the granitic basement of the Rhine Graben: Geochemical investigation of a geothermal reservoir. *Geochimica et Cosmochimica Acta*, 61(20), 4281–4295. [https://doi.org/10.1016/S0016-7037\(97\)00243-3](https://doi.org/10.1016/S0016-7037(97)00243-3)
- Aradillas, A.; Ínigo, j., M. (2004): *Balnearios de Espana*, Everest, ISBN:9788424104610
- Armannsson, H. (2010). IDDP. The chemistry of the Krafla geothermal system in relation to the IDDP well. In *Proceedings of the World geothermal congress*. <https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=adb2fccd07be1bc178e49072c22b26b1bb472cf0>
- Ármannsson, H., Fridriksson, T., Gudfinnsson, G. H., Ólafsson, M., Óskarsson, F., & Thorbjörnsson, D. (2014). IDDP—The chemistry of the IDDP-01 well fluids in relation to the geochemistry of the Krafla geothermal system. *Geothermics*, 49, 66-75. <https://doi.org/10.1016/j.geothermics.2013.08.005>
- Arnórsson, S. (1978). Major element chemistry of the geothermal sea-water at Reykjanes and Svartsengi, Iceland. *Mineralogical Magazine*, 42(322), 209-220. <https://doi.org/10.1180/minmag.1978.042.322.07>
- Arnórsson, S. (1978). Precipitation of calcite from flashed geothermal waters in Iceland. *Contributions to mineralogy and petrology*, 66(1), 21-28. <https://doi.org/10.1007/BF00376082>
- Arnórsson, S., & Andrésdóttir, A. (1995). Processes controlling the distribution of boron and chlorine in natural waters in Iceland. *Geochimica et Cosmochimica Acta*, 59(20), 4125-4146. [https://doi.org/10.1016/0016-7037\(95\)00278-8](https://doi.org/10.1016/0016-7037(95)00278-8)
- Arnórsson, S., Gunnlaugsson, E., & Svavarsson, H. (1983). The chemistry of geothermal waters in Iceland. II. Mineral equilibria and independent variables controlling water compositions. *Geochimica et Cosmochimica Acta*, 47(3), 547-566. [https://doi.org/10.1016/0016-7037\(83\)90277-6](https://doi.org/10.1016/0016-7037(83)90277-6)
- Arnórsson, S., Gunnlaugsson, E., & Svavarsson, H. (1983). The chemistry of geothermal waters in Iceland. III. Chemical geothermometry in geothermal investigations. *Geochimica et Cosmochimica Acta*, 47(3), 567-577. [https://doi.org/10.1016/0016-7037\(83\)90278-8](https://doi.org/10.1016/0016-7037(83)90278-8)
- Baba, A., Yuce, G., Deniz, O., & Ugurluoglu, D. Y. (2009). Hydrochemical and Isotopic Composition of Tuzla Geothermal Field (Canakkale-Turkey) and its Environmental Impacts. *Environmental Forensics*, 10(2), 144–161. <https://doi.org/10.1080/15275920902873418>
- Baltassat, J.-M.; Coppo, N.; Pajot, G.; Dupont, F. (2008): Magnetotelluric and gravimetric investigations of the geothermal potential in the Rosseau valley (Dominica, WI). <https://infoterre.brgm.fr/rapports/RP-56916-FR.pdf>
- Barazuoli, P.; Baroni, F.; Brogi, A.; Di Lella, L.A.; Fabbrini, L.; Frau, I.; Gaggi, C.; Gobbini, M.; Manzo, C.; Meccheri, M.; Montauti, A.; Munzi, S.; Nannoni, F.; Nicolardi, V.; Pisani, A.; Protano, G.; Riccobono, F.; Rossi, S.; Salleolini, M.; Salvini, R.; Scala, A. (2008): *Studio geostrutturale, idrogeologico e geochimico ambientale dell'area amiatina—Università degli Studi di Siena*. Report for Regione Toscana, p. 369.

- Barker, J. A., Downing, R. A., Gray, D. A., Findlay, J., Kellaway, G. A., Parker, R. H., & Rollin, K. E. (2000). Hydrogeothermal studies in the United Kingdom. *Quarterly Journal of Engineering Geology and Hydrogeology*, 33(1), 41-58. <https://doi.org/10.1144/qjgeh.33.1.41>
- Baujard, C.; Genter, A.; Dalmais, E.; Maurer, V.; Hehn, R.; Rosillette, R., Vidal, J., Schmittbuhl, J. (2017): Hydrothermal characterization of wells GRT-1 and GRT-2 in Rittershoffen, France: Implications on the understanding of natural flow systems in the rhine graben, *Geothermics*, 65., 255-268., <https://doi.org/10.1016/j.geothermics.2016.11.001>
- Baumgärtner, J.; Hettkamp, T.; Teza, D.; Kölbl, T.; Mergner, H.; Schlagermann, P. (2013) Betriebserfahrungen mit den Geothermiekraftwerken Landau, Insheim und Bruchsal. *bbr Leitungsbau, Brunnenbau, Geothermie* (64), pp. 48-57.
- Beichel, K., Koch, R., & Wolfgramm, M. (2014). Analysis of mud samples for the localization of inflow zones in geothermal wells. Example of the boreholes Gt Unterhaching 1/1a and 2 (Southern Germany, Molasse Basin, Malm). *Geological Journal of Northeast Bavaria*, 64 (1-4), 43-65. <https://www.researchgate.net/profile/Kilian-Beichel/publication/280491180>
- Bérard, T., & Loiseau, P. (2002). Étude géochimique des eaux thermales de la région de Vichy: Implications pour la circulation des fluides dans le sous-sol. *Bulletin de la Société Géologique de France*, 173(5), 539-550. <https://doi.org/10.2113/173.5.539>
- Berckmans, A., & Vandenberghe, N. (1998). Use and potential of geothermal energy in Belgium. *Geothermics*, 27(2), 235-242. [https://doi.org/10.1016/S0375-6505\(97\)10010-4](https://doi.org/10.1016/S0375-6505(97)10010-4)
- Berehannu, M. (2014). Geochemical interpretation of discharge from Reykjanes wells RN-29 and RN-32, SW-Iceland. United Nations University Geothermal Training Program. Reykjavik: United Nations University, pp. Reports, (19). <https://rafladan.is/bitstream/handle/10802/23969/UNU-GTP-2014-19.pdf?sequence=1>
- Bertin, C., & Rouzaire, D. (2004). Amélioration de la connaissance des ressources en eau souterraine des sites thermal en Auvergne—site du bassin de Vichy (03). Report t BRGM RP-53095-FR. chrome-extension://efaidnbmninnipocajpccgiclfefindmkaj/ <https://infoterre.brgm.fr/rapports/RP-53121-FR.pdf>
- Bertin, C.; Rouzaire, D. (2004): Amélioration de la connaissance des ressources en eau souterraine des sites thermaux en Auvergne – site du bassin de Vichy (03), Rapport BRGM RP-53095-FR, <https://infoterre.brgm.fr/rapports/RP-53095-FR.pdf>
- Bertleff, B., Joachim, H., Kozirowski, G., Leiber, J., Ohmert, W., Prestel, R., ... & Werner, J. (1988). Ergebnisse der Hydrogeothermiebohrungen in Baden-Württemberg. *Jh Geol Landesamt Baden-Württemb*, 30, 27-116.
- Bielec, B., & Kępińska, B. (2015). Instalacja w Skierniewicach—poligon badawczy miękkiego kwasowania jako metody poprawy i utrzymania chłonności w systemach geotermalnych. *Technika Poszukiwań Geologicznych*, 54. https://min-pan.krakow.pl/wydawnictwo/wp-content/uploads/sites/4/2017/12/7_2015.pdf
- Björnsson, S., Arnórsson, S., & Tómasson, J. (1972). Economic evaluation of Reykjanes thermal brine area, Iceland. *AAPG Bulletin*, 56(12), 2380-2391. <https://doi.org/10.1306/819A4224-16C5-11D7-8645000102C1865D>
- Blavoux, B.; Dazy, J. (1990): Caractérisation d'une province à CO2 dans le bassin du Sud-Est de la France, *Hydrogeologie*, 4., 241-252. https://www.oieau.fr/eaudoc/system/files/documents/5/27193/27193_doc.pdf
- Blöcher, G., Reinsch, T., Henniges, J., Milsch, H., Regenspurg, S., Kummerow, J., Francke, H., Kranz, S., Saadat, A., Zimmermann, G., Huenges, E. (2016): Hydraulic history and current state of the deep geothermal reservoir Groß Schönebeck; *Geothermics*, 63; 27—43. <https://doi.org/10.1016/j.geothermics.2015.07.008>
- Boguniewicz-Zabłocka, J.; Łukasiewicz, E.; Domenico Guida, D. (2019): Analysis of the Sustainable Use of Geothermal Waters and Future Development Possibilities—A Case Study from the Opole Region, Poland, *Sustainability*, 11. <https://doi.org/10.3390/su11236730>
- Böhm, R., Koch, R., Höferle, R., & Baasch, R. (2010). Upper Jurassic of the Pullach Th2 geothermal well—Facies analysis using cuttings (Munich, S-Germany). *Geol. Bl. NO-Bavaria*, 60, 17-49. https://www.erdwerk.com/sites/default/files/users/user14/21_2011_PullachTh2_GeoBlaetter_Boehm_DE_EN.pdf
- Bonté, D., Van Wees, J.-D., Verwij, J.M. (2012). Subsurface temperature of the onshore Netherlands: new temperature dataset and modelling. *Netherlands Journal of Geosciences*, 91-4, p. 491-516. <https://doi.org/10.1017/S0016774600000354>
- Borović, S., Marković, T., & Larva, O. (2015). Protection of transboundary aquifers of Međimurje County (Croatia): status and prospects. *International journal of environment and health*, 7(3), 197-214. <https://doi.org/10.1504/IJENVH.2015.073194>
- Bott, M. H., & Smith, F. W. (2018). The role of the Devonian Weardale Granite in the emplacement of the North Pennine mineralization. *Proceedings of the Yorkshire Geological Society*, 62 (1), 1-15. <https://doi.org/10.1144/pygs2017-391>
- Bozkurtoglu, E., Vardar, M., Suner, F., & Zambak, C. (2006). A new numerical approach to weathering and alteration in rock using a pilot area in the Tuzla geothermal area, Turkey. *Engineering Geology*, 87 (1-2), 33-47. <https://doi.org/10.1016/j.enggeo.2006.06.002>
- Breede, K., Dzebisashvili, K., Liu, X., & Falcone, G. (2013). A systematic review of enhanced (or engineered) geothermal systems: past, present and future. *Geothermal Energy*, 1, 1-27. <https://doi.org/10.1186/2195-9706-1-4>
- Brodzki, D.; Abou Akar, A.; Djega-Mariadassou, G. (1992): Catalytic hydroliquefaction of coal macerals: comparison with raw coal, Technical report, 74 p.

- Bucher, K.; Stober, I. (2016): Large-scale chemical stratification of fluids, in the crust: hydraulic and chemical data from the geothermal research site Urach, Germany, *Geofluids*, 16., 813-825. <https://doi.org/10.1111/gfl.12186>
- Budach, I., Moeck, I., Lüschen, E., & Wolfgramm, M. (2018). Temporal evolution of fault systems in the Upper Jurassic of the Central German Molasse Basin: case study Unterhaching. *International Journal of Earth Sciences*, 107, 635-653. <https://doi.org/10.1007/s00531-017-1518-1>
- Bundesanstalt für Geowissenschaften und Rohstoffe (BGR). (n.d.). *Geotis – Geoscientific Information System*. <https://www.geotis.de/> [last accessed: 12.02.2026]
- Bureau de Recherches Géologiques et Minières (BRGM). (n.d.). *InfoTerre*. <https://infoterre.brgm.fr/> [last accessed: 12.02.2026]
- Busby, J. (2014). Geothermal energy in sedimentary basins in the UK. *Hydrogeology journal*, 22(1), 129-141. <https://doi.org/10.1007/s10040-013-1054-4>
- BWG Geochemische Beratung GbR: Geochemical investigations of water and solid samples at Honselersdijk GT 1 during the hydraulic test on 07-08 March 2012, NLOG_GS_PUB_report_120412.pdf, <https://www.nlog.nl/brh-web/rest/brh/document/1227269008>
- Cailleaux, P.; Fouillac, C.; Michard, G.; Ouzounian, G. (1976): Etude géochimique des sources thermales de Chaudes Aigues, Conséquences géothermiques, C. r. hebdomadaire des séances Acad. Sci., Paris (D), 282, 1237-1240
- Caritg, S., Gal, F., Girard, J.-F., Gutierrez, A., Jacob, T., Martelet, G., Coppo, N., Rad, S., Tailame, A.-L., Traineau, H., Vittecoq, B., & Wawrzyniak, P. (2013). The Petite Anse-Diamant geothermal system (Martinique Island, Lesser Antilles): Results of the 2012–2013 exploration. *Proceedings of the World Geothermal Congress 2015*, Melbourne, Australia. <https://brgm.hal.science/hal-01102469/file/11067.pdf>
- Caritg, S.; Bouchot, V.; Calcagno, P.; Chévremont, G. F.; Innocent, C.; Négrel Ph.; Sanjuan, B. (2013): Projet PEGASE - Exploration géothermique de surface des régions de Chaudes-Aigues et de Coren (Massif central français), Étape 2 - Reconnaissance de surface préliminaire (géologie, géochimie eaux et gaz des sols). BRGM/RC-61713-FR report, p. 268.
- Chowaniec, J. (2009). Hydrogeology study of the western part of the Polish Carpathians. *Biuletyn Państwowego Instytutu Geologicznego*, 434, 1-98. <http://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-article-AGHM-0047-0028/c/1.pdf>
- Chowaniec, J. (2012). Gorąca kopalina niecki podhalańskiej na tle innych niecek przytatrzańskich. *Biuletyn Państwowego Instytutu Geologicznego*. <https://geojournals.pgi.gov.pl/bp/article/view/29112/20785>
- Chowaniec, J., Duliński, M., Mochalski, P., Najman, J., Śliwka, I., & Zuber, A. (2009). Rezultaty analiz gazów szlachetnych w wodach termalnych niecki podhalańskiej. *Przegląd Geologiczny*, 57(8), 652-652. <https://geojournals.pgi.gov.pl/pg/article/view/30378>
- Chowaniec, J., Poprawa, D., & Witek, K. (2001). Występowanie wód termalnych w polskiej części Karpat. *Przegląd Geologiczny*, 49(8), 734-742. <https://geojournals.pgi.gov.pl/pg/article/view/14991/12874>
- Christiansen, F. G.; Larsen, H. C.; Marcussen, C.; Plasecki, S.; Stemmerik, L. (1993): Late Paleozoic plays in East Greenland, *Petroleum Geology of Northwest Europe: Proceedings of the 4th Conference*, 1. 657-666. ISBN: 0-903317-85-0, <https://doi.org/10.1144/0040657>
- Ciężkowski, W., Michniewicz, M., & Przylibski, T. A. (2011). Wody termalne na Dolnym Śląsku. Mezozoik i Kenozoik Dolnego Śląska, Wyd. WIND, Wrocław, 107-120. <https://www.researchgate.net/profile/Tadeusz-Przylibski/publication/259291932>
- Cohut I., Plavita R., Sabou L., Studiu de etapa privind posibilitatile de exploatare a sistemului hidrogeotermal al Banatului de Vest la data de 1 august 1987, 1987, Oradea (incomplete reference)
- Cos, L.; Gimenez, J.; Menjoz, A.; Fabris, H.; Rojas, J.; Goyeneche, O.; Desplan, A. (1981): Forage géothermique la courneuve sud GLCS2, Rapport de fin de sondage, Service Géologique National, <https://infoterre.brgm.fr/rapports/81-SGN-386-GTH.pdf>
- Criaud, A.; Fouillac, C. (1986): Etude des eaux thermominérales carbogazeuses du Massif Central Français. II. Comportement de quelques métaux en trace, de l'arsenic, de l'antimoine et du germanium, *Geochimica et Cosmochimica Acta*, 50(8), 1573-1582. [https://doi.org/10.1016/0016-7037\(86\)90120-1](https://doi.org/10.1016/0016-7037(86)90120-1)
- Criaud, A.; Fouillac, C. (1986): Etude des eaux thermominérales carbogazeuses du Massif Central Français. I. Potentiel d'oxydo-réduction et comportement du fer, *Geochimica et Cosmochimica Acta*, 50(4), 525-533. [https://doi.org/10.1016/0016-7037\(86\)90102-X](https://doi.org/10.1016/0016-7037(86)90102-X)
- De Putter, T., Groessens, E., & Herbosch, A. (1991). Le V3a anhydritique du sondage de Saint-Ghislain (150E387), Province du Hainaut, Belgique: description macroscopique et structures sédimentaires. Professional paper-Service géologique de Belgique, (250). https://biblio.naturalsciences.be/rbins-publications/professional-papers-of-the-geological-survey-of-belgium/pdfs/pp_1991_6_250.pdf
- Delmer, A. (1977): Le bassin du Hainaut et le sondage de Saint-Ghislain. Professional Paper 1977/6, No. 143, 11.
- Delmer, A., Leclercq, V., Marlière, R., & Robaszynski, F. (1982). La géothermie en Hainaut et le sondage de Ghlin (Mons, Belgique). In *Annales de la Société géologique du Nord Lille* (Vol. 101, pp. 189-206). <https://doi.org/10.3406/asgn.1981.1460>

- Delmer, A.; Rorive, A.; Stenmans, V. (1997): Dix ans de géothermie en Hainaut, Bulletin de la Société belge de Géologie, 105(1-2), 77-85. https://biblio.naturalsciences.be/rbins-publications/bulletin-de-la-societe-belge-de-geologie/105%20-%201996/bsbg_105_1996_p077-085.pdf
- Demians d'Archimbaud, J.; Munier-Jolain, J. P. (1975): Les progres de l'exploration géothermique a Bouillante en Guadalupe, Tiré a part, 101-104
- Demians d'Archimbaud, J., & Munier-Jolain, J. P. (1975). Geothermal exploration progress at Bouillante in Guadeloupe. In Proceedings of the Second United Nations Symposium on the Development and Use of Geothermal Resources (Vol. 1, pp. 105–107). Berkeley, CA: Lawrence Berkeley Laboratory.
- Dewertz A.; Herbrich B.; Fabris H.; Maget P.; Menjoz A.; Tournaye D., (1981): GMY2 Forage géothermique de Melleray, réinjection, 76 p. <https://infoterre.brgm.fr/rapports/81-SGN-441-GTH.pdf>
- Dezayes, C., Lerouge, C., Kushnir, A., Heap, M., Baud, P., Girard, J.-F., Darnet, M., Porté, J., Chabaux, F., Ackerer, J., Genter, A., & Maurer, V. (2018). Is the basement-sediment transition zone in the Rhine Graben a good geothermal reservoir? An analogue approach in the CANTARE-Alsace project. In Proceedings of the 6th European Geothermal Workshop (EGW 2018), Strasbourg, France. <https://brgm.hal.science/hal-01870392/document>
- Dimitrova, R., & Katskov, N. (1990). Geological Map of PR Bulgaria on Scale 1: 100 000. Velingrad Map Sheet.
- Dimopoulos, G. (1987). Beiträge zur Hydrologie der Steiermark [Contributions to the hydrology of Styria]. Beiträge zur Hydrologie, 41, 133–149.
- Dotsika, E. (2012). Isotope and hydrochemical assessment of the Samothraki Island geothermal area, Greece. Journal of Volcanology and Geothermal Research, 233, 18-26. <https://doi.org/10.1016/j.jvolgeores.2012.04.017>
- Dotsika, E. (2015). H–O–C–S isotope and geochemical assessment of the geothermal area of Central Greece. Journal of Geochemical Exploration, 150, 1–15. <https://doi.org/10.1016/j.gexplo.2014.11.008>
- Dotsika, E., Leontiadis, I., Poutoukis, D., Cioni, R., & Raco, B. (2006). Fluid geochemistry of Chios geothermal area, Chios Island, Greece. Journal of Volcanology and Geothermal Research, 154(3–4), 237–251. <https://doi.org/10.1016/j.jvolgeores.2006.02.013>
- Dotsika, E., Poutoukis, D., & Raco, B. (2010). Fluid geochemistry of the Methana Peninsula and Loutraki geothermal area, Greece. Journal of Geochemical Exploration, 104(3), 97–104. <https://doi.org/10.1016/j.gexplo.2010.01.001>
- Dotsika, E., Poutoukis, D., Michelot, J. L., & Raco, B. (2009). Natural tracers for identifying the origin of the thermal fluids emerging along the Aegean volcanic arc (Greece): Evidence of arc-type magmatic water (ATMW) participation. Journal of Volcanology and Geothermal Research, 179(1–2), 19–32. <https://doi.org/10.1016/j.jvolgeores.2008.09.024>
- Dotsika, E.; Leontiadis, I.; Poutoukis, D.; Cioni, R.; Raco, B. (2006): Fluid geochemistry of the Chios geothermal area, Chios Island, Greece, Journal of Volcanology and Geothermal Research, 154(3-4), 237-250. <https://doi.org/10.1016/j.jvolgeores.2006.02.013>
- Dotsika, E.; Poutoukis, D.; Raco, B. (2010): Fluid geochemistry of the Methana Peninsula and Loutraki geothermal area, Greece, Journal of Geochemical Exploration, 104(3), 97-104. <https://doi.org/10.1016/j.gexplo.2010.01.001>
- Dotsika, E.; Tzavidopoulos, I.; Dimitros, P.; Raco, B. (2012): Isotope contents, Cl/Br ratio and origin of water at Pikrolimni Lake: A natron source in Greece, as archive of past environmental conditions, Quaternary International, 266. 74-80. <https://doi.org/10.1016/j.quaint.2011.03.033>
- Downing, R. A., & Gray, D. A. (1986). Geothermal resources of the United Kingdom. Journal of the Geological Society, 143(3), 499-507. <https://doi.org/10.1144/gsjgs.143.3.049>
- Downing, R. A., Allen, D. J., Barker, J. A., Burgess, W. G., Gray, D. A., Price, M., & Smith, I. F. (1984). Geothermal exploration at Southampton in the UK: a case study of a low enthalpy resource. Energy exploration & exploitation, 2(4), 327-342. <https://doi.org/10.1177/014459878400200404>
- Downing, R. A.; Gray, D. A. (1986): Geothermal resources of the United Kingdom, Journal of the Geological Society, 143(3) 499-507. <https://doi.org/10.1144/gsjgs.143.3.0499>
- Dupont, N.; Licour, L.; Rorive, A. (2014): GÉOTHERMIE EN HAINAUT, UMons, Service de Géologie Fondamentale et Appliquée, 98. 6-8. https://orbi.umons.ac.be/bitstream/20.500.12907/25955/1/echokarstN98_Geoth.pdf
- Duriez, A., Marlin, C., Dotsika, E., Massault, M., Noret, A., & Morel, J. L. (2008). Geochemical evidence of seawater intrusion into a coastal geothermal field of central Greece: Example of the Thermopylae system. Environmental Geology, 54(3), 551–576. <https://doi.org/10.1007/s00254-007-0857-9>
- Dürrnhaar - Geothermieranlage: <https://www.geothermie.de/bibliothek/lexikon-der-geothermie/d/duerrnhaar-geothermieranlage> [14.05.2025]
- Enerchange GmbH & Co. KG (2024): Bundesverband Geothermie. URL: <https://www.tiefengeothermie.de/projekte/aschheim-feldkirch-und-kirchheim> [last accessed: 17 Apr 2025]
- Enerchange GmbH & Co. KG (2024): Informationsportal Tiefe Geothermie. URL: <https://www.tiefengeothermie.de/projekte/muenchen-riem> [last accessed: 17 Apr 2025]

- Enerchange. (o. D.). Waren (Müritz). Informationsportal Tiefe Geothermie. Abgerufen am 30. Mai 2025, von <https://www.tiefegeothermie.de/projekte/waren-mueritz>
- Erdwerk: <https://www.erdwerk.com/de/bad-woerishofen> [11.04.2025.]
- Eyzaguire, F., M.; Castro, F., A. (2010): *Vademecum II de augas mineromedicinales espanolas*, ISBN: 978-84-7491-998-1
- Fabriol, R.; Ouzounian, G. (1985): *Prospection géothermique de la plaine du Lamentin (Martinique): Modèle hydrogéochimique*, BRGM report n° 85 SGN 384 GTH, 28 p. <https://infoterre.brgm.fr/rapports/85-SGN-384-GTH.pdf>
- Federico, C., Capasso, G., Paonita, A., & Favara, R. (2010). Effects of steam-heating processes on a stratified volcanic aquifer: Stable isotopes and dissolved gases in thermal waters of Vulcano Island (Aeolian archipelago). *Journal of volcanology and geothermal research*, 192(3-4), 178-190. <https://www.sciencedirect.com/science/article/abs/pii/S0377027310000752>
- Felter, A., Skrzypczyk, L., Socha, M., Sokołowski, J., Sosnowska, M., Stożek, J., Gryszkiewicz, I., Wrzosek, A. (2019). *Mapa zagospodarowania wód podziemnych zaliczonych do kopalin w Polsce*. Wyd. PIG, Warszawa. https://www.pgi.gov.pl/index.php?option=com_attachments&task=download&id=21312
- Ferreira, M., Oliveira, AS, & Trota, AN (2003). *Termas de Chaves: I-as bases tectónicas and litoestratigráficas for a modelação física e química do sistema hidrotermal*. https://doi.org/10.14195/978-989-26-0322-3_20
- Franzson, H. (2000): *Reykjanes High-Temperature System. A Study of Fluid Inclusions in Wells RN-9 and RN-10*. National Energy Authority of Iceland Report, OS-2000/O21, 20 p. (In Icelandic)
- Friðleifsson, G. Ó.; Elders, W. A. (2005): The Iceland Deep Drilling Project: A search for deep unconventional geothermal resources, *Geothermics*, 34(3), 269-285. <https://doi.org/10.1016/j.geothermics.2004.11.004>
- Friðleifsson, G. Ó.; Elders, W. A.; Zierenberg, R. A.; Fowler, A. P. G.; Weisenberger, T. B.; Mesfin, K.; Sigurðsson, Ó.; Nielsson, S.; Einarsson, G.; Óskarsson, F.; Guðnason, E. Á.; Tulinius, H.; Hokstad, K.; Benoit, G.; Nono, F.; Loggia, D.; Parat, F.; Cichy, S. B.; Escobedo, D.; Mainprice D. (2020): The Iceland Deep Drilling Project at Reykjanes: Drilling into the root zone of a black smoker analog, *Journal of Volcanology and Geothermal Research*, 391. <https://doi.org/10.1016/j.jvolgeores.2018.08.013>
- FRITZ, J. (1988). Geothermal energy from highly saline hot water in Bruchsal. *Water and Soil*, 40 (11), 629-635.
- Fuks, T.; Janža, M.; Šram, D.; Lapanje, A. (2013): *Report on Bad Radkersburg – Hodoš pilot area model*, Transenergy, http://transenergy-eu.geologie.ac.at/Downloads/outputs/Summary%20report%20of%20the%20supra-regional%20hydrogeological%20model/WP5/WP5_Bad%20Radkersburg-Hodos_pilot%20area_5.2.3_5.2.5_hydrogeological_and_geothermal_modeling.pdf
- Galeczka, I., Eiríksdóttir, ES, Pálsson, F., Oelkers, E., Lutz, S., Benning, LG, ... & Gislason, SR (2017). Pollution from the 2014–15 Bárðarbunga eruption monitored by snow cores from the Vatnajökull glacier, Iceland. *Journal of Volcanology and Geothermal Research*, 347, 371-396. <https://doi.org/10.1016/j.jvolgeores.2017.10.006>
- Genter, A.; Guillou-Frottier, L.; Feybesse, J-L.; Nicol, N.; Dezayes, C.; Schwartz, S. (2003) Typology of potential Hot Fractured Rock resources in Europe, *Geothermics*, 32., 701-710. [https://doi.org/10.1016/S0375-6505\(03\)00065-8](https://doi.org/10.1016/S0375-6505(03)00065-8)
- Geological Survey of Denmark and Greenland (GEUS). (n.d.). *GEUS Data Portal*. <https://data.geus.dk/> [last accessed: 12.02.2026]
- GEOLOGICZNA, P. S. (2024). *BILANS ZASOBÓW ZŁÓŚ KOPALIN W POLSCE*. Stan na, 31. <https://www.pgi.gov.pl/oferta-inst/wydawnictwa/serie-wydawnicze/bilans-zasobow-kopalin.html>
- GEOLOGICZNA, P. S. (2024). *BILANS ZASOBÓW ZŁÓŚ KOPALIN W POLSCE*. Stan na, 31. https://www.pgi.gov.pl/images/surowce/2023/bilans_2023.pdf
- GeothermPerform Project Consortium. (n.d.). *GeothermPerform*. <https://www.geothermperform.eu/> [last accessed: 12.02.2026] Kristensen L., Dideriksen K., Holmslykke H.D., Kjølner C., Larsen U., Mathiesen T., Dijkstra H., Poort J., Wasch L., Omrani P.S., Regenspurg S. *PERFORM WP1: Deliverable D1.3. Learn and Understand Knowledge database for understanding the current problems*. *PERFORM Work Package Report*. April 2020. https://www.geothermperform.eu/wp-content/uploads/2020/04/PERFORM_WP1_Report_final.pdf
- Gerling, J. P.; Tischner, T.; Kosinowski, M.; Bräuer, V. (2015): *Erdwärmegewinnung mittels Generierter geothermischer Systeme (GeneSys) – Teil 1: Testarbeiten in der Bohrung Horstberg Z1 und Abteufen der Bohrung Groß Buchholz Gt1*. *Geologisches Jahrbuch Reihe A, Band A 162*, 261. <https://www.schweizerbart.de/publications/detail/isbn/9783510968534>
- Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH. (2014). *GRS-316 Teil B: GeoSys – Systemanalyse der geothermalen Energieerzeugung. Ausführliche Ergebnisdokumentation*. Изтерлено на 30 май 2025 г. от https://www.grs.de/sites/default/files/publications/GRS-316_TeilB.pdf
- Gevrek, A. İ., & Karamanderesi, İ. H (1989). Clay mineralogy and hydrothermal alteration studies on Aydın-Germencik geothermal wells. In *Proceedings of the International Symposium of Clay* (Vol. 6, pp. 11-121).
- Gluyas, J. G.; Hichens, H. M. (2003): *United Kingdom Oil and Gas Fields Commemorative Millennium Volume*, ISBN: 9781862393950, <https://doi.org/10.1144/GSL.MEM.2003.020>
- Goldbrunner, J. (2005): *Bad Blumau (Styria, Austria) – The success story of combined use of geothermal energy*. *GHC Bulletin*, 26(2), 27-30. <https://www.osti.gov/servlets/purl/1209258>

- Goldbrunner, J. E., & Vasvari, V. (2016). Hydrogeology and geothermic simulation of the geothermal doublet at Waldkraiburg (Bavaria). *AJES*. <https://doi.org/10.17738/ajes.2016.0007>
- Górecki, W., & Hajto, M. (2011). Atlas of geothermal waters and energy resources in the Western Carpathians. AGH KSE, Kraków. <https://www.researchgate.net/publication/275028560>
- Górecki, W., Hajto, M., Strzetelski, W., & Szczepański, A. (2010). Dolnokredowy oraz dolnojurański zbiornik wód geotermalnych na Niżu Polskim. *Przegląd geologiczny*, 58(7), 589-593. <http://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-article-BUS6-0023-0017>
- Górecki, W.; Hajto, M.; Papiernik, B.; Szczepański, A.; Kuźniak, T.; Kozdra, T.; Soboń, J.; Szewczyk, J.; Strzetelski, W.; Haładus, A.; et al. (2006) Atlas of Geothermal Resources of Mesozoic Formations in the Polish Lowlands https://kse.agh.edu.pl/uploaded/AGH-Atlas_Geotermalny_Mezozoiku-2006.pdf
- Göthel, MICHAEL (2014). Use and potential of the deep subsurface in Brandenburg, Part 2: Geothermal energy development through deep geothermal systems, heat storage, and thermal brine extraction. Brandenburg. *Geosciences. Contributions*, 21 (1), 2. https://lbgr.brandenburg.de/sixcms/media.php/9/BGB-1-2_14_Goethel_4_129-138.pdf
- Grassi, S., Kolios, N., Mussi, M., & Saradeas, A. (1997). Groundwater circulation in the Nea Kessani low-temperature geothermal field (NE Greece). *Geothermics*, 25(2), 231–247. [https://doi.org/10.1016/0375-6505\(95\)00042-9](https://doi.org/10.1016/0375-6505(95)00042-9)
- Groessens, E. (1979). Le Dinantien du sondage de Saint-Ghislain. *Mémoires pour Servir à l'Explication des Cartes Géologiques et Minières de la Belgique*, 22, 1. <https://biblio.naturalsciences.be/rbins-publications/memoirs-of-the-geological-survey-of-belgium/pdfs/msgb-1979-22x.pdf>
- Gudmundsson, B. T., & Arnórsson, S. (2002). Geochemical monitoring of the Krafla and Námafjall geothermal areas, N-Iceland. *Geothermics*, 31(2), 195-243. [https://doi.org/10.1016/S0375-6505\(01\)00022-0](https://doi.org/10.1016/S0375-6505(01)00022-0)
- Gunnarsson-Robin, J., Stefánsson, A., Ono, S., & Torssander, P. (2017). Sulfur isotopes in Icelandic thermal fluids. *Journal of Volcanology and Geothermal Research*, 346, 161-179. <https://doi.org/10.1016/j.jvolgeores.2017.01.021>
- Haenel R. (1982): The Urach geothermal project (Swabian Alb, Germany), ISBN 978-3-510-65107-8
- Hajto, M. (2008). Baza zasobowa wód termalnych na Niżu Polskim-geologiczne i hydrogeologiczne uwarunkowania lokalizacji obszarów perspektywicznych. *Geologia/Akademia Górniczo-Hutnicza im. Stanisława Staszica w Krakowie*, 34, 503-526. <http://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-article-AGHM-0002-0047>
- Halliday, A. N., Shepherd, T. J., Dickin, A. P., & Chesley, J. T. (1990). Sm–Nd evidence for the age and origin of a Mississippi Valley Type ore deposit. *Nature*, 344(6261), 54-56. <https://doi.org/10.1038/344054a0>
- Hamm, V., & Maurel, C. (2019). *Projet SYBASE: Système de bancarisation et de suivi des opérations de géothermie de basse énergie en France métropolitaine (Rapport final, BRGM/RP-68601-FR)*. Bureau de Recherches Géologiques et Minières.
- Hardardóttir, V., Brown, K. L., Fridriksson, T., Hedenquist, J. W., Hannington, M. D., & Thorhallsson, S. (2009). Metals in deep liquid of the Reykjanes geothermal system, southwest Iceland: Implications for the composition of seafloor black smoker fluids. *Geology*, 37(12), 1103-1106. <https://doi.org/10.1130/G30229A.1>
- Hartmann Valves GmbH (2024): Bundesverband Geothermie. URL: <https://www.tiefegeothermie.de/projekte/geretsried> [last accessed: 17 Apr 2025]
- Hartmann Valves GmbH, Herrenknecht Vertical GmbH, Rödl & Partner (2025): Informationsportal Tiefe Geothermie. URL: <https://www.tiefegeothermie.de/projekte/kirchweidach> [last accessed: 17 Apr 2025]
- Hehn, V.; Iannotta, J. (2022): Hydrochemical analysis thermal water Gross Schoenebeck, Germany. GFZ Data Services. <https://doi.org/10.5880/GFZ.4.8.2022.010>
- Heidinger, M.; Eichinger, F.; Purtschert, R.; Mueller, P.; Zappala, J.; Wirsing, G.; Geyer, T.; Fritzer, T.; Groß, D. (2019): Altersbestimmung an thermalen Tiefenwässern im Oberjura des Molassebeckens mittels Krypton-Isotopen. *Grundwasser - Zeitschrift der Fachsektion Hydrogeologie* 24, 287–294. <https://doi.org/10.1007/s00767-019-00431-0>
- Hellenic Survey of Geology and Mineral Exploration: <https://www.eagme.gr/> [15.05.2025]
- Herrenknecht Vertical GmbH (2025): Informationsportal Tiefe Geothermie. URL: <https://www.tiefegeothermie.de/projekte/hannover> [last accessed: 17 Apr 2025]
- Hesemann, J. (1965): *Die Ergebnisse der Bohrung Münsterland 1*, ISBN : 978-3-663-06086-4, <https://doi.org/10.1007/978-3-663-06999-7>
- Hesshaus, A.; Kringel, R.; Schloemer, S. (2010): Hydrogeochemie des Fluids der Wealden-Formation am Standort der GeneSys-Geothermiebohrung Groß Buchholz GT1 GeneSys-Projekt, <https://doi.org/10.13140/RG.2.2.22093.51680>
- Hirst, C. (2017). The geothermal potential of low enthalpy deep sedimentary basins in the UK (Doctoral dissertation, Durham University). <https://core.ac.uk/download/pdf/78900721.pdf>
- Hirst, C. M.; Gluyas, J. G.; Mathias, S. A. (2014): The late field life of the East Midlands Petroleum Province; a new geothermal prospect?, *Quarterly Journal of Engineering Geology and Hydrogeology*, 48, 104-114. <https://doi.org/10.1144/qjgeh2014-072>
- Huculak, M.; Jarczewski, W.; Dej, M. (2015): Economic aspects of the use of deep geothermal heat in district heating in Poland, *Renewable and Sustainable Energy Reviews*, 49, 29-40. <https://doi.org/10.1016/j.rser.2015.04.057>

- Huenges, E., & Winter, H. (2004). Experimente zur Produktivitätssteigerung in der Geothermie-Forschungsbohrung Groß Schönebeck 3/90. <https://doi.org/10.23689/FIDGEO-584>
- Hurter, S. (2001): Logging interpretation in Gross Schönebeck: well deviation, caliper, pressure, temperature, mud resistivity; Scientific Technical Report, GeoForschungsZentrum Potsdam, 87-107
- Iannotta, J.; Hehn, V. (2022): The H2020 REFLECT project: Deliverable 2.1 – Fluid data of geothermal sites (type C), GFZ German Research Centre for Geosciences, <https://doi.org/10.48440/gfz.4.8.2021.005>
- Jarzyna, J. A., Baudzis, S., Janowski, M., & Puskarczyk, E. (2021). Geothermal resources recognition and characterization on the basis of well logging and petrophysical laboratory data, polish case studies. *Energies*, 14(4), 850. <https://doi.org/10.3390/en14040850>
- Johnson, GAL, Somerville, ID, Tucker, ME, & Cózar, P. (2011, May). Carboniferous stratigraphy and context of the Seal Sands No. 1 Borehole, Teesmouth, NE England: the deepest onshore borehole in Great Britain. Geological Society of London. <https://doi.org/10.1144/pygs.58.3.231>
- Jones, J. M., & Creaney, S. (1977). Optical character of thermally metamorphosed coals of northern England. *Journal of Microscopy*, 109(1), 105-118. <https://doi.org/10.1111/j.1365-2818.1977.tb01120.x>
- Karacık, Z., & Yılmaz, Y. (1998). Geology of the ignimbrites and the associated volcano–plutonic complex of the Ezine area, northwestern Anatolia. *Journal of Volcanology and Geothermal Research*, 85(1-4), 251-264. [https://doi.org/10.1016/S0377-0273\(98\)00058-4](https://doi.org/10.1016/S0377-0273(98)00058-4)
- Karamanderesi, İ.H., (1986). Hydrothermal alteration in well Tuzla T-2, Çanakkale, Turkey. UNU Geothermal Training Programme, Reykjavik, Iceland. Book of Reports, 3–36.
- Karydakis, G.; Arvanitis, A.; Andritsos, N.; Fytikas, M. (2005): Low enthalpy geothermal fields in the Strymin Basin (Northern Greece), *Proceedings World Geothermal Congress, Antalya, Turkey, (24-29 April 2005)*, 2615, 24-29.
- Kasztelewicz, A., & Tomaszewska, B. (2019). The quality of geothermal reservoir of the Lower Jurassic aquifer in the Mogilno-Łódź Trough (Polish Lowlands). In *E3S Web of Conferences (Vol. 133, p. 02004)*. EDP Sciences. <https://doi.org/10.1051/e3sconf/201913302004>
- Kavouridis, T.; Kuris, D.; Leonis, C.; Liberopoulou, V.; Leontiadis, J.; Panichi, C.; La Ruffa, G.; Caprai, A. (1999): Isotope and chemical studies for a geothermal assessment of the island of Nisyros (Greece), *Geothermics*, 28(2), 219-239. [https://doi.org/10.1016/S0375-6505\(99\)00005-X](https://doi.org/10.1016/S0375-6505(99)00005-X)
- Kepinska, B. (2009): ZNACZENIE BADAŃ PODHALAŃSKIEGO SYSTEMU GEOTERMALNEGO DLA EKSPLOATACJI WÓD GEOTERMALNYCH, *Technika Poszukiwan Geologicznych Geotermia, Zrównowazony Rozwój*, https://min-pan.krakow.pl/wp-content/uploads/sites/4/2017/12/TPG_2_2009_art4.pdf
- Kępińska, B.; Hajto, M.; Pétursson, B.; Einarsson, Ó., P.; Pająk, L.; Tulinius, H.; Þorgilsson, G.; Axelsson, G.; Gudmundsson, J., R.; Karska, A.; Peraj, A.; Sęczkowski, P.; Bujakowski, W.; Kasztelewicz, A.; Sowizdżał, A.; Papiernik, B.; Miecznik, M.; Tomaszewska, B.; Bielec, B. (2017): Geothermal Energy Utilisation Potential in Poland – town Poddebice, Study Visit's Report ISBN 978-9979-68-424-4, <https://gogn.orkustofnun.is/Skyrslur/OS-2017/OS-2017-03.pdf> [15.05.2025]
- Kimbell, G. S., Young, B., Millward, D., & Crowley, Q. G. (2010). The North Pennine batholith (Weardale Granite) of northern England: new data on its age and form. *Proceedings of the Yorkshire Geological Society*, 58(2), 107-128. <https://doi.org/10.1144/pygs.58.1.273>
- Kovács K., Seres A., Hartai É., Regenspurg, S., Kieling, K. (2025): The REFLECT European Geothermal Fluid Atlas dataset. GFZ Data Services. <https://doi.org/10.5880/figeo.2025.088>
- Kralj, P. (2001). The thermal water system of the Mura Basin in northeastern Slovenia. Chair of Engineering Geology and Hydrogeology, RWTH Aachen University.
- Kralj, P., & Kralj, P. (2000). Thermal and mineral waters in north-eastern Slovenia. *Environmental Geology*, 39, 488-500. <https://doi.org/10.1007/s002540050455>
- Kühn, M., Vernoux, J. F., Kellner, T., Isenbeck-Schröter, M., & Schulz, H. D. (1998). Onsite experimental simulation of brine injection into a clastic reservoir as applied to geothermal exploitation in Germany. *Applied Geochemistry*, 13(4), 477-490. [https://doi.org/10.1016/S0883-2927\(97\)00081-4](https://doi.org/10.1016/S0883-2927(97)00081-4)
- Kühn, M.; Niewöhner, C.; Isenbeck-Schröter, M.; Schultz, H. D. (1998): Determination of major and minor constituents in anoxic thermal brines of deep sandstone aquifers in Northern Germany, *Water Research*, 32(2), 265-274. [https://doi.org/10.1016/S0043-1354\(97\)00252-2](https://doi.org/10.1016/S0043-1354(97)00252-2)
- La Ruffa, G.; Panichi, C.; Kavouridis, T.; Liberopoulou, V.; Leontiadis, J.; Caprai, A. (1999): Isotope and chemical assessment of geothermal potential of Kos Island, Greece, *Geothermics*, 28(2), 205-217. [https://doi.org/10.1016/S0375-6505\(99\)00004-8](https://doi.org/10.1016/S0375-6505(99)00004-8)
- Laboratório Nacional de Energia e Geologia (LNEG). (n.d.). *LNEG Geoportal*. <https://geoportal.lneg.pt/> [last accessed: 12.02.2026]
- Laboratório Nacional de Energia e Geologia, I.P. (2020). geoPortal, Mapa de Recursos Geotermicos em Portugal Continental. URL: <https://geoportal.lneg.pt/mapa/?escala=4000000&mapa=RecursosGeotermicos#> [last accessed: 10 Apr 2025]

- Lapanje, A. (2006). Origin and chemical composition of thermal and thermomineral waters in Slovenia. *Geologija*, 49(2), 347-370. <https://doi.org/10.5474/geologija.2006.025>
- LaRuffa, G., Panichi, C., Kavouridis, T., Liberopoulou, V., Leontiadis, J., & Caprai, A. (1999). Geochemical and isotopic characterization of thermal waters from the Loutraki geothermal system, Greece. *Geothermics*, 28(2), 205–218. [https://doi.org/10.1016/S0375-6505\(99\)00005-7](https://doi.org/10.1016/S0375-6505(99)00005-7)
- Leclercq, V. (1980). Le sondage de Douvrain (p. 64). Belgian Geological Service. https://biblio.naturalsciences.be/rbins-publications/professional-papers-of-the-geological-survey-of-belgium/pdfs/pp_1980_03_le-sondage-de-douvrain_leclercq.pdf
- Lenzi, A.; Caprai, A.; D'Ulivo, A.; Onor, M.; Mascherpa, M. C.; Paci, M.; Bettini, A. (2017): Sampling and analysis of Hg in geothermal fluids using vacuum sampling systems IGG-ICCOM/CNR-2 METHOD (M2), Istituto di Geoscienze e Georisorse, <https://doi.org/10.13140/RG.2.2.19560.57607>
- Liber-Makowska, E., & ŁukacZyński, I. (2016). Characteristics nowo rozpoznanego złoza wód termalnych w Karpnikach na tle warunków geotermicznych Kotliny Jeleniogórskiej. *Technika Poszukiwań Geologicznych*, 55 . https://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-65c5a1ae-e049-4884-a2d2-1b43cee35250/c/tpg_2016_2_liber-makowska_charakterystyka.pdf oder <https://min-pan.krakow.pl/wydawnictwo/wp-content/uploads/sites/4/2017/12/01-liber-makowska.pdf>
- Licour, L. (2014): The geothermal reservoir of Hainaut: the result of thermal convection in a carbonate and sulfate aquifer, *Geologica Belgica*, 17(1), 75-81. <https://popups.uliege.be/1374-8505/index.php?id=4411&file=1&pid=4401>
- Licour, L.; Abbate, T.; Rorive, A. (2009): Artesian flow and pressure recovery test on the Ghlin geothermal well (Hainaut - Belgium) - Results, interpretations and prospects for a future exploitation [Poster presentation]. *Geologica Belgica*, Ghent, Ghent, Belgium.
- Lie, S. F.; Laga, P.; Dirven, P. (1988): Geothermal demonstration project Merksplas II – Internal Report, 243.
- Maden Tetkik ve Arama Genel Müdürlüğü (Turkey), & Erişen, B. (1996). Türkiye jeotermal envanteri. Maden Tetkik ve Arama Genel Müdürlüğü;
- Magnusdottir L.; Jonsson, M. T. (2018): Geothermal Well Casings Used as Electrodes in a Resistivity Study at Reykjanes Reservoir in Iceland, *Proceedings*, 2(8), 475. <https://doi.org/10.3390/ICEM18-05383>
- Mandl, J. (1990): Wasseranalysen aus Tiefbohrungen in Nord- und Nordwestdeutschland 1926 bis 1989. – 156 (2), NLFb, Arch.-Nr. 107376; Hannover
- Manning, D. (2020). MERI Seminar – Deep heat in Newcastle: The Helix well and the search for geothermal energy in an urban setting. The University of Manchester. <https://events.manchester.ac.uk/event/event:dx6-kebewaqq-jth6rp/meri-seminar-deep-heat-in-newcastle-the-helix-well-and-the-search-for-geothermal-energy-in-an-urban-setting> [last accessed: 28 Apr 2025]
- Manning, D. A. C., Younger, P. L., Smith, F. W., Jones, J. M., Dufton, D. J., & Diskin, S. (2007). A deep geothermal exploration well at Eastgate, Weardale, UK: a novel exploration concept for low-enthalpy resources. *Journal of the Geological Society*, 164(2), 371-382. <https://doi.org/10.1144/0016-76492006-015>
- Marieni, C., Stefansson, A., Gudbrandsson, S., Gunnarsson, I., Aradottir, E. S., Gunnarsson Robin, J., & Ono, S. (2015, December). Hydrogen Sulfide Sequestration and Storage in Geothermal System: New Mitigation Strategy to Reduce H₂S from the Atmosphere and Detect its Mineralization with Multiple Sulfur Isotopic Systematics. In *AGU Fall Meeting Abstracts* (Vol. 2015, pp. H23A-1556). <https://ui.adsabs.harvard.edu/abs/2015AGUFM.H23A1556M/abstract>
- Marinova R. 1991. Geological map of Bulgaria, M 1:100 000, Map sheet Blagoevgrad K-34-071, *Geology and Geophysics* AD, Sofia
- Mercier-Batard, F. (1985) Les gaz thermaux associés aux eaux minérales d'Allevard (Isère). Note technique Brgm NT 85 RHA 041
- Michard, A.; Avigad, D.; Goffé, B.; Chopin, Ch. (2004): The high-pressure metamorphic front of the south Western Alps (Ubaye-Maira transect, France, Italy), *Schweizerische Mineralogische und Petrographische Mitteilungen* 84, 215–235. <https://www.researchgate.net/profile/Andre-Michard/publication/228768127>
- Michard, G.; Stettler, A.; Fouillac, C.; Ouzounian, G., Mandeville, D. (1976): Subsuperficial changes in chemical composition of the thermomineral waters of Vichy basin. *Geothermal implications*, *Geochemical Journal*, 10(3), 155-161. <https://doi.org/10.2343/geochemj.10.155>
- Michelot, J., Dotsika, E., & Fytikas, M. (1993). Environmental isotopes study of geothermal systems in the Aegean arc (Greece). *Geothermics*, 22(2), 91–99. [https://doi.org/10.1016/0375-6505\(93\)90033-5](https://doi.org/10.1016/0375-6505(93)90033-5)
- Miecznik, M. (2017). Model zrównoważonej eksploatacji zbiornika wód geotermalnych w centralnej części Podhala do produkcji energii cieplnej i elektrycznej . Wydawnictwo Instytutu Gospodarki Surowcami Mineralnymi i Energią PAN. <https://min-pan.krakow.pl/wydawnictwo/wp-content/uploads/sites/4/2018/01/SRM-202-Miecznik.pdf>
- Millot, R.; Scaillet, B.; Sanjuan, B. (2010): Lithium isotopes in island arc geothermal systems: Guadeloupe, Martinique (French West Indies) and experimental approach, *Geochimica et Cosmochimica Acta*, 74(6), 1852-1871. <https://doi.org/10.1016/j.gca.2009.12.007>

- Millot, R.; Vigier, N.; Gaillardet, J. (2010): Behaviour of lithium and its isotopes during weathering in the Mackenzie Basin, Canada, *Geochemica et Cosmochimica Acta*, 74(14), 3897-3912., <https://doi.org/10.1016/j.gca.2010.04.025>
- Milovanov, P., Petrov, I., Valev, V., Marinova, A., Klimov, I., Sinnyovsky, D., ... & Ilieva, E. (2009). Geological Map of Bulgaria in Scale 1: 50 000. Map Sheets K-34-82-B (Delchevo) and K-34-83-A (Simitli).
- Minissale, A., Duchi, V., Kolios, N., & Totaro, G. (1989). Geochemical characteristics of Greek thermal springs. *Journal of Volcanology and Geothermal Research*, 39(1), 1–16. [https://doi.org/10.1016/0377-0273\(89\)90017-6](https://doi.org/10.1016/0377-0273(89)90017-6)
- Morard, Alain (2025): Strati.ch. URL: <https://www.strati.ch/de/stratigraphic/froidefontaine-gruppe/cyrenen-mergel-jura> [last accessed: 17 Apr 2025]
- Mraz, E., Wolfgramm, M., Moeck, I., & Thuro, K. (2019). Detailed fluid inclusion and stable isotope analysis on deep carbonates from the North Alpine Foreland Basin to constrain paleofluid evolution. *Geofluids*, 2019 (1), 8980794. <https://doi.org/10.1155/2019/8980794>
- MUNIER-JOLAIN, J. P. (1976). Les Progrès de l'Exploration Géothermique à Bouillante en Guadeloupe. In Proceedings: Second United Nations Symposium on the Development and Use of Geothermal Resources, San Francisco, California, USA, 20-29 May 1975 (Vol. 1, p. 101). US Energy Research and Development Administration. <http://pascal-francis.inist.fr/vibad/index.php?action=getRecordDetail&idt=PASCALGEODEBRGM7720385652>
- Mutonga, M. W. (2007). The Distribution of Fluoride Ions in the Groundwaters of the Baringo Bogoria Lake Basin (Doctoral dissertation, University of Nairobi). <http://erepository.uonbi.ac.ke/handle/11295/163797>
- Mutonga, M. W., Sveinbjornsdottir, A., Gislason, G., & Amannsson, H. (2010, April). The isotopic and chemical characteristics of geothermal fluids in Hengill Area, SW-Iceland (Hellisheidi, Hveragerdi and Nesjavellir Fields). In Proceedings of the World Geothermal Congress, Bali, Indonesia (pp. 1-13). <https://www.academia.edu/download/81017624/UNU-GTP-2007-15.pdf>
- Noga, B., Biernat, H., Kapuściński, J., & Martyka, P. (2013). Analiza parametrów otworów geotermalnych wykonanych na Niżu Polskim pod kątem możliwości budowy siłowni binarnych wykorzystujących ciepło wnętrza Ziemi. *Technika Poszukiwań Geologicznych*, 52(2), 127-139. https://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-1595f4a6-0658-4777-bcef-2962be56b0f7/c/noga-i-in._analiza.pdf
- Noga, B.; Biernat, H.; Kapuscinski, J.; Martyka, P.; Nowak, K.; Grzegorz Pijewski, G. (2013): PERSPEKTYWY ZWIĘKSZENIA POZYSKIWANIA CIEPŁA GEOTERMALNEGO W ŚWIETLE NOWYCH INWESTYCJI ZREALIZOWANYCH NA TERENIE NIZU POLSKIEGO, *Technika Poszukiwań Geologicznych Geotermia, Zrównowazony Rozwój*, <https://min-pan.krakow.pl/wydawnictwo/wp-content/uploads/sites/4/2017/12/06-II-27-Noga-i-in.pdf>
- Noga, M., Biernat, H., & Kulik, M. (2017). Ocena możliwości wykorzystania wód termalnych z utworów jury dolnej w rejonie Gostynina [Assessment of the possibility of using thermal waters from Lower Jurassic formations in the Gostynin region]. In: W. Bujakowski (Ed.), *Geotermia i Środowisko* (pp. 27–36). Kraków: Instytut Gospodarki Surowcami Mineralnymi i Energią PAN. Retrieved from <https://min-pan.krakow.pl/wydawnictwo/wp-content/uploads/sites/4/2017/12/06-II-27-Noga-i-in.pdf>
- Ólafsson, J.; Riley, J. P. (1978): Geochemical studies on the thermal brine from Reykjanes (Iceland), *Chemical Geology*, 21(3-4), 219-237. [https://doi.org/10.1016/0009-2541\(78\)90046-3](https://doi.org/10.1016/0009-2541(78)90046-3)
- Operacz, A.; Bielec, B.; Tomaszewska, B.; Kaczmarczyk, M. (2020): Physicochemical Composition Variability and Hydraulic Conditions in a Geothermal Borehole—The Latest Study in Podhale Basin, Poland, *Energies*, 13(5), 3882, <https://doi.org/10.3390/en13153882>
- Operacz, A.; Chowaniec, J. (2018): Perspectives of geothermal water use in the Podhale Basin according to geothermal step distribution, *Geology, Geophysics and Environment*, 44(4). 379 <https://doi.org/10.7494/geol.2018.44.4.379>
- PanTerra Geoconsultants BV: Analysis Report, Water/Gas Samples, CAL-GT-0 1 - Grubbenvorst, Californie Wijnen, NLOG_GS_PUB_CWG CAL 01 Panterra report CAL GT01 - rev1- Aug20-1.pdf, <https://www.nlog.nl/brh-web/rest/brh/document/1471480115>
- PanTerra Geoconsultants BV: Analysis Report, Water/Gas Samples, HAG-GT1 Well, NLOG_GS_PUB_Panterra - Hag-GT1 Water-Gas Analysis Report.PDF, <https://www.nlog.nl/brh-web/rest/brh/document/975426089>
- Pasquali, R., O'neill, N., Reay, D., & Waugh, T. (2010, April). The geothermal potential of Northern Ireland. In Proceedings World Geothermal Congress (pp. 25-30).
- Pastrik, N.; Förster, A.; (2017): GEOTHERM Project. Experiences gained from German geothermal plants. A synopsis. GFZ, Potsdam. https://gfzpublic.gfz-potsdam.de/rest/items/item_8482_3/component/file_10082/content
- Pauwels, H., Gaus, I., Le Nindre, Y. M., Pearce, J., & Czernichowski-Lauriol, I. (2007). Chemistry of fluids from a natural analogue for a geological CO₂ storage site (Montmiral, France): Lessons for CO₂–water–rock interaction assessment and monitoring. *Applied geochemistry*, 22(12), 2817-2833. <https://doi.org/10.1016/j.apgeochem.2007.06.020>
- Pauwels, H.; Fouillac, C.; Fouillac, A. M. (1993): Chemistry and isotopes of deep geothermal saline fluids in the Upper Rhine Graben: Origin of compounds and water-rock interactions, *Geochemica et Cosmochimica Acta*, 57(12), 2737-2749. [https://doi.org/10.1016/0016-7037\(93\)90387-C](https://doi.org/10.1016/0016-7037(93)90387-C)

- Pauwels, H.; Lambert, M.; Genter, A. (1991): Valorisation des fluides géothermaux contenant du lithium en vue d'une production industrielle, Recherche co-financée par la Commission des Communautés Européennes, Rapport BRGM.R 33547 (1991), p. 173.
- Petit, J.-M.; Kavelaars, J. J.; Gladman, B. J.; Jones, R.L.; Parker, J. Wm.; Van Laerhoven, C.; Nicholson, P.; Mars, G.; Rousselot, P.; Mousis, O. (2011): The Canade-France ecliptic plane survey-Full data release: the orbital structure of the Kupier belt, *The Astronomical Journal*, 142, 131. <https://doi.org/10.1088/0004-6256/142/4/131>
- Petitclerc, E.; Welkenhuysen, K.; Van Passel, S.; Piessens, K.; Maes D.; Compennolle, T.; Bos, S.; Laenen, B. (2017): Development of the first deep geothermal doublet in the Campine Basin of Belgium. *European Geologist* 43, 16-20. https://issuu.com/efgoffice/docs/egj43_print
- Petrov, P., Martinov, S., Limonadov, K., & Straka, Y. (1970). Hydrogeological investigations of mineral waters in Bulgaria. PH Technika, 196 .
- Pirela, R., Mulet, J. (2015): PVT Water Analysis Draft Report, Well BRI-GT-01, Aardwarmte Vierpolders, September 1st, 2015, Water and gas analysis Report BRI-GT-01.pdf, <https://www.nlog.nl/brh-web/rest/brh/document/2030382738>
- Pirela, R., Mulet, J. (2015): PVT Water and Scale Analysis Report, Well BRI-GT-02, Aardwarmte Vierpolders, October 22, 2015, Water and gas analysis Report BRI-GT-02.pdf, <https://www.nlog.nl/brh-web/rest/brh/document/2030382757>
- Porowski, A., & Kaczor-Kurzawa, D. (2016). Pierwiastki ziem rzadkich (REE) w wodach termalnych: występowanie, pochodzenie, znaczenie i perspektywy badań w Polsce. *Technika Poszukiwań Geologicznych*, 55(1), 89-102. <https://min-pan.krakow.pl/wp-content/uploads/sites/4/2018/05/art-porowski-kaczor-poprawiony2.pdf>
- Powell, J., Schofield, D., Haslam, R., Pharaoh, T., Crane, E., Bloomfield, J. P., ... & McEvoy, F. (2018). National geological screening: Eastern England region. <https://nora.nerc.ac.uk/id/eprint/525527/1/CR17092N.pdf>
- Prévôt, M., & Chevalier, J. (1981). Les eaux thermales de la région de Vichy: Étude géochimique et isotopique. *Bulletin de la Société Géologique de France*, 23(2), 179–190. <https://doi.org/10.2113/gssgfbull.23.2.179>
- Prévôt, R., & Chevalier, J.-L. (1981). Les eaux thermales de la région de Bagnères-de-Bigorre (Hautes-Pyrénées) : étude hydrogéologique et géochimique. *Bulletin de la Société Géologique de France, Série 7*, 23(3), 345–354.
- Price, M., & Allen, D. J. (1984). THE USE OF PUMPING TESTS TO EVALUATE A GEOTHERMAL RESERVOIR-THE TRIA-SSIC SANDSTONES AT MARCHWOOD, SOUTHAMPTON. *Proceedings of the Institution of Civil Engineers*, 76(3), 697-711. <https://doi.org/10.1680/iicep.1984.1206>
- Przylibski, T. A., Żak, S., Kowalska, A., & Domin, E. (2018). Skład gazów rozpuszczonych w wodzie termalnej eksploatowanej odwiertem KT-1 w Karpnikach na obszarze granitu karkonoskiego w Sudetach. *Przegląd Geologiczny*, 66(8), 483-494. <https://doi.org/10.7306/2018.2>
- Raco, B., Dotsika, E., Battaglini, R., Bulleri, E. (2013): A Quick and Reliable Method to Detect and Quantify Contamination from MSW Landfills: a Case Study, *Water Air and Soil Pollution*, 224(3). <https://doi.org/10.1007/s11270-012-1380-5>
- Raco, B., Dotsika, E., Battaglini, R., Bulleri, E., Doveri, M., & Papakostantinou, K. (2013). Geochemical and isotopic characterization of thermal waters from the Loutraki geothermal system, Greece. *Water, Air, & Soil Pollution*, 224(1381). <https://doi.org/10.1007/s11270-013-1381-3>
- Raine, R., & Reay, D. M. (2019). A review of geothermal reservoir properties of Triassic, Permian and Carboniferous sandstones in Northern Ireland. <https://nora.nerc.ac.uk/id/eprint/527287>
- Regensburg, S., Feldbusch, E., Norden, B., & Tichomirowa, M. (2016). Fluid-rock interactions in a geothermal Rotliegend/Permo-Carboniferous reservoir (north German Basin). *Applied Geochemistry*, 69, 12-27. <https://doi.org/10.1016/j.apgeochem.2016.03.010>
- Remoroza, A. I. (2010). Calcite mineral scaling potentials of high-temperature geothermal wells. Unpublished MSc Thesis). University of Iceland, Reykjavik, 96. <https://www.academia.edu/download/82000329/Alvin-Remoroza.pdf>
- Republic of Bulgaria, Ministry of Health. (2014). Балнеологична оценка на КЕИ № 7 Сярна баня – Велинград [Balneological Assessment of KEI No. 7 Sulfur Bath – Velingrad]. Entry No. 22, dated September 26, 2014. <http://voda.velingrad.bg/images/files/Балнеологична-оценка-на-КЕИ-№-7-Сярна-баня.pdf>
- Richards, H. G.; Savage, D.; Andrewst, J. N. (1992): Granite-water reactions in an experimental Hot Dry Rock geothermal reservoir, Rosemanowes test site, Cornwall, U.K., *Applied Geochemistry*, 7, 193-222. [https://doi.org/10.1016/0883-2927\(92\)90038-5](https://doi.org/10.1016/0883-2927(92)90038-5)
- Richards, H., Savage, D., & Shepherd, Z. (1989). Geochemical forecast for a commercial-depth HDR system in SW England. *Geochemistry in Relation to Hot Dry Rock Geothermal Development in Cornwall*, Vol. 7, Research Rept. Brit. Geol. Surv. Rept. SD/89/2.
- Rockel, W., & Poppei, J. (1999). Methodische Aspekte der Speicherbewertung bei der Prognose, Erkundung und Errichtung Geothermischer Heizwerke. In *Geothermisches Heizwerk Neustadt-Glewe: Zustands-und Stoffparameter, Prozeßmodellierungen, Betriebserfahrungen und Emissionsbilanzen* (pp. 117-160). Geoforschungszentrum. <http://bib.gfz-potsdam.de/pub/str9904/9904-9.pdf>
- Rockel, W.; Poppei, J. (1999): Methodische Aspekte der Speicherbewertung bei der Prognose, Erkundung und Errichtung Geothermischer Heizwerke, *Geothermie Report 99-1.*, <https://bib.gfz-potsdam.de/pub/str9904/9904-9.pdf>

- Rojas J.; Giot D.; Criaud A.; Fouillac C.; Brach M.; Menjot A.; Martin J.-C.; Lambert M. (1989): Caractérisation et modélisation du réservoir géothermique du Dogger du Bassin Parisien, France, Rapport BRGM R 30169, 257. <https://infoterre.brgm.fr/rapports/RR-30169-FR.pdf>
- Sammam, E., O'Shea, S., Innes, G., Kemenyfy, J. G., & Piscevic, D. (2012, March). Successful controlled pressure drilling application in a geothermal field. In SPE/IADC Managed Pressure Drilling and Underbalanced Operations Conference and Exhibition (pp. SPE-156895). SPE. <https://doi.org/10.2118/156895-MS>
- Sanjuan, B. (2013): Géothermie : estimation des ressources mondiales, in book: L'énergie à découvert (pp.188-189), <https://doi.org/10.4000/books.editions-cnrs.11088>
- Sanjuan, B., Brach, M., & Lasne, E. (2001). Bouillante geothermal field: Mixing and water/rock interaction processes at 250 °C. In Proceedings of the 10th International Symposium on Water-Rock Interaction (WRI-10) (pp. 911–914). Villasimius, Italy. <https://brgm.hal.science/hal-00772706/>
- Sanjuan, B., Genter, A., Correia, H., Roig, J. Y., Brach, M., Girard, J.-P., Traineau, H., Negrel, G., Boy, E., Cotiche, C., Chouet, P., Bureau de Recherches Géologiques et Minières - BRGM, Centre scientifique et technique, 3, avenue Claude-Guillemain, BP 36009, 45060 Orleans Cedex 2 (France), & Bureau de Recherches Géologiques et Minières - BRGM, Service géologique régional Martinique, Villa Bel Azur, 4 Lot. Miramar, Route Pointe des Negres, 97200 Fort-de-France (France). (2001). Progress status of scientific works coming with well drilling for the geothermal exploration in the Lamentin plain (Martinique) - BRGM-ADEME conventions n. 99.05.026. Scientific works associated with the realisation of three geothermal exploration wells in the Lamentin plain (Martinique) - BRGM-ADEME convention n. 99.05.026, Final report. Prior assessment of the Lamentin geothermal resource, Martinique - Intermediate report. Technical-economic study of a measurement and test programme on the California geothermal exploration well in the Lamentin, Martinique - Intermediate report. <https://inis.iaea.org/records/mcmj1-ysn51>
- Sanjuan, B., Le Nindre, Y.-M., Menjot, A., Sbai, A., Brach, M., Lasne, E., Genter, A., Roig, J.-Y., Patrier, P., Beaufort, D., Bes de Berc, S., Foucher, J.-C., Lachassagne, P., Marechal, J. C., Azaroual, M., Serra, H., Jousset, P., Debeglia, N., Dupont, F., ... Agence de l'environnement et de la maitrise de l'énergie - Ademe, 20 avenue du Gresille, 49000 Angers (France). (2004). Research works related to the development of the Bouillante geothermal field (Guadeloupe) - Final report. Works of geological survey and gas exploration in soils applied to the geothermal exploration of Bouillante area, in Guadeloupe - Final report. Synthesis of deep and sub-surface hydrogeological knowledge of the Bouillante geothermal field - Conceptual model, Implications for the exploitation of the geothermal resource - Final report. Coupled chemistry-transport modelling of the Bouillante (Guadeloupe) geothermal fluid cooling - Final report. Large bandwidth seismology: methodology and applications, contribution in high-enthalpy geothermal in Bouillante (Guadeloupe) August 2004-September 2006 - Final report. Gravimetric survey of the Bouillante geothermal reservoir (Guadeloupe) Years 2006-2007 - Final report. <https://inis.iaea.org/records/jzrz-swq04>
- Sanjuan, B., Michard, A., & Michard, G. (1988). Influence of the temperature of CO₂-rich springs on their aluminium and rare-earth element contents. *Chemical Geology*, 68(1-2), 57-67. [https://doi.org/10.1016/0009-2541\(88\)90086-1](https://doi.org/10.1016/0009-2541(88)90086-1)
- Sanjuan, B., Millot, R., Asmundsson, R., Brach, M. I. C. H. E. L., & Giroud, N. (2014). Use of two new Na/Li geothermometric relationships for geothermal fluids in volcanic environments. *Chemical Geology*, 389, 60-81. <https://doi.org/10.1016/j.chemgeo.2014.09.011> OR Sanjuan, B., Millot, R., & Michel, B. (2014, June). Bouillante and Soufrière areas (Guadeloupe, French West Indies): two hydrothermal systems with different geochemical signatures. In Goldschmidt Conference 2014 (p. 30). <https://hal.science/hal-00944424/>
- Sanjuan, B., Millot, R., Ásmundsson, R., Brach, M., & Giroud, N. (2014). Use of two new Na/Li geothermometric relationships for geothermal fluids in volcanic environments. *Chemical Geology*, 389, 60–81. <https://doi.org/10.1016/j.chemgeo.2014.09.011>
- Sanjuan, B., Millot, R., Dezayes, C., & Brach, M. (2016). Major geochemical characteristics of geothermal brines from the Upper Rhine Graben granitic basement with constraints on temperature and circulation. *Chemical Geology*, 428, 27–47. <https://doi.org/10.1016/j.chemgeo.2016.02.021>
- Sanjuan, B., Peter-Borie, M., Stephan-Perrey, J., Quentin, A., & Loiselet, C. (2021). BD GTH DOM project: Towards an information platform on the high temperature geothermal exploitation in volcanic context in Overseas islands-Final report.
- Sanjuan, B., Pinault, J.-L., Rose, P. E., Gérard, A., Brach, M., Braibant, G., Crouzet, C., Foucher, J.-C., Gautier, A., & Touzelet, S. (2006). Tracer testing of the geothermal heat exchanger at Soultz-sous-Forêts (France) between 2000 and 2005. *Geothermics*, 35(5–6), 622–653. <https://doi.org/10.1016/j.geothermics.2006.09.007>
- Sanjuan, B., Rose, P., Gérard, A., Brach, M., Braibant, G., Crouzet, C., Foucher, J.-C., Gautier, A., & Touzelet, S. (2004). Tracer testing at Soultz-sous-Forêts (France) using Na-benzoate, 1,5- and 2,7-naphthalene disulfonate. In Proceedings of the 29th Workshop on Geothermal Reservoir Engineering (8 pages). Stanford University, Stanford, California. <https://brgm.hal.science/hal-00768760>
- Sanjuan, B., Traineau, H., Genter, A., Correia, H., Brach, M., & al., et. (2002). Geochemical investigations during a new geothermal exploration phase in the Lamentin Plain (Martinique, French West Indies). In Proceedings of the Twenty-Seventh Workshop on Geothermal Reservoir Engineering (pp. 1–8). Stanford University. <https://hal.archives-ouvertes.fr/hal-00768758>

- Sanjuan, B., Traineau, H., Genter, A., Correia, H., Brach, M., & Degouy, M. (2002, January). Geochemical investigations during a new geothermal exploration phase in the Lamentin Plain (Martinique, French West Indies). In Twenty-Seventh Workshop on Geothermal Reservoir Engineering (pp. 8-pages). <https://brgm.hal.science/hal-00768759>
- Sanjuan, B.; Brach, M.; Lasne, E. (2001) Bouillante geothermal field: mixing and water/rock interaction processes at 250°C.. Water Rock Interaction, WRI-10, International Symposium on Water Rock Interaction, Jun 2001, Villasimius, Italy. 911-914. <https://brgm.hal.science/hal-00772706/document>
- Sanjuan, B.; Gaucher, E. (1999): Vers la compréhension de la composition géochimique du Callovo-Oxfordien : Approches de modélisation chimique et de mesures in situ (exemples de Mol et du Mont Terri), In book: Etude pour la faisabilité des stockages de déchets radioactifs - Actes des journées scientifiques ANDRA (pp.177-202) Chapter: 32
- Sanjuan, B.; Girard, J-P.; Lanini, S.; Bourguignon, A.; Brosse, É. (2002): Geochemical modelling of diagenetic illite and quartz cement formation in Brent sandstone reservoirs: Example of the Hild Field, Norwegian North Sea, International Association of Sedimentologists Special Publications, 34., 425-452. <https://doi.org/10.1002/9781444304336.ch19>
- Sanjuan, B.; Michard, G.; Michard, A. (1988): Influence of the temperature of CO₂-rich springs on their aluminum and rare-earth elements contents. *Chemical Geology*. 68. 57-67. [https://doi.org/10.1016/0009-2541\(88\)90086-1](https://doi.org/10.1016/0009-2541(88)90086-1)
- Sanjuan, B.; Millot, R., Ásmundsson, R., Brach, M., Giroud, N. (2014): Use of two new Na/Li geothermometric relationships for geothermal fluids in volcanic environments, *Chemical Geology*, 389, 60-81. <https://doi.org/10.1016/j.chemgeo.2014.09.011>
- Sanjuan, B.; Millot, R.; Brach M.; Foucher J.-C.; Roig, J.-Y.; Baltassat, J.-M. (2005): Geothermal exploration in the Mount Pelée volcano-Morne Rouge and Diamant areas (Martinique, West French Indies) : Geochemical data, Conference: World Geothermal Congress 2005 Antalya, Turkey, (WGC 2005), 24-29/04/2005. <https://www.researchgate.net/publication/234025603>
- Sanjuan, B.; Millot, R.; Dezayes, C.; Brach, M. (2008): Fluid origin and circulation in the heat exchanger of Soultz-sous-Forêts (France) estimated using geochemical and tracer test data, EHDRA Scientific Conference, Sep 2008, Soultz-sous-Forêts, France. 6 p. <https://brgm.hal.science/hal-00773163>
- Sanjuan, B.; Millot, R.; Innocent, C.; Dezayes, C.; Scheiber, J.; Brach, M. (2016): Major geochemical characteristics of geothermal brines from the Upper Rhine Graben granitic basement with constraints on temperature and circulation, *Chemical Geology*, 428, 27-47. <https://doi.org/10.1016/j.chemgeo.2016.02.021>
- Sanjuan, B.; Pinault, J.-L.; Rose, P.; Gérard, A.; Brach, M.; Braibant, G.; Crouzet, C.; Fourcher, J.-C.; Gautier, A.; Touzelet, S. (2006): Tracer testing of the geothermal heat exchanger at Soultz-sous-Forêts (France) between 2000 and 2005, *Geothermics*, 35(5-6). 622-653., <https://doi.org/10.1016/j.geothermics.2006.09.007>
- Sanjuan, B.; Rose, P.; Foucher, J.-C.; Brach, M.; Braibant, G. (2004): Tracer testing at Soultz-sous-Forêts (France) using Nabenzoate, 1,5 and 2,7-naphthalene disulfonate, Twenty-Ninth Workshop on Geothermal Reservoir Engineering, Stanford University, Jan 2004, Stanford, United States. 8 p., 2004. <https://brgm.hal.science/hal-00768760>
- Sanjuan, B.; Rose, P.; Gerard, A.; Brach, M.; Braibant, G.; Foucher, J.-C.; Gautier, A.; Touzelet, S. (2005) Tracer testing using naphthalene disulfonate compounds during the stimulation operations carried out in the wells GPK-2, GPK-3 and GPK-4 between 2003 and 2004 at Soultz-sous-Forêts (France), <https://www.researchgate.net/publication/281074111>
- Sanjuan, B.; Rose, P.; Gerard, A.; Brach, M.; Braibant, G.; Foucher, J.-C.; Gautier, A.; Touzelet, S. (2005): Tracer testing using naphthalene disulfonate compounds during the stimulation operations carried out in the wells GPK-2, GPK-3 and GPK-4 between 2003 and 2004 at Soultz-sous-Forêts (France), EHDRA Scientific Conference, 2005, Soultz-sous-Forêts, France. 13 p., 2005, <https://brgm.hal.science/hal-00773144>
- Sanjuan, B.; Rose, P.; Gerard, A.; Crouzet, C.; Touzelet, S.; Gautier, A.; Charlot, A. (2007): Geochemical monitoring at Soultz-sous-Forêts (France) between October 2006 and March 2007, after the chemical stimulations (RMA, NTA and OCA) carried out in the wells GPK-4 and GPK-3. <https://brgm.hal.science/hal-00773155>
- Sanjuan, B.; Traineau, H.; Genter, A.; Correia, H.; Brach, M.; Degouy, M. (2002): Geochemical investigations during a new geothermal exploration phase in the Lamentin Plain (Martinique, French West Indies), Conference: 27th Workshop on Geothermal Reservoir Engineering, SGP-TR-171, 198-205. <https://www.researchgate.net/publication/234026018>
- Schäfer, F., Hesshaus, A., Hunze, S., Jatho, R., Luppold, FW, Orilski, J., ... & Wonik, T. (2012). Brief profile of the Groß Buchholz Gt 1 geothermal well. *Crude Oil, Natural Gas, Coal*, 128 (1), 20-26. <https://www.researchgate.net/publication/258769728>
- Schäffer, R.; Bär, K.; Fischer, S.; Fritsche, J.-G.; Sass, I. (2021): Database of Mineral, Thermal and Deep Groundwaters of Hesse, Germany, <https://doi.org/10.25534/tudatalib-340>
- Schintgen, T. (2015): Exploration for deep geothermal reservoirs in Luxembourg and the surroundings - perspectives of geothermal energy use, *Geothermal Energy*, 3, 9., <https://doi.org/10.1186/s40517-015-0028-2>
- Schintgen, T., Förster, A., Förster, H. J., & Norden, B. (2015). Surface heat flow and lithosphere thermal structure of the Rhenohercynian Zone in the greater Luxembourg region. *Geothermics*, 56, 93-109. <https://doi.org/10.1016/j.geothermics.2015.03.007>

- Schintgen, T.; Förster, A. (2013): Geology and basin structure of the Trier-Luxembourg Basin - Implications for the existence of a buried Rotliegend graben, *Zeitschrift der Deutschen Gesellschaft für Geowissenschaften*, 164(4), 615-637.
<https://doi.org/10.1127/1860-1804/2013/0025>
- Schmid, Ch. J. (2012) Welltest Honselersdijk GT 1, Documentation of Welltest Analysis, Technical report, NLOG_GS_PUB_HON-GT-01-01ST welltest report engl. V0a.pdf, <https://www.nlog.nl/brh-web/rest/brh/document/1227269009>
- Schmid, Ch. J. (2012): Welltest Honselersdijk GT 1, Documentation of Welltest Analysis, Technical report, NLOG_GS_PUB_HON-GT-02 welltest report engl. V4.pdf, <https://www.nlog.nl/brh-web/rest/brh/document/1228490335>
- Šimunić, A. (2008): Geotermalne i Mineralne Vode Republike Hrvatske; Hrvatski Geološki Institut: Zagreb, Croatia, ISBN 978-953-6907-14.
- Smedley, PL, Bromley, AV, Shepherd, TJ, Edmunds, WM, & Kay, RLF (1989). Geochemistry in relation to hot dry rock development in Cornwall. Volume 4, Fluid Circulation in the Carnmenellis Granite: Hydrogeological, Hydrogeochemical and Palaeofluid Evidence: British Geological Survey, Hydrogeology Series, Research Report SD/89/2 (4).
- Sowiżdżał, A. (2016). Potencjał geotermalny zbiorników mezozoicznych niżej polskiego do produkcji energii elektrycznej. *Technika Poszukiwań Geologicznych*, 55(2), 105-115.
<http://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-7d5aed5c-edb8-4ecd-8dd5-47c4b79a951c>
- Sowiżdżał, A., Tomaszewska, B., & Chmielowska, A. (2019). Development of the Polish geothermal sector in the light of current possibilities of financial support for a geothermal investment. *E3S Web of Conferences*, 86, 00034.
<https://doi.org/10.1051/e3sconf/20198600034>
- Spalek, Angela (2025): Bundesverband Geothermie. URL: <https://www.tiefegeothermie.de/projekte/gross-schoenebeck-in-situ-geothermielabor> [last accessed: 17 Apr 2025]
- Stefánsson, A., Keller, N. S., Robin, J. G., & Ono, S. (2015). Multiple sulfur isotope systematics of Icelandic geothermal fluids and the source and reactions of sulfur in volcanic geothermal systems at divergent plate boundaries. *Geochimica et Cosmochimica Acta*, 165, 307-323. <https://doi.org/10.1016/j.gca.2015.05.045>
- Stober, I., Fritzer, T., Obst, K., Agemar, T., & Schulz, R. (2016). Deep geothermal energy: fundamentals and potential uses in Germany. Leibniz Institute for Applied Geophysics (LIAG).
https://www.geotis.de/homepage/sitecontent/info/publication_data/public_relations/public_relations_data/LIAG_Broschüre_Tiefe_Geothermie.pdf
- Stober, I.; Bucher, K. (2004): Fluid sinks within the earth's crust, *Geofluids*, 4., 143-151. <https://doi.org/10.1111/j.1468-8115.2004.00078.x>
- Szocs, T., Rman, N., Süveges, M., Palcsu, L., Tóth, G., & Lapanje, A. (2013). The application of isotope and chemical analyses in managing transboundary groundwater resources. *Applied Geochemistry*, 32, 95-107.
<https://doi.org/10.1016/j.apgeochem.2012.10.006>
- Tarcan, G. (2005). Mineral saturation and scaling tendencies of waters discharged from wells (> 150 °C) in geothermal areas of Turkey. *Journal of Volcanology and Geothermal Research*, 142 (3-4), 263-283.
<https://doi.org/10.1016/j.jvolgeores.2004.11.007>
- Tenzer, H., Genter, A., & Hottin, AM (1997). Exploration of the crystalline underground by extension drilling of the Urach 3 well in the framework of a feasibility study for a hot dry rock demonstration project; Exploration of the crystalline underground by extension drilling of the Urach 3 well in the framework of a feasibility study for a hot dry rock demonstration project. <https://www.osti.gov/etdeweb/biblio/573587>
- Terzic, J.; Miko, S. (2020): DELINEACIJA I KARAKTERIZACIJA TIJELA GEOTERMALNIH PODZEMNIH VODA U REPUBLICI HRVATSKOJ, Hrvatski Geoloski Institut
https://www.voda.hr/sites/default/files/dokumenti/delineacija_i_karakterizacija_tijela_geotermalnih_podzemnih_voda_u_rh.pdf
- Tischner, T., & Hesshaus, A. (2015). Geothermal energy extraction using generated geothermal systems (GeneSys), Part 1: Test work in the Horstberg Z1 borehole and sinking of the Groß Buchholz Gt1 borehole. sl: Schweizerbart'sche Verlagsbuchhandlung, 162-264. ISBN 978-3-510-96853-4
- TNO – Geological Survey of the Netherlands. (n.d.). *DINOloket*. <https://www.dinoloket.nl/> [last accessed: 12.02.2026]
- TNO – Geological Survey of the Netherlands. (n.d.). *NLOG – Boreholes*. <https://www.nlog.nl/en/boreholes> [last accessed: 12.02.2026]
- TNO – Geological Survey of the Netherlands. (n.d.). *NLOG – Temperature Data*. <https://www.nlog.nl/en/temperature-data> [last accessed: 12.02.2026]
- Tomaszewska, B., Bielec, B., & Kasztelewicz, A. (2016). Efektywność zatłaczania do górotworu wód termalnych o zmodyfikowanych właściwościach fizykochemicznych. *Przegląd Górniczy*, 72.
<http://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-c1ec7e4d-0006-44e1-b289-4bb099e5d6d5>

- Tomaszewska, B., Bielec, B., & Miecznik, M. (2015). Ocena uwarunkowań hydrogeotermalnych dla uzdatniania części schłodzonych wód termalnych. Model koncepcyjny systemu geotermalnego Podhala. *Przegląd Geologiczny*, 63(10/2), 1115-1121. <https://geojournals.pgi.gov.pl/pg/article/view/27731/19438>
- Tomaszewska, B., Bujakowski, W., Barbacki, A. P., & Olewiński, R. (2010). Zbiornik geotermalny jury dolnej w rejonie Kleszczowa [Lower Jurassic geothermal reservoir in the Kleszczów area]. *Przegląd Geologiczny*, 58(7), 603–608. https://www.pgi.gov.pl/images/stories/przeglad/2010rok/pg_2010_07_19.pdf
- Trumpy, E., & Manzella, A. (2017). Geothopica and the interactive analysis and visualization of the updated Italian National Geothermal Database. *International journal of applied earth observation and geoinformation*, 54, 28-37. <https://doi.org/10.1016/j.jag.2016.09.004>
- Tsankov Ts. et al. 1991. Geological map of Bulgaria, M 1:100 000, Map sheet Kazanlak K-35-051, Geology and Geophysics" AD, Sofia
- Tyszer, M.; Bujakowski, W.; Tomaszewska, B.; Bielec, B. (2020): Geothermal Water Management Using the Example of the Polish Lowland (Poland)—Key Aspects Related to Co-Management of Drinking and Geothermal Water, *Energies*, 13(10), 2412. <https://doi.org/10.3390/en13102412>
- Vandenbergh, N., Duser, M., Boonen, P., Fan, L. S., Voets, R., & Bouckaert, J. (2000). THE MERKSPAS-BEERSE GEOTHERMAL WELL (17W265). *Geologica Belgica*, 3, 3-4. <https://doi.org/10.20341/gb.2014.037>
- Vasile, M.; Bruggeman, M.; Van Meensel, S.; Bos, S.; Laenen, B. (2017): Characterization of the natural radioactivity of the first deep geothermal doublet in Flanders, Belgium, *Applied Radiation and Isotopes*, 126. 300-303, <https://doi.org/10.1016/j.apradiso.2016.12.030>
- Vasseur, H.; Kurfess, T.; Cagan, J. (1997): Use of a Quality Loss Function to Select Statistical Tolerances, *Journal of Manufacturing Science and Engineering*, 119(3), 410-416. <https://doi.org/10.1115/1.2831121>
- Vasseur, J. O.; Djafari-Rouhani, B.; Dorzynski, L.; Deymier, P. A. (1997): Acoustic band gaps in fibre composite materials of boron nitride structure, *Journal of Physics*, 9(35), 7327-7341. DOI <https://doi.org/10.1088/0953-8984/9/35/008>
- Vaute, L. (1998). Tests de traçage réalisés sur le site géothermique de Soultz-sous-Forêts (juillet–novembre 1997) (BRGM Report No. 40230, 39 pp.). Bureau de Recherches Géologiques et Minières (BRGM). <https://infoterre.brgm.fr/rapports/RR-40230-FR.pdf>
- Vidal, J., & Genter, A. (2018). Overview of naturally permeable fractured reservoirs in the central and southern Upper Rhine Graben: Insights from geothermal wells. *Geothermics*, 74, 57-73. <https://doi.org/10.1016/j.geothermics.2018.02.003>
- Vosgerau, H., Gregersen, U., Leth Hjuler, M., Dahl Holmslykke, H., Kristensen, L., Lindström, S., ... & Nielsen, L. H. (2016). Reservoir prognosis of the Gassum Formation and the Karlebo Member within two areas of interest in northern Copenhagen. The EUDP project" Geothermal pilot hole, phase 1b". Geological Survey of Denmark and Greenland report, 56, 138. <http://dybgeotermi.geus.dk/wp-content/uploads/Geothermal-pilot-hole-phase-1b.pdf>
- Voutsas, D., Dotsika, E., Kouras, A., Poutoukis, D., & Kouimtzi, T. (2009). Geochemical and isotopic characterization of thermal waters from the Loutraki geothermal system, Greece. *Journal of Hazardous Materials*, 172(3), 1264–1273. <https://doi.org/10.1016/j.jhazmat.2009.07.132>
- Vrouwe, B.J., Rutten R.F.X. (2012): Welltest analyse en log interpretatie HON-GT-01 en HON-GT-01-S1, NLOG_GS_PUB_Welltest analyse en log interpretatie HON1-2.pdf, <https://www.nlog.nl/brh-web/rest/brh/document/1562806302>
- Vrsaljko, D., Hećimović, I. & Avanić, R. (2007) Miocene Deposits of Northern Croatia. In: Grgasović, T. & Vlahović, I. (ed.) 9th International Symposium on Fossil Algae - Croatia 2007, Field Trip Guidebook and Abstracts. Zagreb, Hrvatski geološki institut, pp. 143-153. <https://www.bib.irb.hr:8443/340424>
- WaterPetroGaz Ltd. (2012). Chemical Analysis of Mineral Water from KEI No. 7 Sulfur Bath, Velingrad [Химичен анализ на минерална вода от КЕИ № 7 Сярна баня, Велинград]. Protocol No. 43/25.10.2012. <http://voda.velingrad.bg/images/files/Химичен-анализ-на-мин.-вода-от-КЕИ-№-7-Сярна-баня.pdf>
- Welter, S. (2018) Technisch-ökonomische Analyse der Energiegewinnung aus Tiefen-geothermie in Deutschland, Dissertazion der Universität Stuttgart. <https://doi.org/10.18419/opus-10254>
- Worden, R. H., Manning, D. A. C., & Bottrell, S. H. (2006). Multiple generations of high salinity formation water in the Triassic Sherwood Sandstone: Wytch Farm oilfield, onshore UK. *Applied Geochemistry*, 21(3), 455-475. <https://doi.org/10.1016/j.apgeochem.2005.12.007>
- Younger, P. L., Gluyas, J. G., & Stephens, W. E. (2012). Development of deep geothermal energy resources in the UK. *Proceedings of the Institution of Civil Engineers-Energy*, 165(1), 19-32. <https://doi.org/10.1680/ener.11.00009>
- Younger, P. L., Manning, D. A., Millward, D., Busby, J. P., Jones, C. R., & Gluyas, J. G. (2016). Geothermal exploration in the Fell Sandstone Formation (Mississippian) beneath the city centre of Newcastle upon Tyne, UK: the Newcastle Science Central deep geothermal borehole. *Quarterly Journal of Engineering Geology and Hydrogeology*, 49(4), 350-363. <https://doi.org/10.1144/qjgegh2016-053>

- Younger, P. L.; Manning, D. A. C. (2010): Hyper-permeable granite: lessons from test-pumping in the Eastgate Geothermal Borehole, Weardale, UK, *Quarterly Journal of Engineering Geology and Hydrogeology*, 43(1) 5-10.
<https://doi.org/10.1144/1470-9236/08-085>
- Younger, P. L.; Manning, D., A., C.; Millward, D.; Busby, J. P.; Jones, C. R. C.; and Jonathan G. Gluyas, J. G. (2016): Geothermal exploration in the Fell Sandstone Formation (Mississippian) beneath the city centre of Newcastle upon Tyne, UK: the Newcastle Science Central Deep Geothermal Borehole, *Quarterly Journal of Engineering Geology and Hydrogeology*, 49, 350-363. <https://doi.org/10.1144/qjegh2016-053>
- Zieba, E., & Grzesiak, E. (2010). Wpływ składu chemicznego wody geotermalnej na koszty eksploatacji systemu ciepłowniczego w Przycach. *Infrastruktura i ekologia terenów wiejskich*, (08/1).
<http://agro.icm.edu.pl/agro/element/bwmeta1.element.dl-catalog-0ac6daa5-72cb-484f-bbc1-a12ef4c0f5d1>
- Zimmermann, G., & Moeck, I. (2008). Geothermal research well in Groß Schönebeck—from design to stimulation treatment, *Brandenburg. geowiss. Beitr*, 15(1), 2. https://lbgr.brandenburg.de/sixcms/media.php/9/BGB-1-2_08_Zimmermann_155-164.pdf
- Ντότσικα, Ε., Πουτούκης, Δ., & Δαλαμπάκης, Π. (1998). Γεωχημική γεωθερμική μελέτη των θερμών νερών της περιοχής Τυχερού-Φυλακτού (Ν. Έβρου). Στα Πρακτικά του 40ου Υδρογεωλογικού Συνεδρίου, Θεσσαλονίκη, 1998.
- Πουτούκης, Δ., & Ντότσικα, Ε. (1998). Συμβολή της ισοτοπικής υδρολογίας και της υδρογεωχημείας στη μελέτη του γεωθερμικού πεδίου Αρίστινου ν. Έβρου= Contribution of isotope hydrology and hydrogeochemistry in the study of the geothermal field of Aristino area, Evros. *Δελτίον της Ελληνικής Γεωλογικής Εταιρείας*, 32(4), 69-79.
- Величков, В. ОЦЕНКА НА РЕСУРСИТЕ НА НАХОДИЩЕ НА МИНЕРАЛНИ ВОДИ САНДАНСКИ"-ОБЛАСТ БЛАГОЕВГРАД, ОБЩИНА САНДАНСКИ, ГР. САНДАНСКИ-ИЗКЛЮЧИТЕЛНА ДЪРЖАВНА СОБСТВЕНОСТ.
<https://www.wabd.bg/docs/dokladi/MINERALNIVODI/OcenresnahSandanski.pdf>
- ИНТЕРАКТИВНА КАРТА НА МИНЕРАЛНАТА ВОДА ВЪВ ВЕЛИНГРАД (2025). URL:
<http://voda.velingrad.bg/nachodishta/kamenitsa> [last accessed: 17 Apr 2025]
- Кожухаров, Д. (1989): Геоложка карта на България, К-35-086. <https://www.geokniga.org/maps/1123>
- Министерство на здравеопазването на Република България. (2014). Балнеологична оценка на сондаж №4 – Власа, Велинград – Каменица. Протокол №23/26.09.2014 г. Изтеглено на 29 май 2025 г. от <https://www.mh.government.bg/upload/6881/23-velingrad-kamenica-sondazh-4-vlasa-26-09-2014.pdf>
- Министерство на здравеопазването на Република България. (2014). Балнеологична оценка на стар каптаж – Кюстендил. Протокол №27/05.11.2014 г. Изтеглено на 30 май 2025 г. от https://www.mh.government.bg/upload/6877/27-kyustendil-kei-star_kaptazh-05-11-2014.pdf
- Министерство на здравеопазването на Република България. (2015). Балнеологична оценка на каптиран естествен извор – Момин проход. Протокол №42/11.05.2015 г. Изтеглено на 30 май 2025 г. от https://www.mh.government.bg/upload/6863/42-momin_prohod-kei-11-05-2015.pdf
- Министерство на здравеопазването на Република България. (2015). Балнеологична оценка на сондаж №13HG – Долна баня. Протокол №29/26.01.2015 г. Изтеглено на 30 май 2025 г. от https://www.mh.government.bg/upload/6875/29-dolna_banya-sondazh13hg-26-01-2015.pdf
- Министерство на здравеопазването на Република България. (2017). Балнеологична оценка на сондаж №MS3 – Левуново. Протокол №73/19.10.2017 г. Изтеглено на 30 май 2025 г. от <https://www.mh.government.bg/upload/6832/73-levunovo-sondazhms3-19-10-2017.pdf>
- Министерство на здравеопазването на Република България. (2017). Балнеологична оценка на сондаж №С3-8 – Павел баня. Протокол №68/08.08.2017 г. Изтеглено на 30 май 2025 г. от https://www.mh.government.bg/upload/6837/68-pavel_banya-sondazhsz-8-08-08-2017.pdf
- Министерство на здравеопазването на Република България. (2017). Балнеологична оценка на сондаж №6 – Марикостиново. Протокол №58/09.06.2017 г. Изтеглено на 30 май 2025 г. от <https://www.mh.government.bg/upload/6847/58-marikostinovo-sondazh6-09-06-2017.pdf>
- Министерство на здравеопазването на Република България. (2017). Балнеологична оценка на сондаж №2ВП – Хасковски минерални бани. Протокол №50/20.01.2017 г. Изтеглено на 30 май 2025 г. от https://www.mh.government.bg/upload/6855/50-haskovski_mineralni_bani-sondazh2vp-20-01-2017.pdf
- Министерство на здравеопазването на Република България. (2017). Балнеологична оценка на сондаж №5 – Хасковски минерални бани. Протокол №53/20.01.2017 г. Изтеглено на 30 май 2025 г. от https://www.mh.government.bg/upload/6852/53-haskovski_mineralni_bani-kei5-20-01-2017.pdf
- Министерство на здравеопазването на Република България. (2017). Балнеологична оценка на сондаж №1 – Рупите-Кожух. Протокол №55/05.06.2017 г. Изтеглено на 30 май 2025 г. от <https://www.mh.government.bg/upload/6850/55-rupite-kozuh-sondazh1vkr-05-06-2017.pdf>
- Министерство на здравеопазването на Република България. (2017). Балнеологична оценка на сондаж – Ерма река. Протокол №54/20.01.2017 г. Изтеглено на 30 май 2025 г. от https://www.mh.government.bg/upload/6851/54-erma_reka-sondazhermareka-20-01-2017.pdf

Министерство на здравеопазването на Република България. (2018). Балнеологична оценка на сондаж №6 – Симитли. Протокол №105/20.12.2018 г. Изтеглено на 29 май 2025 г. от <https://www.mh.government.bg/upload/6800/105-simitli-sondazh6-20-12-2018.pdf>

Министерство на здравеопазването на Република България. (2018). Балнеологична оценка на сондаж №1HG – Сапарева баня. Протокол №93/20.07.2018 г. Изтеглено на 29 май 2025 г. от https://www.mh.government.bg/upload/6812/93-sapareva_banya-sondazh1hg-20-07-2018.pdf

Министерство на здравеопазването на Република България. (2019). Балнеологична оценка на сондаж №6 – Сандански. Протокол №124/17.05.2019 г. Изтеглено на 29 май 2025 г. от <https://www.mh.government.bg/upload/6781/124-sandanski-sondazh6-17-05-2019.pdf>

Министерство на здравеопазването на Република България. (2019). Балнеологична оценка на сондаж №5 – Варвара. Протокол №109/02.01.2019 г. Изтеглено на 30 май 2025 г. от <https://www.mh.government.bg/upload/6796/109-varvara-sondazh5-02-01-2019.pdf>

Министерство на здравеопазването на Република България. (2020). Балнеологична оценка на каптиран естествен извор – Пчелински бани. Протокол №163/06.04.2020 г. Изтеглено на 30 май 2025 г. от https://www.mh.government.bg/upload/6743/163-pchelinski_bani-kei-06-04-2020.pdf

Министерство на околната среда и водите. (2012). Решение № 25 от 2012 г. за предоставяне безвъзмездно за управление и ползване на находище на минерална вода – изключителна държавна собственост Долна баня. https://www.moew.government.bg/static/media/ups/tiny/filebase/Water/Mineralnivotdi/Zapovedi_POS/25_Reshenie_2012_Dolna%20banya.pdf [last accessed: 15 May 2025]

Община Велинград. (2012). Химичен анализ на минерална вода от КЕИ №7 Сярна баня [Chemical analysis of mineral water from KEI No. 7 Sulfur Bath]. Протокол № 46/25.10.2012. Retrieved May 29, 2025, from <http://voda.velingrad.bg/images/files/Химичен-анализ-на-мин.-вода-от-КЕИ-№-7-Сярна-баня.pdf>

Община Велинград. (б.г.). Балнеологична оценка на сондаж №3 – Мизинка. Изтеглено на 29 май 2025 г. от <http://voda.velingrad.bg/images/files/Балнеологична-оценка-на-сондаж-№-3-Мизинка.pdf>

Пенчев, П.; Величков, В. (2011): Оценка на ресурсите на находища на минерални води за Симитли, 88. <https://wabd.bg/content/научни-разработки/>

Петров, П.; Маринов, С.; Лимонадов, К.; Страка, Ю. (1970): Хидрогеоложки проучвания на минералните води в България. Техника, София, 195.