

Deliverable D2.5
**GeoWell mid-term conference
in September 2017**

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GeoWell mid-term conference in September 2017

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Prepared for GeoWell

Short report

ÍSOR-17096

Project no.: 15-0235


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Executive summary

The topic of this report is to describe the preparations and implementation of the GeoWell mid-term conference. An agreement was made with the industry association GeoEnergy Celle e.V. about joining their Celle Drilling 2017 conference, which was held in Celle, Germany, 11–12 September 2017. This is an annual conference where some of the topics are highly relevant for GeoWell, e.g. well integrity, construction, completion and abandonment of wells.

The GeoWell mid-term conference was organized as a full day separate session of the Celle Drilling 2017 conference on the second conference day, 12 September 2017. In total, 9 presentations were given, covering all technical work packages of GeoWell in 6 of the presentations.

An Advisory Panel of three experts was established in connection with the conference to review the results and give advice to the consortium. They attended the GeoWell session and participated actively with valuable inputs to discussions between the session participants on the GeoWell project.

In general, the GeoWell mid-term conference was successful. The attendance was very good. In addition to the 15–20 attendees from the GeoWell consortium, the session attracted at least a similar number of other participants of the Celle Drilling conference. Thus, the total number of attendees was in the range 30–50 people most of the time. Abstracts and presentations (slides) were requested from those speakers who were willing to make them accessible through a web address announced to the conference participants.

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1 Introduction

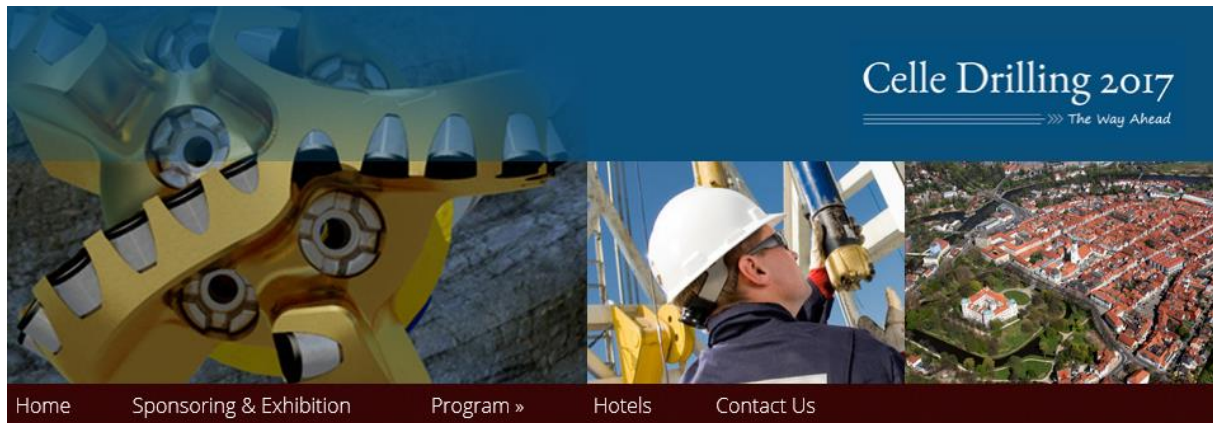
As described in the GeoWell Grant Agreement, two conferences are planned within the project during the project period, a mid-term conference and a final conference. The goal is to disseminate project results outside the consortium and to get feedback. The conferences are open for the public but selected groups within the geothermal industry and other relevant sectors will be specially invited to attend the conferences. The topic of this report is to describe the preparations and organization of the mid-term conference.

2 GeoWell mid-term conference

2.1 Preparations

Preparations of the mid-term conference were discussed at a GeoWell project meeting in Paris in February 2017, where different options regarding dates and location were discussed. At an early stage, it was clear that it would not be possible to organize the conference before the end of month 18 (July), which was the due date of the corresponding deliverable, D2.5, according to the Grant Agreement. The project officer accepted that the conference would be held 1–2 months later and by that probably attract more people to attend. From the beginning, the aim was to organize the conference as a joint event with some other related activity, mainly to be able to reach out to a wider audience.

Intensive work on preparations of the conference started in April 2017 by investigating the possibilities of joining some event within other geothermal H2020 projects or similar activities. None of these projects turned out to be planning an event that looked promising in the time period that suited GeoWell. Instead, we contacted the organizers of the annual Celle Drilling conference that is held in Celle, Germany, with a request about joining their event. This year the conference was held on 11–12 September 2017. The conference home page on the web is shown in Figure 1. (<https://www.celle-drilling.com/2017/index.php>). The organizers expressed strong interest in cooperation with GeoWell. The Celle conference is organized by the industry association GeoEnergy Celle e.V. (<http://en.preview.geoenergy-celle.de>), which aims to promote technologies, standards, and infrastructures for the efficient accessibility and use of oil, natural gas, and geothermal energy, as well as supporting new applications and markets, particularly in the field of renewable energy sources. Several of the conference topics announced for Celle Drilling 2017 are highly relevant for GeoWell, e.g. well integrity, construction, completion and abandonment of wells. The GeoWell Executive Board appointed Pierre Durst, Thomas Reinsch and Árni Ragnarsson as members of a working group to prepare the mid-term conference and agreed to start negotiations with GeoEnergy Celle e.V. about joining their Celle Drilling 2017 conference.



Celle Drilling 2017

The Way Ahead - Gearing Up for Recovery

International Conference and Exhibition for Advanced Drilling Technology

11-12 September 2017 at Congress Union, Celle, Germany

Under the theme “**Gearing Up for Recovery**” professionals from academia and industry will discuss the future of drilling technology, with a special emphasis on land drilling applications. The main topics of the conference are:

- Drilling Process Optimization
- Drilling Equipment and Automation
- Drilling Applications and Case Studies
- Well Integrity, Construction, Completion and Abandonment
- Data, Modeling, Validation and Simulation
- Geothermal Operations
- Brownfields: Reentry and Workover
- Requirements for Recovery: Permitting, Environment, People

Additional Sessions: Project GeoWell – Innovative materials and designs for long-life high-temperature geothermal wells, funded by the EU Program Horizon 2020

Celle Drilling 2017 provides a focused platform for the international exchange on these subjects and related topics.

Celle Drilling 2017 invites interested professionals from business and science to contribute papers, to discuss and present new technologies, and to meet peers at the conference and exhibition.

Congress takes place at

Congress Union Celle
Thaerpl. 1, 29221 Celle

Gold Sponsor



Silver Sponsor



Sponsor



Figure 1. Celle Drilling 2017 website, accessed in August 2017.

2.2 Organization of the conference

Negotiations with Celle Drilling 2017 resulted in an agreement on organizing the GeoWell mid-term conference as a full day separate session of the Celle Drilling 2017 conference on the second conference day, 12 September 2017. According to the contract that was signed between the partners, GeoEnergy Celle e.V obliged to provide the following services:

- Presentation room within the Congress Union Celle for 50–70 attendees.
- Room for a meeting of the GeoWell consortium on Monday morning, 15–20 attendees.
- Necessary technical equipment for presentations.
- Drinks (water) in the presentation room.
- One hostess for services in the presentation room.
- Publication of the programme of the GeoWell sessions and the GeoWell project logo on the Celle Drilling Website and in the printed conference brochure.
- Conference material for promotion and signs for the GeoWell sessions.
- Project management for preparation and organisation the GeoWell participation in “Celle Drilling 2017”.

GeoWell obliged to deliver the following:

- Keynote speech of 30 minutes, introducing the GeoWell research and innovation project on Monday 11 September.
- Lecture session with 10 presentations on Tuesday 12 September, starting at 8:30 and ending at 15:00, including networking breaks and lunch break.

Also, GeoWell accepted to promote and advertise the Celle Drilling conference within their project network and to interested professionals. GeoWell paid a conference contribution to the organiser amounting to 3,650 € plus 19% tax, in total 4,343.50 €. In addition, the project covered the conference fee for two Advisory Panel members amounting to in total 678.30 €.

Costs for travel, accommodation and conference fees for individual participants were paid by the partners themselves directly and not included in the conference contribution that GeoWell paid jointly to Celle Drilling. The conference fee was in the range of 240–390 € per person, different for speakers and non-speakers as well as for people from universities/authorities and people from the industry. The fee included coffee, drinks, lunch and conference dinner.

The GeoWell session of the Celle Drilling conference (GeoWell mid-term conference) was widely announced. In addition to the Celle Drilling 2017 website, it was announced on the GeoWell website and in the project Newsletter No 2. Also, an announcement was sent to all geothermal H2020 projects for distribution to their contact network.

The Celle Drilling 2017 conference started after lunch on 11 September. The GeoWell consortium used the opportunity to have a project meeting in the morning of that day from 9:00 to 12:00 to discuss and clarify internal issues related to the work ahead and strengthen the collaboration between the WPs.

The program of the GeoWell session is shown in Figure 2. The session started at 8:30 in the morning of Tuesday 12 September and finished about 15:00. In total 9 presentations were given, covering all technical work packages of GeoWell in 6 presentation. In addition, presentations were given on the H2020 DESCRAMBLE project, drilling of the IDDP-2 well in Iceland and the newly established Well Integrity Platform (WIP). The GeoWell session was attended by up to about 50 people, of that between 15 and 20 from the GeoWell consortium.

About 240 people attended the Celle Drilling 2017 conference. The program of the whole conference is given in the Appendix.

Celler Saal: GeoWell Part 1	
08:30 - 09:00	Chemical and Microstructural Alterations of Annular Cements of a High-Temperature Geothermal Well Penny Pipilikaki, TNO - Netherlands Organisation for Applied Scientific Research
09:00 - 09:30	High-Temperature Composite Casings Emile Lautier, Akiet
09:30 - 10:00	Flexible Coupling of Casings Gunnar Skúlason Kaldal, ÍSOR - Iceland GeoSurvey
10:00 - 10:30	Properties and Selection of Casing Materials Ingólfur Thorbjörnsson, ÍSOR - Iceland GeoSurvey
Celler Saal: GeoWell Part 2	
11:00 - 11:30	Integrity Monitoring of High Temperature Geothermal Wells Using Fibre Optic Distributed Sensing Techniques Martin Lipus, GFZ German Research Centre for Geosciences
11:30 - 12:00	Development of a Framework for Well Integrity Risk Assessment of Geothermal Wells Mohammad Mansouri Majoumerd, IRIS - International Research Institute of Stavanger
12:00 - 12:30	First Result of DESCRAMBLE Project: Evidences for Existence of Deep Supercritical Fluid? Massimo Luchini, EGP - Enel Green Power
Celler Saal: GeoWell Part 3	
13:30 - 14:00	Brief over view of the Icelandic deep drilling RN-15/IDDP-2 at Reykjanes, Iceland Ómar Sigurdsson, HS Orka
14:00 - 14:30	Well Integrity Platform Kris Ravi, Kris-Ravi Consultancy LLC
14:30 - 15:00	Discussion between the session participants on the GeoWell project

Figure 2. Program of the special GeoWell session at the Celle Drilling 2017 conference.

2.3 Advisory Panel

According to the GeoWell Grant Agreement, an Advisory Panel is to be established around conferences organized by the project to review the results and give advice to the consortium. The following three persons accepted to be members of the Advisory Panel for the GeoWell mid-term conference in Celle:

Dr. Kris Ravi

Kris-Ravi Consultancy LLC, USA

Dr. Michael Prohaska

University of Leoben, Austria

Frank B. Springett

National Oilwell Varco, USA

GeoWell covered the conference registration fee for the two Advisory Panel members that attended specially for the GeoWell session. All three covered their own travel expenses.

To prepare the members of the Advisory Panel a teleconference was organized between them and the working group that organized the GeoWell session. The members of the Advisory Panel also received documentation about the content of the GeoWell project. In addition, they received an e-mail with the following text that was intended to explain what the consortium expected from their contribution:

“Our general goal with the Advisory Panel is to get feedback from you. We would like to learn from you what you think about the project idea, the way it is executed, the strengths and weaknesses of our approach. We would also like to hear your suggestions on what we could do better or in addition to what we have done so far and what we plan to do. In particular, how can we make sure our results are received and acknowledged by the interested public? After the meeting, we would appreciate a summary of your thoughts in written form, with comments on what you liked and where you see room for improvement, and ideally with recommendations on how to proceed and how to make sure stakeholders know about our results”.

The last presentation in the GeoWell session was given by one of the Advisory Panel members, Dr. Kris Ravi. He talked about a newly established Well Integrity Platform (WIP). It is an international platform for members who need solutions or who can offer solutions for well integrity challenges.

The last 45 minutes of the session were reserved for a general discussion between the session participants on the GeoWell project. It was a fruitful discussion where all members of the Advisory Panel, among others, participated strongly in the discussion with valuable inputs.



Figure 3. *Participants in the GeoWell session at the Celle Drilling 2017 conference.*

3 Concluding remarks

In general, the GeoWell mid-term conference was successful, in terms of both substance and participation. The attendance to the Celle session was better than the organizers had expected. In addition to the 15–20 attendees from the GeoWell consortium, the session attracted at least a similar number of other participants of the Celle Drilling conference. Thus, the total number of attendees was in the range 30 to 50 people most of the time. Making the mid-term conference an integrated part of a bigger event was for sure very important for the attendance.

Submission of conference papers was not requested from the presenters at the conference. However, abstracts and presentations (slides) were requested from those speakers who were willing to make them accessible through a web address announced to the conference participants. Thus, all GeoWell presenters submitted either their abstract or presentation (or both) for publication on this website.

Appendix:
Program of the Celle Drilling 2017

Monday, 11 September

Großer Saal

- | | |
|---------------|--|
| 11:30 - 13:00 | Registration |
| 13:00 - 13:10 | Welcome
<i>Thor Noevig, Chairman GeoEnergy Celle e.V.</i> |
| 13:10 - 13:30 | Program Introduction / Conference Overview
<i>Prof. Dr.-Ing. Joachim Oppelt</i> |
| 13:30 - 14:00 | Keynote Talk
Inventing Smarter Ways to Bring Energy to the World
<i>Tom Thissen, Baker Hughes, a GE company</i> |
| 14:00 - 14:30 | Keynote Talk
Big Data... Big Whoop! Is Better the Enemy of Good Enough?
<i>Frank Springett, National Oilwell Varco</i> |
| 14:30 - 15:00 | Keynote Talk
Innovative Design and Operation of High-Temperature Geothermal Wells
<i>Ingólfur Thorbjörnsson, ÍSOR - Iceland GeoSurvey Project Consortium GeoWell</i> |
| 15:00 - 15:30 | Coffee Break & Networking |

Großer Saal: Session 1 "Drilling Equipment and Technology"

- | | |
|---------------|---|
| 15:30 - 16:00 | New Laboratory Test Setup Enables Testing of Full Scale BHAs with Respect to Torsional Field Loads
<i>Dennis Heinisch, Baker Hughes, a GE company</i> |
| 16:00 - 16:30 | Field Test of Simultaneous Gyro Attitude Reference for Magnetic Ranging Measurements in a Near Vertical Magnetically Perturbed Environment
<i>Georgy Rassadkin, Scientific Drilling International</i> |
| 16:30 - 17:00 | Composite Drill Pipe for Superior Performance
<i>Jaromir Ufer, Voith Composites GmbH & Co. KG</i> |
| 17:00 - 17:30 | Optimised Hybrid Drill Bit Technology Matched to Application Yields Breakthrough in Drilling Performance
<i>Waleed Agawani, Baker Hughes, a GE company</i> |
| | (ePoster) Condition Monitoring
<i>Vincent von Melle, Zeppelin Power Systems GmbH & Co. KG</i> |

- | | |
|---------------|--------------------------------------|
| 17:30 - 18:30 | Coffee Break & Networking |
| 18:30 | Conference Evening |

Tuesday, 12 September

07:30 - 08:30 **Registration, Coffee & Networking**

Großer Saal: Session 2
"Drilling Optimization and Dynamics I"

08:30 - 09:00 **Field Test Result with a Stick-Slip Reduction Tool**

Steve Jones, Sanvean Technologies / Scout Downhole

09:00 - 09:30 **3D Directional Trajectory Prediction Using Coupled Bit and BHA models: Theory and Field Case Studies**

Will Attridge, Baker Hughes, a GE company

09:30 - 10:00 **Case Study: Methods for Automated Drilling Performance Analysis Based on Downhole Measurements**

Hamza Sellami, Leibniz Universität Hannover Institute of Dynamics and Vibration Research (IDS)

10:00 - 10:30 **Advanced Dynamics FEA Modelling as a New Approach for Geothermal Drilling Optimization in Indonesia**

Yoan Mardiana, Schlumberger

Europa Saal: Session 3
"Drilling Fluids and Borehole Hydraulics"

Simulation Of Steady State Cuttings Transport In Inclined And Horizontal Wells

Yaroslav Ignatenko, Baker Hughes

An Insight Into the New IWCF Level 5 Curriculum

Ivo Nijhuis, The Well Academy BV

Flow-Loop Experiments With Non-Newtonian Reference Fluids for Estimating Uncertainty of In-Line Rheology Sensors

Fionn Iversen, IRIS - International Research Institute of Stavanger

Drilling Fluids and Borehole Hydraulics

James Mansell, Clear Solutions International Ltd

(ePoster) Sepiolite Base Mud Challenges Harsh Drilling Conditions

Ali Ettehad, Izmir Katip Celebi University

10:30 - 11:00 **Coffee Break, Networking & ePosters**

Großer Saal: Session 4
"Drilling Optimization and Dynamics II"

11:00 - 11:30 **Drilling Systems Design and Operation Management: Leveraging the Value of Advanced Data-Driven Analytics**

Opeyemi Bello, TU Clausthal - Institute of Petroleum Engineering

11:30 - 12:00 **Enhancing Post-Run Drilling Optimization with Data Analytics and High-Speed Drilling Dynamics Measurements**

Pedro Arevalo, Baker Hughes, a GE company

12:00 - 12:30 **Mathematical Modelling of Axial Vibration on Tri-Cone Bits for Maximum ROP and Optimum RPM**

Arash Asgharzadeh, TU Clausthal - Institute of Petroleum Engineering

(ePoster) Prediction of Bit and Reamer Loads for Increased Reliability of Hole-Opening BHAs

Armin Kueck, Baker Hughes, a GE company

Europa Saal: Session 5
"Cementing, Well Integrity, Geomechanics"

Class G Cement – A Universal Remedy?

Oliver Czuprat, DEA Deutsche Erdoel AG

Initial Integrity Evaluation of Storage and Production Wells

Thomas Brückner, Deep Underground Engineering

Innovative Casing Drilling Technology Improved The Ability to Set The Casing Deeper Through The Problematic Zone in Indonesia Geothermal Operation

Bonar Noviasta, Schlumberger

(ePoster) Surface Deformation Study for a Geothermal Operation Field

Julia Diessl, GeoMechanics Technologies

Tuesday, 12 September

12:30 - 13:30 **Lunch Break, Networking & ePosters**

**Großer Saal: Session 6
"Drilling Simulation and Automation"**

13:30 - 14:00 **Web Enabled High Fidelity Drilling Computer Model with User-Friendly Interface for Education, Research and Innovation.**
Robert Ewald, IRIS - International Research Institute of Stavanger

14:00 - 14:30 **Miniature Robotic Drilling Rig for Research, Technology Development and Education.**
Astrid Lescoeur, Martin Aagaard Olsen, Mayuran Vasantharajan, Norwegian University of Science and Technology

14:30 - 15:00 **Construction of an Autonomous Laboratory Scale-Drilling Rig for Testing and Control of Drilling Systems**
Erik Løken, University of Stavanger

15:00 - 15:30 **Networking Break, Exhibition & ePosters**

15:30 - 17:00 **Visit of Drilling Simulator Celle Research Institute**
(only for registered participants)

17:00 **End of Conference**

**Europa Saal: Session 7
"Hammer Drilling "**

New Developments for Hard Rock Drilling - From Hydraulic DTH Hammer to Laser Drilling
Volker Wittig, International Geothermal Centre - GZB

The Water Hammer Effect in Hammer Drilling
Marc Spinneker, TU Clausthal - Institute of Petroleum Engineering

HAMMR Drilling Motor Improves Efficiency
Gunther von Gynz-Rekowski, ASHMIC LC

Visit of Drilling Simulator Celle Research Institute

Drilling Simulator Celle (DSC) is a new and unique research lab that uses virtual (software) and real (hardware) devices to help oilfield clients to understand and mitigate critical drilling and well construction scenarios. The Virtual Simulator is based on an industry-leading training simulator that has been enabled to allow modifying the software, in order to describe especially downhole events in an optimized way. The hardware simulator basically consists of a horizontal full scale flow loop, powered up by two oil-field triplex pumps with 800 HP each. The system allows drilling with a BHA up to 6 ¾" into a formation and investigate the dynamic behavior of components and cuttings transportation. Both industry and research customers are welcome to have their equipment tested in the software and hardware environment.

Shuttle services from the conference building to the DSC will available. Special registration is required because of limited seats available.

Tuesday, 12 September

The members of the project group "GeoWell" will present their mit-term results of the research and innovation project "Innovative materials and designs for long-life high-temperature geothermal wells". The project is funded under the European Union's Horizon 2020 research and innovation programme.

Celler Saal:
GeoWell Part 1

- 08:30 - 09:00 **Chemical and Microstructural Alterations of Annular Cements of a High-Temperature Geothermal Well**
Penny Pipilikaki, TNO - Netherlands Organisation for Applied Scientific Research
- 09:00 - 09:30 **High-Temperature Composite Casings**
Emile Lautier, Akiet
- 09:30 - 10:00 **Flexible Coupling of Casings**
Gunnar Skúlason Kaldal, ÍSOR - Iceland GeoSurvey
- 10:00 - 10:30 **Properties and Selection of Casing Materials**
Ingólfur Thorbjörnsson, ÍSOR - Iceland GeoSurvey
- 10:30 - 11:00 **Coffee Break & Networking**

Celler Saal:
GeoWell Part 2

- 11:00 - 11:30 **Integrity Monitoring of High Temperature Geothermal Wells Using Fibre Optic Distributed Sensing Techniques**
Martin Lipus, GFZ German Research Centre for Geosciences
- 11:30 - 12:00 **Development of a Framework for Well Integrity Risk Assessment of Geothermal Wells**
Mohammad Mansouri Majoumerd, IRIS - International Research Institute of Stavanger
- 12:00 - 12:30 **First Result of DESCRAMBLE Project: Evidences for Existence of Deep Supercritical Fluid?**
Massimo Luchini, EGP - Enel Green Power
- 12:30 - 13:30 **Lunch Break & Networking**

Celler Saal:
GeoWell Part 3

- 13:30 - 14:00 **Brief over view of the Icelandic deep drilling RN-15/IDDP-2 at Reykjanes, Iceland**
Ómar Sigurdsson, HS Orka
- 14:00 - 14:30 **Well Integrity Platform**
Kris Ravi, Kris-Ravi Consultancy LLC
- 14:30 - 15:00 **Discussion between the session participants on the GeoWell project**