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NEWSLETTER

2026 SPRING BROUGHT THE IDEAS - AND CLAUSTHAL DELIVERED

20TH STUDENT TECHNICAL CONGRESS AND EUROPEAN PETROBOWL® CHAMPIONSHIP

THIS EDITION'S EXCLUSIVE INTERVIEWS:

SPE PRESIDENT: JENNIFER MISKIMINS
Colorado School of Mines

EDNA MICHELLE BISSO BI MBA
Chairperson of SPE Germany

PROF. PHILIP JAEGER
TU Clausthal

THORSTEN HINZ
ExxonMobil

35 YEARS

SPE International
German Section

2026 SPE EUROPE REGIONAL AWARDS

Prof. Philip Jaeger, TU Clausthal
Distinguished Achievement Award for Petroleum Engineering Faculty

Dr. Oliver Czuprat, Harbour Energy
Drilling Engineering Award

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Philip Jaeger

Thorsten Hinz

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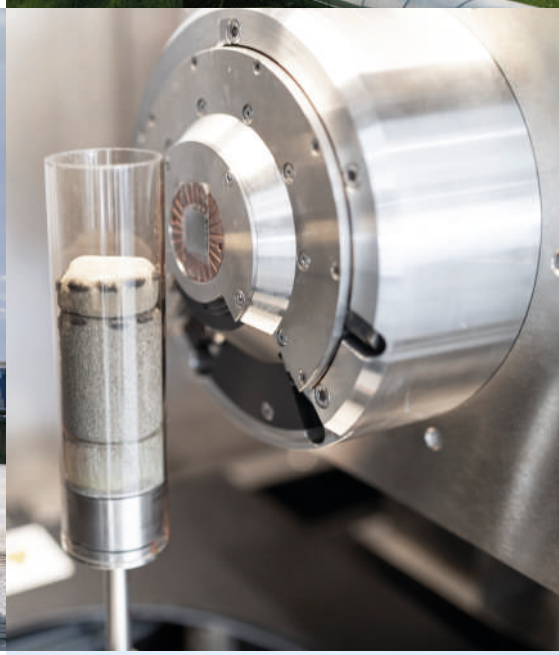

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EVENT CALENDAR

For latest information and details on SPE Germany events visit our website.

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Date	Type	Event	Location
19 June 2026	Meeting	GS-SPE Annual meeting	Celle, Germany
23-25 June 2026	Conference	SPE Europe Energy Conference	Istanbul, Türkiye
25 June 2026	SPE Webinar	The Role of the Geosciences in the Energy Transition	Online
20-21 July 2026	Conference	SPE Africa Geothermal Workshop	Nairobi, Kenya
10-11 Sept 2026	Conference	SPWLA NMR SIG Conference	Celle, Germany
15-16 Sep 2026	Conference	Celle Drilling 2026	Celle, Germany
21-22 Oct 2026	Conference	The German Geothermal Congress 2026	Potsdam, Germany
21-23 Oct 2026	Conference	SPE Annual Technical Conference and Exhibition	Houston, TX, USA
19-20 Nov 2026	Conference	DGMK Herbsttagung	Wien, Austria
2 - 5 Nov 2026	Conference	ADIPEC	Abu Dhabi, UAE
2 - 6 Nov 2026	Conference	EAGE Global Energy Transition Conference	Hannover, Germany
2 Mar 2027	Distinguished Lecture	Geomechanical Insights for Operational Excellence – Does Strain Matter?	Hannover, Germany
12 Apr 2027	Distinguished Lecture	Clean-up and Flowback – The Art of Well Start-up, Clean-up and Flowback. From Deep-Water to Unconventional	Hannover, Germany

German Section SPE Chairperson Letter

Edna Michelle Bisso Bi Mba, GSSPE Chair & Harbour Energy

Dear GSSPE members and colleagues,

As I share my **final message** in the SPE Germany Newsletter, I would like to sincerely thank each of you for your support over the past two years during my tenure as Chairperson of the German Section of SPE. Serving in this role has further strengthened my conviction in the value and impact of strong professional networks such as SPE.

Over these two years, I am proud that our section has maintained a high-quality technical program, offering a diverse mix of webinars and in-person lectures featuring outstanding speakers. Beyond this, we organized a wide range of events that successfully connected our members with a broader external audience.

A key achievement was the successful reactivation of the Young Professionals (YP) program, made possible through the dedication of our YP committee.

Among several initiatives, we continued the tradition of hosting the "*GSSPE YP Youngtimer Garage"* at the DGMK Spring Conferences in Papenburg (2025) and Münster (2026).

In June 2025, we set a benchmark by organizing an exceptional *Beyond the Borders Meeting* in Hanover, bringing together representatives from more than ten SPE sections. This spirit of collaboration continued in April 2026, when we celebrated the 20th anniversary of the *Student Technical Congress* (STC). The event gathered over 170 students, industry professionals, and associations from across Europe. STC 2026 stood out by integrating three major components into one event: a technical congress, the European PetroBowl competition with more than 16 European student chapters, and a job fair. This unique format created a dynamic environment where students could learn, compete, and build professional connections, bridging the gap between academia and industry.

We also strengthened ties between our board and student chapters through regular visits to Freiberg, Clausthal, and Aachen, while actively supporting exchanges and collaboration between student chapters.

In addition, we increased the engagement of our professional members by launching the *"Highlighted GSSPE Member of the Quarter"* series in our newsletter, showcasing the contributions of our community.

This year, our section was once again recognized at the regional level, with two members receiving prestigious awards. Congratulations to **Philip Jaeger**, recipient of the *Distinguished Achievement Award for Petroleum Engineering Faculty*, and to **Oliver Czuprat**, recipient of the *Drilling Engineering Award*.

My sincere thanks go to the GSSPE Board, extended board members, and the dedicated students in our chapters whose commitment made every event and initiative possible. I would also like to express my gratitude to our sponsors, whose support enabled us to deliver these activities. Most importantly, thank you to all GSSPE members for your engagement, ideas, and continued support.

I wish the new Board every success and encourage us all to continue working together to ensure that SPE Germany remains a strong platform for educating petroleum professionals and connecting us to a global network.

Glück auf,
Edna,
SPE Germany Chairperson

Interviewed by: Barbara Cortez and Marcela Vargić

Student Technical Congress 2026: Shaping the Future of Energy

Interviews with Professor Philip Jaeger, Dr. Thorsten Hinz, Edna Bisso Bi Mba and Dr. Jennifer Miskimins

The Student Technical Congress (STC) 2026 in Clausthal brought together students, academics, and industry leaders from across Europe to explore the future of energy and the role of young professionals in shaping it. Through a series of conversations with key guests and organizers, a clear message emerged: STC is not just a conference, but a training ground for the next generation of energy leaders.

Professor Philip Jaeger of TU Clausthal, faculty advisor of the university's SPE chapter, emphasized how uniquely formative this event is for students. Over the course of a year, they plan and organize a full-scale conference hosting around 150 participants from all over Europe. In his view, the learning effect of managing such a complex event far exceeds what can be achieved in a classroom. The organizational experience, the responsibility, and the need to collaborate across cultures and disciplines give students a kind of practical education no lecture can replicate. During the conference days themselves, students not only network and learn from peers and professionals, but many also present in front of a large audience for the first time — a milestone that builds confidence and communication skills early in their careers.

Figure 1. Prof. Philip Jaeger and Barbara Cortez

Figure 2. Dr. Thorsten Hinz and Marcela Vargić

Industry representatives, too, see STC as a vital bridge between education and practice. Dr. Thorsten Hinz from ExxonMobil described the congress as a remarkable opportunity to connect with motivated students and share insights from his professional journey. He was particularly impressed by the level of commitment on display: students devote their free time to preparing presentations, engaging in technical discussions, and bringing forward new ideas. For him, being part of STC is both exciting and an honor. His key advice to young petroleum engineers and geoscientists is to stay the course while keeping an open mind — maintaining curiosity about both technical and societal developments. The broader their interests, he argued, the more diverse and exciting the opportunities that will arise throughout their careers.

From the perspective of SPE Germany, the national section behind STC, investing in students is a strategic priority. Edna Michelle Bisso Bi Mba, chairperson of SPE Germany, highlighted that the energy industry's primary mission — delivering safe and reliable energy to the world — depends on well-educated, enthusiastic, and passionate professionals. Today's students, she noted, are tomorrow's senior managers, leaders, and experts; building a strong talent pipeline is therefore essential. SPE Germany supports STC by sharing experience, leveraging its industry network, and securing sponsorship to make a high-quality event possible. What makes STC stand out among other conferences, in her view, is its strong focus on students. Participants submit abstracts, present their work to a diverse panel of industry representatives and fellow students, and receive concrete, constructive feedback that helps them grow professionally and personally. This year's PetroBowl championship, bringing together 16 teams from universities across Europe, further reinforces the event's role as a hub for networking and collaboration. Her message to any student considering involvement with SPE or STC is simple and direct: don't overthink — join, because the opportunities you will discover may surprise you.

Figure 3. GSSPE Chairperson Edna Michelle Bisso Bi Mba

Figure 4. 2026 SPE President Jennifer Miskimins and Barbara Cortez

The global outlook of STC was underscored by SPE President Jennifer Miskimins (from Colorado School of Mines), who bridges both industry and academia. She began her career at Marathon Oil before moving into teaching, a shift driven by her passion for education and her desire to experience the academic side of the industry. For her, the chance to combine a love of teaching with hands-on work with students made the transition a natural and rewarding step. She also speaks openly about the importance of conversation in rebuilding the industry's reputation. When people question or challenge her work in the petroleum sector, she first asks whether they are genuinely willing to engage in a real discussion. If they are, she takes the time to explain the nuances and complexities of energy systems, emphasizing that the issues are not black and white and that meaningful dialogue requires patience and openness from both sides.

Dr. Miskimins also reflected on her role as only the third SPE president from academia and the sixth woman to hold the position. While she hadn't focused on the statistics until others pointed them out, she vividly remembers the first female SPE president, who later became a personal friend. She is optimistic that more women will follow, noting that serving on the SPE Board of Directors is a prerequisite for the presidency and that more women are now joining the board.

She expects this to translate into greater female representation in leadership roles in the future, both from academia and industry. Turning to the concerns about shrinking petroleum engineering enrollments, she firmly believes that the degree “still makes sense.” While acknowledging the growth of other energy sources, she stresses that all credible projections show oil and natural gas remaining a major share of global energy supply for decades to come. She also highlights the transferability of petroleum engineering skills — such as expertise in fluid flow and porous media — to areas like geothermal energy, hydrogen, and carbon capture and storage. For her, the message to prospective students is clear: this is not a dying industry, and the world still needs talented young engineers to solve complex energy challenges. Personally, she views serving as SPE president as a “career topper” and a once-in-a-lifetime opportunity, and she hopes simply to remain active and keep working with young people, who, as she puts it, help keep her young as well.

Taken together, these voices paint a coherent portrait of STC 2026 as a student-centered, future-oriented event that blends rigorous technical discussion with real-world skills and global networking. Students learn by doing — organizing, presenting, debating, and collaborating — while engaging directly with industry leaders and academic mentors. They gain insights into the evolving energy landscape, discover the breadth of career paths open to them, and build the confidence to take on leadership roles in the years ahead. For anyone considering attending or supporting STC, the message from all interviewees is unanimous: this congress is a unique opportunity to grow, connect, and contribute to the future of the energy industry.

Written by: Akib Ahmed[1], Daniel Fillers[2], Garri Gaus[3], Michael Kettermann[3], Peter Achtziger-Zupančič[3]
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Natural Hydrogen Exploration in the Upper Rhine Graben.

Based on the Poster presented during the Student Technical Congress in Clausthal, where it was awarded second place

Introduction

The global energy transition is driving an urgent search for carbon-free primary energy resources. While industrial hydrogen production, predominantly "blue" or "green," occupies much of the current discourse, "white" or natural hydrogen (H_2) has emerged as a promising subsurface resource with the potential to provide a continuous, primary supply. Discoveries in Mali have demonstrated that natural H_2 sustainably generated by subsurface geochemical processes. This has prompted targeted exploration programs and legislative adaptations in countries such as France, Australia, Brazil, Canada and Spain.

Natural hydrogen is generated through several distinct pathways, including the serpentinization of iron rich minerals, the radiolysis of water molecules by radioactive elements and the thermal cracking of organic matter at high temperatures. However, the primary challenge for the industry lies not just in understanding generation but in identifying the migration pathways and surface indicators that signal deep accumulations in reservoirs.

The aim of this research was to investigate whether natural hydrogen is escaping to the surface in the Upper Rhine Graben (URG) in Germany, specifically in the Landau region and if so, what controls its migration pathways. While hydrogen has been observed in several basins worldwide, the mechanisms that constrain process of accumulation or migration remain poorly understood in temperate, sediment-covered rift settings such as the Upper Rhine Graben. Proving the presence of natural H_2 at shallow depth can help define early exploration indicators and guide future subsurface assessments.

Site description

In Germany, historical data from deep boreholes (e.g., the German Continental Deep Drilling Program-KTB), deep potash mines and structural basins have long indicated localized occurrences of natural hydrogen. When evaluating these signals alongside the distribution of hydrogen-generating rocks and elevated thermal regimes, the Upper Rhine Graben (URG) stands out as an exceptionally viable structural environment for natural hydrogen systems. The rifting history of the graben involved profound crustal thinning and mantle upwelling, which left a legacy of anomalous geothermal conditions. The average geothermal gradient within the region reaches 5-6°C per 100 meters, driving subsurface temperatures to 120-150°C at depths of just 3 km.

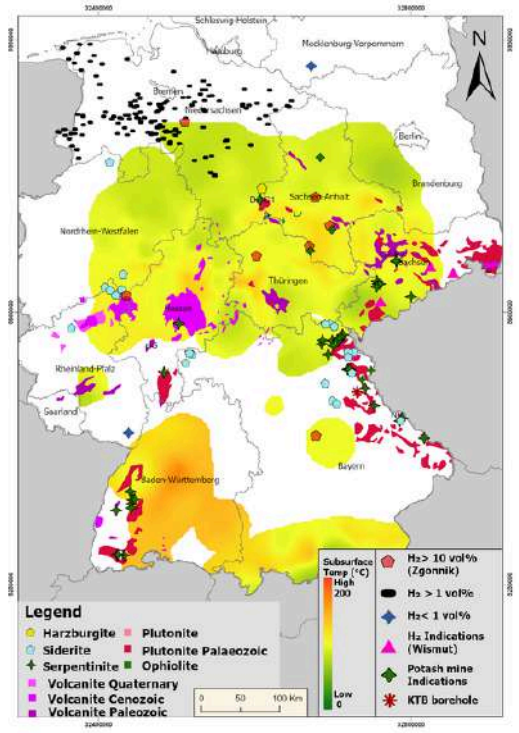

Fig 1: An inventory of documented hydrogen occurrences in Germany was compiled from published literature and datasets (Zgonnik, 2020; Wismut GmbH; BGR; Mineralienatlas, 2001). Subsurface temperature distributions at 3 km depth were derived from the geothermal dataset of Agemar et al. (2012). Coordinate system: EPSG 25832.

The presence of iron-rich granitic rocks and the potential presence of ultramafic basements with significant potential for hydrothermal alteration, provides the mineralogical "fuel" for hydrogen producing water-rock interactions. Furthermore, the deep-seated fault networks that define the URG act as potential conduits. Seismic data indicate that major border faults extend into the Variscan basement to depths of 3-6 kilometers, offering a direct link between deep generation zones (the "hydrogen kitchen") and the near-surface environment.

The specific focus area of this field investigation is situated along the western margin of the URG, stretching from Landau in the north to Bad Bergzabern in the south. This area encompasses key localities such as Insheim, Albersweiler, Gleisweiler and Eschbach, situated along the transition zone between the graben's central trough and the uplifted Vosges Mountains.

Methods

To map and quantify subsurface hydrogen expressions, this study employed a multi-tiered research workflow integrating macroscale structural remote sensing, in situ physical soil-gas sampling and geostatistical modeling.

Also, before commencing field campaigns, a Sobel-based edge-detection and lineament extraction workflow was executed in QGIS. Utilizing Sentinel-2 multispectral imagery and digital elevation models (DEM), this process mapped major fault trace lines, structural steps, and lineament intersections along the graben margin. The results directly informed the spatial placement of field transects, ensuring sampling points crossed perpendicular to major structural features.

The research involved field campaigns in the Landau region, focusing on the western border of the Upper Rhine Graben. A total of 71 in situ soil-gas measurements were recorded using a Dräger X-am 8000 sensor. This device enabled simultaneous measurement of H_2, CO_2, CH_4, O_2 and H_2S. At each site, a heavy-duty steel probe was mechanically driven to a uniform depth of 1 meter.

A specialized mechanical isolation and sealing system was deployed within the borehole to prevent atmospheric air infiltration into the target horizon.

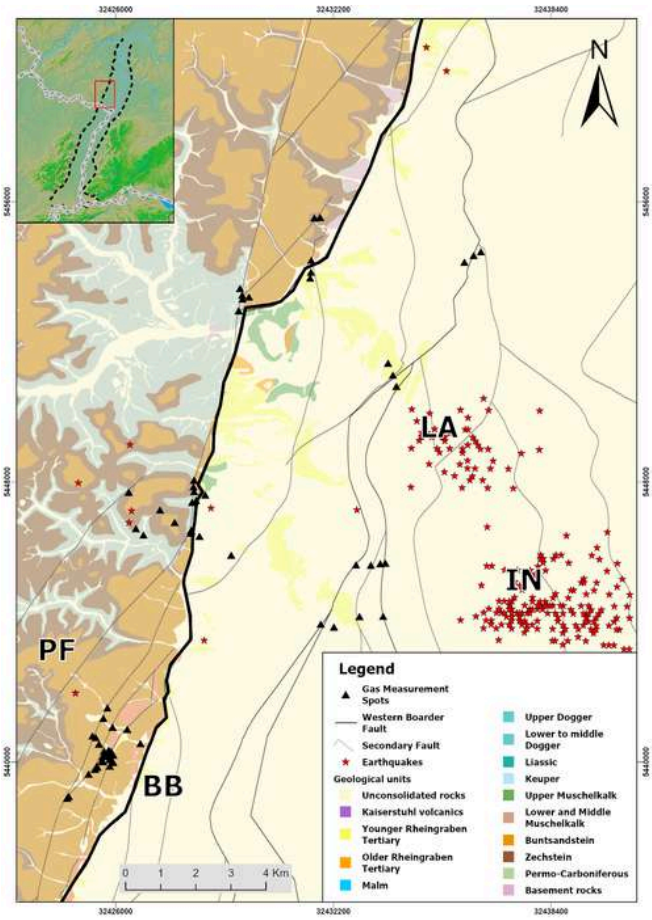

Fig 2: Gas sampling sites from the field campaign overlaid with earthquake locations (BGR), fault traces, and geological units (GeORG-Projectteam, 2012). Major cities shown include LA (Landau), IN (Insheim), BB (Bad Bergzabern), and PF (Palatinate Forest). Coordinate system: EPSG 25832.

A critical hurdle in surface hydrogen exploration is the reliability of soil gas signals. Conventional high-speed drilling can generate significant mechanical friction and heat. At the drill bit, this thermal energy causes the breakdown of organic material in the soil, producing artificial hydrogen peaks that do not reflect genuine subsurface seepage. These artifacts typically decline rapidly, often falling below 1 ppm within hours of the initial measurement.

To mitigate these risks, this study established a manual driven (hammering) workflow. With manual hammering rather than high-speed mechanical rotation, thermal artifacts were minimized.

For laboratory validation, discrete gas volumes were sealed inside specialized stainless-steel gas containers. These samples were transferred to the Petrophysics Laboratory at RWTH Aachen University and analyzed under ultra-high vacuum conditions using a GSD350 OmniStar quadrupole mass spectrometer to confirm elemental concentrations and verify baseline calibrations.

At 1m depth, atmospheric mixing and microbial consumption are significantly reduced compared to shallow soil layers (less than 50 cm), providing a more stable environment for detecting deep-sourced gases. To confirm the repeatability and authenticity of the findings, anomalous readings were subjected to 24-hour repetition tests. In several cases, high concentrations remained steady or returned to similar peak values (e.g., >2000 ppm) after a day, suggesting sustained seepage rather than a transient artifact.

Raw dataset matrices were statistically processed to evaluate gas relationships and environmental controls. Pearson and Spearman rank correlation matrices quantified the dependencies between gas types, distance to faults and weather variables. Because the empirical gas concentration data deviated from standard normality at the extremes, the non-parametric Mann-Whitney U test was used to rigorously assess how soil textures affect gas retention. Anomaly classification thresholds were established through comparative fitting of Gaussian and Log-Normal probability distributions. Finally, spatial interpolation across the high-density Bad Bergzabern area was performed using Ordinary Kriging.

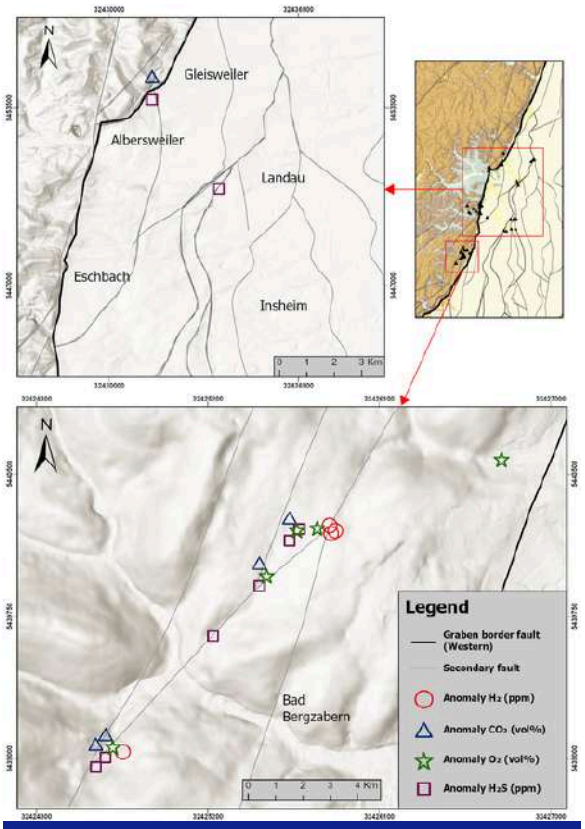

Fig 3: Spatial distribution of anomaly in different gas concentrations. Coordinate system: EPSG 25832.

Results

The field data confirmed the presence of natural hydrogen in the shallow soil profiles along the western margin of the Upper Rhine Graben. H_2 concentrations reached distinct anomalous levels, particularly in the Bad Bergzabern area, with peak concentrations exceeding 2000 ppm (0.2 vol%).

1. Structural Proximity and Fault Controls: Spatial analysis demonstrated strong structural control over gas distribution. The highest concentrations of H_2, CO_2 and H_2S clustered close to fault lines. When mapped against the structural architecture, the most intense H_2 anomalies aligned with faults and fault intersections, such as the triple-fault junction identified in the Bad Bergzabern area. This confirms that these fault networks serve as effective pathways through structurally open and connected permeability.

2. Soil Texture and Grain Size Modulation: The study also revealed that surface gas signatures are heavily influenced by the physical properties of the shallow soil profile. The dataset was grouped into two primary textures: coarse-grained soils (sands and silts typical of elevated ridge settings) and fine-grained soils (clay-rich profiles typical of the graben basin floor). Coarse-grained soils exhibited a mean H_2 concentration of 392 ppm and a peak of >2000 ppm. In contrast, fine-grained, clay-rich soils showed a much lower mean concentration of 112 ppm and a peak of 665 ppm. The difference in hydrogen levels tested to be significant between soil types and not due to random variation.

3. Behavior during measurements: For each sampling location, time series data were collected for 3 minutes at a 15-second resolution. These data highlight distinct degassing behaviors. Sandy ridge locations showed rapid gas release; concentrations spiked immediately upon probe insertion and then dropped sharply within 15 to 30 seconds. Conversely, the clay-rich basin sites exhibited delayed, lower-intensity, or intermediate build-up curves, demonstrating how lower soil permeability retards fluid movement.

Interpretation and Outlook

The alignment of intense H2 anomalies with fault intersections indicates that these fault networks maintain sufficient open structural permeability to serve as effective pathways. This is encouraging for the future of natural hydrogen exploration in Germany, as it confirms that active hydrogen systems are available in the URG. The development of a manual hammering workflow provides a reliable methodology to avoid drilling artifacts, while the identification of soil texture influences allows improved interpretation of surface data.

As the search for clean energy intensifies, these results provide both a developable methodological framework and evidence base for natural hydrogen as a potential additional primary energy resource in Germany.

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Written by: Barbara Cortez., TU Clausthal.
Supervised by: Reinel Echavez, TU Clausthal.

Influence of salinity and water density on the diffusivity of natural hydrogen in sedimentary rocks.

Based on the Poster presented during the Student Technical Congress in Clausthal, where it was awarded third place

Introduction

Our society's energy consumption has been increasing over the last decades. According to the IEA the Global energy demand grew by 2.2% in 2024, a notably faster rate than the annual average of 1.3% seen between 2013 and 2023; and Renewables Energies accounted for the largest share of the growth in total energy supply with 38%. In this context, natural hydrogen is emerging as a promising renewable energy source that could further increase the share of clean energy in the global mix.

Natural Hydrogen as a Resource

Natural hydrogen is generated within the continental crust by two key mechanisms, water–rock reactions where Fe2+, dominantly in ultramafic rocks, is oxidized to Fe3+, and by radiolysis of water via radioactive elements U, Th and K found in upper-crustal rocks. It is present in various geological settings, including mid-ocean ridges, continental rifts, ultrabasic rock formations, and sedimentary basins (Lodhia et al., 2024). These environments facilitate hydrogen generation via mechanisms such as serpentinization, radiolysis of water, and microbial activity (Echavez et al., 2025).

Migration of natural Hydrogen.

The migration of natural hydrogen in the subsurface is controlled by a combination of physical processes, primarily diffusion and advection. Due to its small molecular size and low molecular weight, hydrogen diffuses faster than most other gases through porous geological formations (Echavez et al., 2025). This high diffusivity enables rapid dispersion, especially in low-pressure or unsaturated zones.

The next figure (Figure 1), shows how hydrogen and helium move through the Earth's mantle. Arrows indicate the flow of materials through different parts of the Earth, such as mid-ocean ridges (MORB), ocean islands (OIB), and arc/backarc regions.

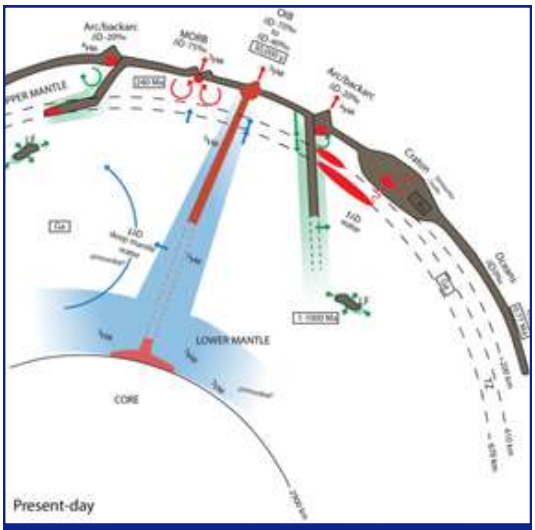

Figure 1. Conceptual model for primordial or deep mantle hydrogen and helium migration through Earth and present-day subduction patterns (Lodhia et al., 2024).

Water Bridge

Increasing salinity and density of pore fluid within sedimentary rocks lead to the formation of water bridges and increased connectivity between brine molecules, inhibiting the diffusion hydrogen. This water bridge is represented in Figure 2, where red circles are hydrogen molecules and diffusion rates of hydrogen (DH) in air are up to five orders of magnitude greater than in water and are indicated by double and single arrows, respectively. (Lodhia et al., 2024).

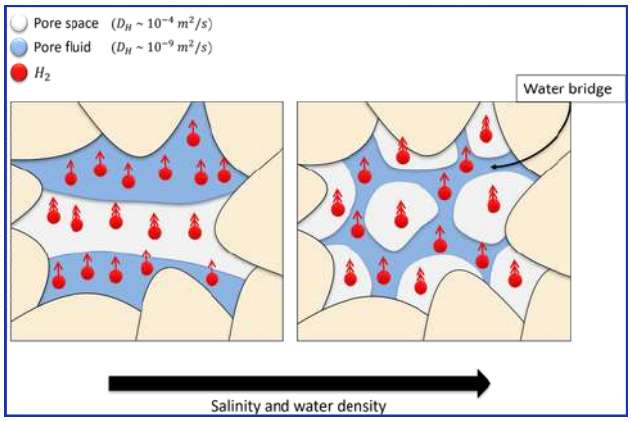

Figure 2. Effects of increasing salinity and water density on hydrogen diffusivity (Modified from Lodhia et al., 2024)

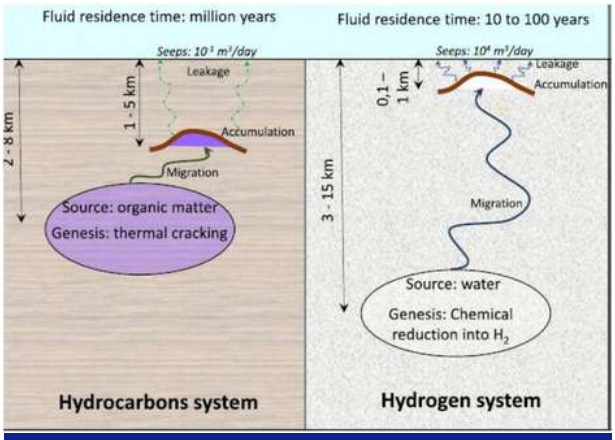

Figure 3. Effects of increasing salinity and water density on hydrogen diffusivity (Modified from Lodhia et al., 2024)

Natural Hydrogen System vs. Hydrocarbon System

The hydrocarbon system is a conceptual model designed to understand the occurrence of petroleum within geological basins. It has been employed by petroleum geologists for decades to effectively guide oil and gas exploration and to assess undiscovered petroleum resources (USGS, 2023). This system relies on the slow transformation of organic matter into oil and gas over millions of years under high pressure and temperatures between 80 °C - 200 °C (Jackson et al., 2024). In contrast, the natural hydrogen (NH) system involves the ongoing generation of hydrogen through reactions between water and rocks, particularly ultramafic or iron-rich rocks like those involved in serpentinization, at temperatures between 200 °C - 300 °C (Jackson et al., 2024; (Shaposhnikov, 2024). Unlike hydrocarbons, which originate within sedimentary basins, hydrogen is often produced in the crystalline basement and migrates upward through overlying sedimentary layers (Zhao et al., 2023).

In Figure 3, a synthetic comparison of geological hydrocarbon systems and hydrogen systems is represented.

Conclusions and Outlook.

- Natural hydrogen (H_2) holds substantial promise as a clean and sustainable energy source capable of significantly contributing to the global energy mix.
- Increasing salinity and density of pore fluid within sedimentary rocks leads to the formation of water bridges, inhibiting the diffusion of hydrogen.
- Salinity and water density are key factors that substantially reduce hydrogen diffusivity.
- Despite a broadly similar system architecture, natural hydrogen and hydrocarbon systems operate under very different geological, thermal, and temporal regimes.
- Leveraging decades of experience and methodologies from the oil and gas industry will be instrumental in advancing natural hydrogen exploration and exploitation.

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Written by: Fidel Lopez Gomez1,2 and Jens Pfeiffer2
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The effect of heating rate on Wax Disappearance Temperature (WDT) measurements by the Cross-Polarization Translucency (CPT) method

Based on the work presented during the East Meets West Congress in Krakow, where it was awarded second place in the SPE Student Paper Contest Master's Level Category.

Keeping crude oil flowing through production and transportation systems is one of the central problems of flow assurance, and it depends on how fluid composition, flow regime, and thermal conditions interact.

Wax Appearance Temperature (WAT), Wax Disappearance Temperature (WDT), and motivation for the study

Wax deposition may occur when the temperature of the fluid drops below the Cloud Point or Wax Appearance Temperature (WAT), which is defined as the temperature at which the first paraffin crystal forms. Multiple experimental methods exist for measuring WAT: Differential Scanning Calorimetry, Ultrasonic Methods, Cross-Polar Microscopy, and Cross-Polarization Translucency, to name a few. However, WAT measurements depend on the methodology and the sample cooling rate: the faster the cooling rate, the lower the measured WAT, because nucleation is delayed and the system subcools before the first stable crystals form.

Formation of wax deposits is reversible, and the temperature at which the last precipitated paraffin redissolves in the oil is known as the Wax Disappearance Temperature (WDT). The literature on experimental studies regarding WDT measurements is limited. This study closes part of the gap by measuring how the heating rate affects the measured WDT.

Experiment: Samples and Equipment

For this study, the WAT and WDT of one condensate and four oil samples with different wax contents were measured using the Optical Wax Detector (OWD) developed by PSL Systemtechnik, Germany.

The key features of this device are that it allows precise control of both heating and cooling and does not require a minimum heating or cooling rate, unlike the Differential Scanning Calorimetry method. Additionally, the OWD runs as a fully automated process, preventing measurements from being biased by subjective perception.

The measurement principle of the Optical Wax Detector (OWD) is the Cross-Polarization Translucency (CPT) method, which relies on the ability of hydrocarbon crystals to rotate the polarization plane of light passing through the wax crystal; these changes are recorded as the WAT or the WDT, depending on whether the sample is being cooled or heated. Figure 1 shows a schematic of the OWD.

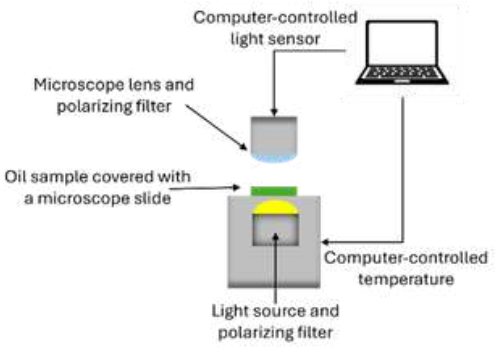

Figure. 1. Optical Wax Detector (OWD) operation

The OWD uses two polarizing filters, crossed at 90° to each other, with the sample in between.

When the sample is fully liquid, light from the source is polarized by the first filter, passes straight through the liquid oil, and then hits the second filter, which is rotated by 90°, blocking the polarized light so the sensor at the top does not detect anything.

As the sample cools down and the first wax crystals form, they reorient the plane of polarization of the light passing through them. Now, a portion of the light is rotated enough to pass through the second filter and reach the sensor. The associated jump in the signal is what the instrument registers as the WAT.

During heating, the process runs in reverse: as crystals melt, less light is reoriented, and the signal returns to baseline. The temperature at which it returns to zero is the WDT of the sample.

The present study systematically varied the heating and cooling rates (0.10, 0.25, 0.50, 1.0, 2.0 °C/min) for the five samples to measure their respective WAT and WDT.

Sample	Pour Point	Wax Content
Condensate-1	18.1 °C	1.80%
Oil-1	2.3 °C	0.60%
Oil-2	6.0 °C	4.10%
Oil-3	9.9 °C	4.40%
Oil-4	20.7 °C	6.50%

Table 1. Testing samples

Experimental Results

Using Oil-2 as an example (Figure 2), the experiment starts at 50 °C, where the sample is fully liquid, the light intensity detected by the OWD is zero, and no polarized light reaches the sensor.

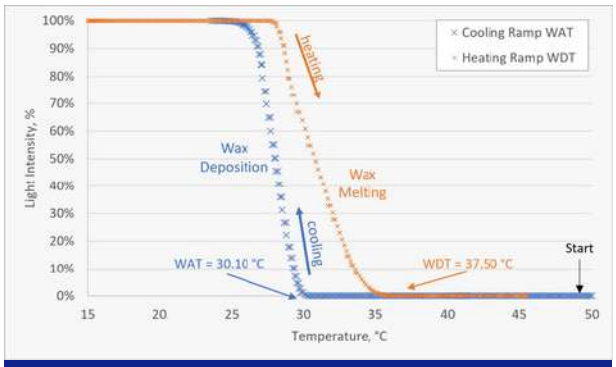

Figure 2. Example of the thermal trajectory for a sample to measure WAT and WDT

The device cools the sample down at 2 °C/min. Following the blue curve to the left, the signal remains at zero until it suddenly increases; the temperature at which the signal increases is where the first wax crystals formed and reoriented the polarized light, which, by definition, is the WAT. The sample was further cooled down, inducing extensive wax crystallization. The process was then run in reverse. The orange curve shows the heating ramp at 2 °C/min. As the wax melts, the signal gradually decreases to baseline. The point where it returns to zero is the WDT.

The same experimental process was repeated for the other thermal rates (0.10, 0.25, 0.50, and 1.0 °C/min) and for all samples.

Key Findings

When plotting the result for the WAT and WDT measurements at different thermal rates for Oil-2 (Figure 3), we can make two main observations:

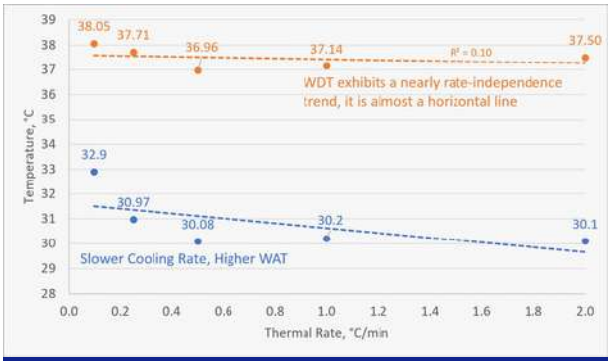

Figure 3. WAT and WDT for all thermal rates in Oil-2

1. The blue line represents the five WAT measurements. As the cooling rate decreases, the WAT increases. That is a non-linear but consistent trend. Slower cooling gives the system more time to form stable crystal nuclei, so the measured WAT approaches the true thermodynamic phase boundary. This behaviour is well documented in the literature and confirmed by my results.
2. The orange line represents the five WDT measurements, and it is constant over the different heating rates within the given uncertainty; the R^2 for a linear regression is 0.10, meaning the heating rate explains almost none of the variance in WDT. For practical purposes, the WDT is nearly independent of heating rate.

The experimental results may be explained by the fact that the crystallization process requires the organization of molecules into so-called nuclei, the first crystals formed during cooling. The process is governed by an energy barrier that must be overcome to reach a higher state of order, but forming crystals also requires time to arrange the molecules in a specific pattern. Once the first stable crystals form, the subsequent molecules are quickly organized according to the given crystal structure, making the WAT rate-dependent.

On the other hand, WDT is measured during heating; existing crystals are continuously dissolved. There is no energy barrier to cross; dissolution is a purely thermodynamic process. Once the temperature reaches the liquidus point, the last crystal can melt without delay. That is why WDT is nearly rate-independent.

The other samples corroborated these findings. Across all five samples, tested at five thermal rates and with different wax contents, WDT was nearly independent of the heating rate in all cases. Table 2 shows the R^2 for the linear regression of the WDT measured at the five thermal rates for each sample.

Sample	R2 for WDT measurements
Condensate-1	0.09
Oil-1	0.08
Oil-2	0.1
Oil-3	0.08
Oil-4	0.04

Table 2. WDT exhibits a nearly rate-independent trend (R2 close to zero)

Conclusions

- The results of these experiments show a clear hysteresis between crystallization and melting due to nucleation.
- WDT measurements are less dependent on the thermal kinetics, which in turn strongly affect the WAT.
- WDT reflects the true liquid-solid saturation temperature.
- Using WDT measurements to calibrate and validate predictive thermodynamic models of wax deposition should provide a better approximation to field conditions.

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THINKING AHEAD

Written by: Jonas Eckhardt, Kevin Rauche, Leonie Gelbrich und Josephine Ludwig.

Brazil Field Trip of the IBF and SPE Student Chapter TU Bergakademie Freiberg.

The field trip organized by the Institute for Drilling Engineering and Fluid Mining (IBF) at TU Bergakademie Freiberg, in collaboration with the Freiberg Student Chapter of the Society of Petroleum Engineers, has already become something of a tradition. We would therefore like to extend our heartfelt thanks to our sponsors, who made this year's excursion to Brazil from February 28, 2026, to March 14, 2026, possible on such a scale. Special thanks also go to the companies and supporters on the ground in Brazil, who welcomed us so warmly to their country.

Figure 1. Start of the Fieldtrip at Dresden Airport

After a successful departure from Dresden, our group of students landed in São Paulo on March 1, 2026, from where we set off for São Sebastião, our first stopover. We used the time until our supervisors arrived on March 2, 2026, to explore the small port town and the nearby island of Ilhabella. There, we were able to observe KNOT oil tankers anchored off the coast, supplying the regional transshipment hub for Petrobras.

On the way to Guaratinguetá, we stopped in Taubaté on March 3, 2026, where we were welcomed in a hospitable atmosphere at One Subsea – SLB. The facility in Brazil primarily manufactures subsea production and processing systems for Petrobras, which we were able to observe in their own production and assembly halls during a guided tour with Cristiano Oliveiro and Marius Müller.

Our next stop was the LIEBHERR facility in Guaratinguetá, which has been operating in Brazil since 1974. Kauan Lemes gave us an overview of the company's product portfolio, highlighting various aspects of the mining, earthmoving, and maritime crane sectors.

On a 900,000 m² site, with approximately 200,000 m² of production and assembly halls, various components are manufactured for the local market.

Figure 2. Liebherr factory premises

LIEBHERR offers a wide range of options, from port cranes and ship cranes to dedicated offshore cranes, which are used for wind, gas, and oil projects and in subsea pipe handling.

On March 5, we visited the Guaratinguetá campus of UNESP. As one of Brazil's leading public universities, UNESP spans a total of 24 campuses across the state of São Paulo and has approximately 46,000 enrolled students. The campus we visited in Guaratinguetá is home to the Faculty of Engineering and Sciences and is considered a major center for engineering research and education in the region. The campus focuses its research on forward-looking energy topics. Research is being conducted, among other things, on microbiological energy production, the conversion of biogas into hydrogen, and anomaly detection in oil wells.

This exchange demonstrated a mutual interest in deepening German Brazilian university cooperation.

Figure 3. Professor Reception at UNESP

The following day's itinerary included a visit to **UNIFEI.** Here, too, the day began with presentations about the university. Founded in 1913, this federal university is relatively small, with approximately 7,400 students, yet it boasts a remarkably robust research infrastructure. With eight research centres and more than 200 laboratories, UNIFEI is one of Brazil's most research-intensive institutions, particularly in the fields of renewable energy and hydrogen technologies. A key highlight of the program was a tour of the hydrogen laboratory and the institute's own hydrogen production facility. Research in the laboratory focuses on the development and use of hydrogen as a vehicle fuel. The electrolysis plant, known as the Green Hydrogen Centre (CH2V), which was inaugurated in 2024, features a 300-kW PEM electrolyzer powered by solar energy that produces approximately 100 kg of hydrogen daily.

Figure 4. Green Hydrogen Center at the UNIFEI in Itajubá

Throughout the day, we were accompanied by members of the SPE Student Chapter at UNIFEI, who proved to be exceptionally dedicated hosts.

Figure 5. UNIFEI SPE Student Chapter

On March 8, we took a detailed city tour of Rio de Janeiro. A highlight of the tour was a visit to the **Christ the Redeemer statue**, which is not only considered the city's landmark but also offers a breathtaking view of the bay and the surrounding neighbourhoods. Later, we passed the **Sambadrome**, the venue for the famous Carnival parades. We then visited the **Metropolitan Cathedral**, whose extraordinary architecture stands out distinctly from traditional church buildings. Another highlight was a visit to the colourful **Selarón Steps**, which captivate visitors with their artistic design. The tour concluded with an exterior tour of the **Maracanã Stadium**, considered one of the most significant soccer stadiums in the world and an important part of Brazilian sports culture.

March 9 was all about research and technological development. Our day began at the Petrobras Research Center (CENPES), with a tour of the research centre's expansive grounds, which, with over 100 laboratories, is one of the most significant facilities of its kind. Particularly noteworthy are the Hydrogen Technology Lab, the Well Technology Lab, and the Core Lab, where we were introduced to current research projects and technical processes.

Figure 6. Guided Tour at the Petrobras Research Center

On March 10, we set off from Rio de Janeiro to Macaé, a key hub of Brazil's offshore industry.

March 11 focused on the major offshore hub of Macaé. Our day began with a visit to Baker Hughes.
In the Drilling Equipment Hall, we viewed modern rotary steerable drilling assemblies for directional drilling and were granted access to the hydraulic laboratory, where stress tests on the BCPM units are conducted.

Figure 7. Visit at Baker Hughes

Afterward, we visited the Terminal de Imbetiba, Petrobras' offshore base in Macaé. Daniel de Souza Perret and his team explained to us the immense scale of Brazilian oil production, which includes some 40 drilling rigs off the coast of Macaé alone, located about 150 kilometers out at sea.

Figure 8. Petrobras Offshore Port Macaé

On March 12, 2026, we began our return journey to Rio de Janeiro. Despite the heavy cloud cover upon our arrival, we still had time for a walk on the beach and to buy our last souvenir. We rounded out the evening with a visit to a beachside restaurant, where we enjoyed a delicious meal while watching a performance by samba dancers, before ending the day at the famous night market on Copacabana Beach.

Due to a sudden change in the weather on March 13, we unfortunately had to cancel our original plans, so we visited the city's impressive aquarium instead. This offered a fascinating alternative for getting to know the region's marine wildlife. We spent the morning hours of the following day soaking up the last rays of sunshine on the beach before heading to the airport around noon and beginning our journey home to Germany. This marked the end of a highly enriching excursion, both professionally and culturally, that provided us with valuable insights into the international oil and gas industry.

Written by: Mohit Sawlani, Edited by: Fidel Lopez

TU Clausthal SPE Student Chapter: A Strong Spring on the European Stage

The past few months have been a strong period for the TU Clausthal SPE Student Chapter. With a runners-up finish at the European PetroBowl Championship on home turf and a 2nd place result in the Master Students category at the East Meets West Student Paper Contest in Krakow, the chapter has shown that its students can compete and succeed on the European stage.

PetroBowl on Home Ground

The SPE PetroBowl Competition is one of the most prestigious events in the petroleum engineering academic calendar, bringing together teams from universities across Europe and beyond to test their technical knowledge of the oil and gas industry. In April 2026, TU Clausthal had the honor of hosting the SPE European PetroBowl Regional Championship as part of the Student Technical Congress (STC26). For the TU Clausthal SPE Student Chapter, it was not just an organizational milestone but also a chance to compete in front of a home crowd.

Figure 1. SPE TU Clausthal Team in front of the Institute of Subsurface Energy Systems

The TU Clausthal team – **Mohit Sawlani**, **Morhaf Khoule**, **Dennis Opoku Sarkodie Mends**, and **Ahmed Alsherif** – had been preparing for months. Evenings and weekends at the Institute of Subsurface Energy Systems were spent working through material across drilling, reservoir engineering, production operations, petroleum economics, geomechanics, energy law, and more. Regular mock quiz rounds helped turn this broad technical base into fast, competition-ready knowledge.

Figure 2. The Team in Action

A key part of this preparation was the guidance of team coach **Fidel Lopez**. His strategic approach helped the team structure their study sessions, focus on likely question areas, and build the confidence needed to perform under pressure. Backed by faculty, former PetroBowl participants, and the wider SPE community at TU Clausthal, the team went into STC26 aiming to prove that the hosts could also be serious contenders.

PetroBowl Day brought together 16 teams from across Europe, including AGH University of Krakow, IFP School, the University of Zagreb, the University of Stavanger, Democritus University of Thrace, Robert Gordon University, Politecnico di Torino, RWTH Aachen, and others. Match by match, TU Clausthal combined quick reflexes with solid technical depth, advancing steadily through the bracket and earning respect from their peers.

A tightly fought semifinal against the University of Zagreb saw TU Clausthal secure a place in the final, a moment of real pride with friends, colleagues, and professors watching from the audience. In the final, they faced Robert Gordon University, a highly experienced opponent. The match remained close, with both sides trading points across a range of technical topics, but in the end Robert Gordon University took the title, leaving TU Clausthal as European runners-up.

The Award Ceremony that evening closed STC26 on a high note. Receiving the runners-up certificate on stage was a tangible recognition of the team's hard work and the best PetroBowl finish in the chapter's history so far. Beyond the result itself, the experience underlined the importance of teamwork, resilience, and staying calm under pressure – qualities that will stay with the team members as they move into their professional careers.

Figure 3. The team receiving the runners-up Certificate of Award

A Podium in Krakow

Just a few weeks later, in early May, the chapter was back on the road – this time to Krakow for the 14th East Meets West Congress, hosted by the AGH University of Krakow SPE Student Chapter and supported by the SPE Poland Section. From May 5 to 7, the congress gathered petroleum engineering students from across Europe for technical sessions, panel discussions, networking, and student competitions.

TU Clausthal sent a four-person delegation: **Mohit Sawlani**, **Ahmed Alsherif**, **Marcela Vargić**, and **Fidel Lopez Gomez**. Fidel represented the chapter in the Student Paper Contest (SPC) in the Master Students category, while the others took part in the wider programme, using the congress to learn, network, and build connections with students and industry representatives.

Figure 4. Delegation at AGH Krakow

The first day began with registration, the Opening Ceremony, and a keynote, followed by partner technical presentations and a panel discussion on careers in the energy transition under the title "Where Ideas Ignite Energy: Building a Career in a Net-Zero World." Running alongside the main programme, a Career Opportunities Session gave students the chance to speak directly with people from industry. The day closed with an Icebreaker at Browar Górniczo-Hutniczy, a working brewery on the AGH campus, which provided a relaxed setting to put faces to names before the competition started in earnest.

Wednesday focused on the Student Paper Contest. Across multiple sessions, students presented their work to a panel of judges from academia and industry. Fidel competed in the Master Students category, where the assessment went beyond the written paper to include clarity of presentation, the ability to answer questions on the spot, and how convincingly candidates

could explain the impact of their research. The field was strong, but the preparation put in over the year paid off. Fidel kept the audience engaged and handled the Q&A with confidence.

At the Award and Closing Ceremony in the afternoon, Fidel's name was announced as the 2nd place winner in the Master Students category. It was a proud moment for the whole TU Clausthal group and a clear sign of the level of work being done at the Institute of Subsurface Energy Systems. The evening Gala Dinner, held on a floating venue on the Vistula River at the foot of Wawel Royal Castle, offered a fitting setting to celebrate the result and reflect on a full two days of congress activity.

Figure 5. Fidel Lopez receiving the 2nd Place certificate at the Award Ceremony

The final day took the group to Bóbrka, home to the Museum of Oil and Gas Industry Ignacy Łukasiewicz and one of the world's first oil wells, drilled in 1854. Walking through the historic site provided a different kind of perspective – connecting the origins of the industry with the modern technical and energy-transition discussions that had filled the congress halls.

Looking Ahead

Taken together, the PetroBowl runners-up finish in April and the 2nd place in the East Meets West Student Paper Contest in May mark one of the strongest stretches in recent years for the TU Clausthal SPE Student Chapter. They showcase both the quick thinking and teamwork needed in PetroBowl and the research depth and communication skills required for a top-level paper contest.

These achievements are also the result of a broader support system: professors and mentors at TU Clausthal, the SPE German Section, former participants who shared experience and materials, and the organizing teams at STC26 and East Meets West. Their support helped turn preparation into podium finishes.

Looking ahead, the goal is to build on this momentum. For PetroBowl, that means recruiting and training new team members, expanding study resources, and aiming to bring the European title to Clausthal-Zellerfeld. For future paper contests and congresses, it means encouraging more students to present their work, engage with the international SPE community, and use these platforms to grow both technically and personally.

Written By: Akib Ahmed and Md Roman Shaikh, RWTH Aachen University

RWTH Aachen at the 20th SPE Student Technical Congress

Figure 1. RWTH team for SPE STC 2026 at TU Clausthal

Technical Excellence and the PetroBowl Thrill by Md Roman Shaikh

The atmosphere at the PetroBowl was electrifying for me as a participant. Students are tested on everything from industrial history to reservoir engineering in this quick quiz. It was a pleasure to represent RWTH Aachen; the "hot-seat" pressure is unlike anything you would encounter in a classroom! It was a great way to connect with teams from different universities and put our expertise to the test.

Figure 2. Participating in Petrobowl Competition

Final Thoughts

We came away from TU Clausthal with a reinvigorated feeling of purpose in addition to notebooks full of data. The next generation of engineers is prepared to take the lead, whether it is through maximizing CO_2 mineralization in basalt or producing geothermal lithium.

Poster Presentation and received 2nd best poster Award by Akib Ahmed

I'm grateful and very proud to have received 2nd Place for Best Poster.

Working on natural hydrogen has been an exciting experience, and sharing that work with the SPE community was a highlight of the event.

Figure 3. Akib Ahmed, receiving the award for 2nd best poster

Final Thoughts

STC 2026 was more than a technical meeting. It offered real conversations, honest curiosity, and a strong sense of community across SPE chapters. For me, it was a memorable experience: presenting my research, meeting new colleagues, supporting our PetroBowl team, and celebrating students' work across Europe.

I'm grateful to SPE Germany, TU Clausthal University, the organizing committee, sponsors, judges, volunteers, and every student who took part.

Written by: Reinel Echavez , YP member

Inspiring the Next Generation: Highlights from the Young Professionals Panel at STC 2026

Figure 1. Young Professional Panelists

As part of the Student Technical Congress (STC 2026) at Technische Universität Clausthal, the Young Professionals Board of SPE Germany organized an engaging and inspiring Young Professionals Panel, bringing together students, industry experts, and early-career professionals for an open and meaningful discussion about the future of the energy sector.

Hosted in the Aula Academica and moderated by **Mistura Yusuf**, the panel featured **Schirin Yasmin Walter**, **Renas Ibragim**, **Bettina Jenei**, and **Niklas Romanowski**. Representing diverse backgrounds across human resources, academia, operating companies, and service providers, the panelists shared valuable insights from their professional journeys and offered practical advice to students preparing to enter the industry.

The session created a dynamic and interactive atmosphere where participants were encouraged to ask questions, exchange perspectives, and reflect on the opportunities and challenges facing the next generation of professionals. Discussions covered a wide range of topics, including work–life balance, career development, navigating early-career challenges, and the rapidly evolving energy landscape.

A key message throughout the panel was the importance of mentorship, professional networking, and continuous learning in building a successful and sustainable career.

The event also highlighted the role of organizations such as SPE Germany in fostering connections between students and industry professionals.

The organizers expressed their sincere appreciation to everyone who contributed to the success of the event. Special thanks were extended to **Mistura Yusuf**, **Niklas Romanowski**, and **Reinel Echavez** for their dedication and coordination on behalf of the SPE Germany Young Professionals Board, as well as to the panelists for generously sharing theirexperiences and perspectives. Gratitude was also conveyed to the STC 2026 organizing team.

Figure 2. Niklas Romanowski, Mistura Yusuf and Reinel Echavez

Through initiatives such as this panel, SPE Germany continues to demonstrate its commitment to supporting emerging talent and strengthening the professional community within the energy sector. The organization looks forward to continuing this engagement and creating further opportunities for dialogue and collaboration throughout 2026.

Written by: Lukas Ochmann, Membership Chair

SPE Germany Membership Survey 2026 – Results and Outlook

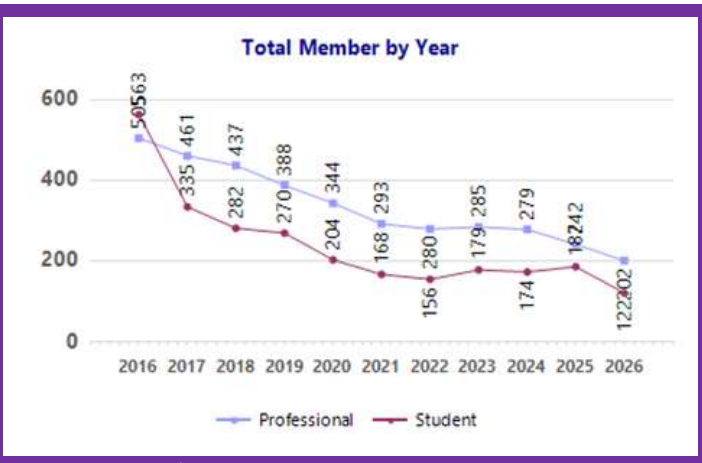


Figure 1. Total Members by year

To further strengthen engagement with its members and shape future activities, we conducted a membership survey between March and May.

SPE continues to follow its global mission of connecting energy professionals and fostering knowledge exchange. In Germany, this is reflected in a wide range of activities, from technical lectures and webinars to networking events and major initiatives such as the Student Technical Congress. These efforts are entirely volunteer-driven and supported by industry contributions. However, like many sections across Europe, SPE Germany has seen a gradual decline in membership, currently standing at 202 professional members and 122 student members.

Key Survey Findings

A total of 42 members (about 12% of the membership base) participated in the survey. While the results mainly reflect views of already engaged members, they provide valuable insights.

The survey clearly highlights two core expectations:

- Knowledge sharing and technical exchange remain the primary driver for participation.
- Networking opportunities are almost equally important to members.

At the same time, the main barriers to higher participation were identified as: Lack of time, event locations being inconvenient and in some cases, limited relevance of topics.

A strong regional preference was observed, with most members favoring events in Hannover and Hamburg.

Event Preferences and Participation

The responses show that members appreciate a balance between different event types, combining flexibility with opportunities for in-person interaction.

Most attended formats include: webinars and online events, in-person technical presentations and established formats such as the Annual BBQ and Student Technical Congress.

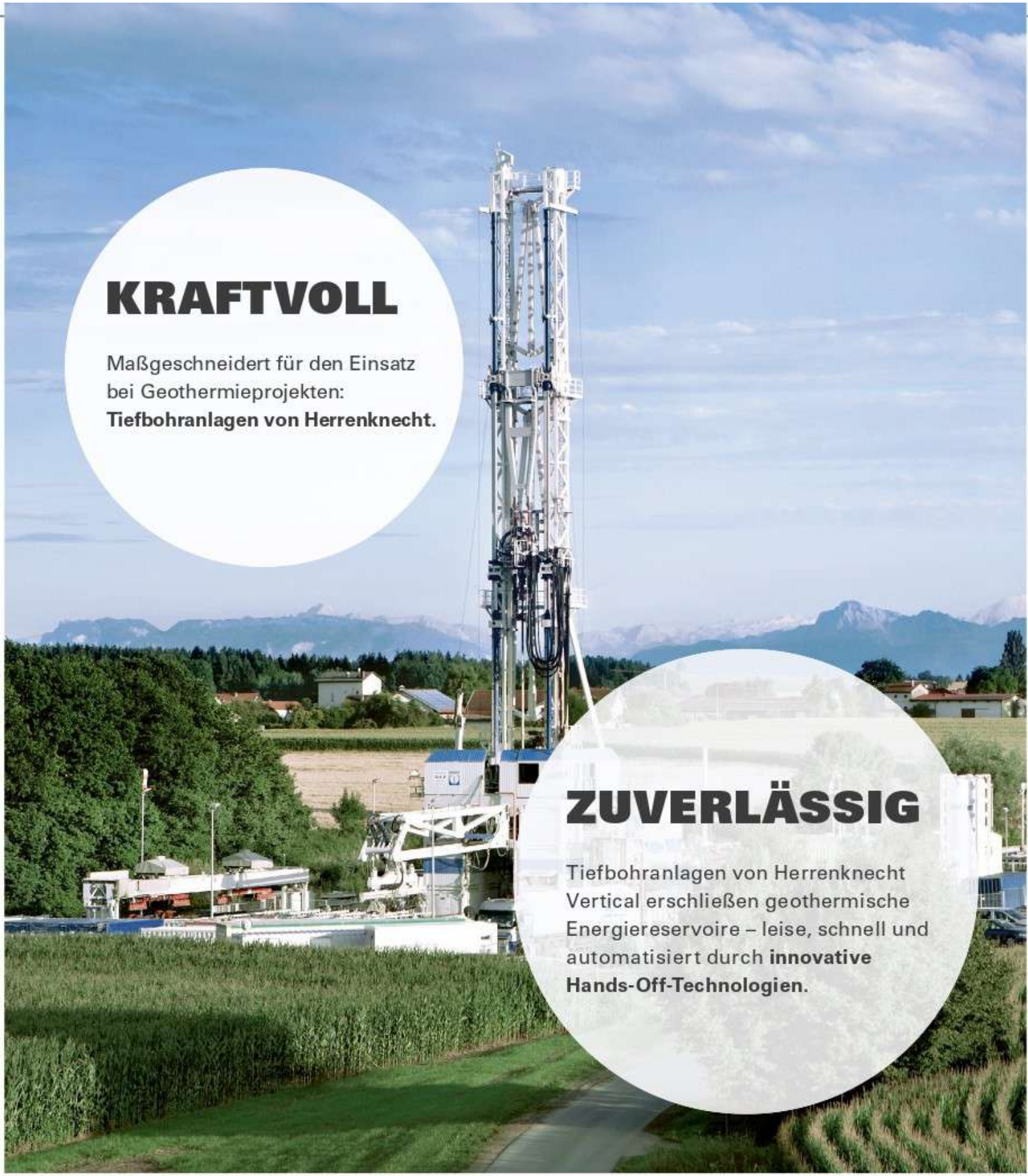
Looking ahead, members expressed interest in more structured and interactive formats such as workshops and conferences.

Topics of Interest

SPE Germany members have diverse technical interests, with no single topic dominating. Instead, several areas attracted attention:

- Oil and gas production and mature field challenges
- Geothermal energy and energy transition topics
- Drilling technologies
- Hydrogen storage

Emerging topics such as CCUS and decommissioning also generated interest, though to a lesser extent.



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