

GEOPHYSICS IN GEOTHERMAL ENERGY – TODAY AND TOMORROW

12–14 OCTOBER 2021



PROGRAMME

KUALA LUMPUR TIME
(GMT + 8:00)

Committee

- STEPHEN HALLINAN, CGG - CO-CHAIR
 AQUARDI RACHMAT SUMINAR, STAR ENERGY - CO-CHAIR
 IMAM RAHARJO, PERTAMINA GEOTHERMAL ENERGY - CO-CHAIR
 ALISON KIRKBY, GEOSCIENCE AUSTRALIA
 AMINE OURABAH, STRYDE FURTHER
 AWAL MANDONG, CGG
 CHRIS NELSON, STAR ENERGY
 DODDY ASTRA, SARULLA OPERATIONS LTD
 EUGENE SUNIO, PHILIPPINE GEOTHERMAL PRODUCTION COMPANY, INC.
 GREG USSHER, JACOBS ENGINEERING JONATHAN LEE MONASTERIAL, ENERGY DEVELOPMENT CORPORATION
 KHAIRUL ARIFIN MOHD NOH, UNIVERSITI TEKNOLOGI PETRONAS
 MARINO BAROEK, SUPREME ENERGY
 MOHD HARIRI ARIFIN, UNIVERSITY KEBANGSAAN MALAYSIA
 SARVAGYA PARASHAR, HALLIBURTON
 MS IYER, HALLIBURTON
 ROBERT HUNN, FORTESCUE
 STEVEN SEWELL, ORMAT
 TOSHIHIRO UCHIDA, GEOLOGICAL SURVEY OF JAPAN (GSJ)

SPONSORS

PLATINUM SPONSOR



BRONZE SPONSORS



PT. TUNGGAL BUANA UTAMA



PHILIPPINE GEOTHERMAL

SPONSORED WEBINAR

SESSION SPONSOR



SPEED NETWORKING SPONSOR DAY 1



DAY 1 : CURRENT PRACTICES

14:00- 14:10 **Welcome:** Technical Committee Co-Chairs
 14:10 - 14:20 **Leadership Keynote Address:** SEG Board
 14:20 - 14:50 **Opening Speaker:** Ahmad Yuniarto, Pertamina Geothermal Energy

| STREAM 1 | STREAM 2 |
|---|--|
| 14:50 – 15:10 25 Years of imaging the geothermal “clay cap” Progress and remaining challenges Greg Ussher, Jacobs | 14:50 – 15:10 Current practices in geophysics used for geothermal exploration and monitoring in Iceland Gylfi Páll Hersir, Iceland GeoSurvey (ISOR) |
| 15:10 – 15:30 A critical view on the MT technology for geothermal exploration: Success story, pitfalls and lesson learned for future applications Yunus Daud, Universitas Indonesia | 15:10 – 15:30 Magnetotellurics (MT) in Geothermal Exploration: Overview of Current Practice and Perspective within Indonesian Context Hendra Grandis, Institut Teknologi Bandung (ITB) |
| 15:30 – 15:50 Shared experienced of geophysical exploration in Indonesia Geothermal prospects (+/- 35 years experience) and application of conceptual model William Cumming, Cumming Geoscience | 15:30 – 15:50 Magnetotellurics and Geothermal Systems: the Importance of Scale Jared Peacock, United States Geological Survey |
| 15:50 – 16:30 Moderated Discussion Streams 1 & 2 | 16:30 – 16:50 NETWORKING BREAK |

TUESDAY, 12 OCTOBER 2021

All sessions are in Kuala Lumpur Time (GMT +8:00)

| STREAM 3 | STREAM 4 |
|--|--|
| 16:50 – 17:10 Current practices in geophysics for geothermal resource exploration and monitoring Ted Bertrand, GNS Science | 16:50 – 17:10 3D magnetotelluric inversion by finite-difference modeling including topography in Hakkoda geothermal area, northern Japan Toshi Uchida, Independant |
| 17:10 – 17:30 Current Practices in Geophysics for Geothermal Resource Exploration and Monitoring Riki Infan, Independent | 17:10 – 17:30 Geothermal Geophysics at the Sorik Marapi and Sokoria Fields, Indonesia Gabe Matson, Geologica Geothermal Group |
| 17:30 – 17:50 Use of geophysics for exploration, development and operations in the high temperature Rotokawa, Ngatamariki and Kawerau geothermal fields of New Zealand Steven Sewell, Australis Geoscience Ltd | 17:30 – 17:50 3D MT Characterization the Northern Part of Patuha Geothermal Field Anif Darmawan, PT Geo Dipa Energy |
| 17:50 – 18:20 Moderated Discussion Streams 3 & 4 | 18:20 – 18:40 Breakout Session with Speakers 1-4 |

DAY 2 : CURRENT PRACTICES & LATEST TECHNOLOGY

14:00- 14:20 **Opening Speaker:** CGG

| STREAM 1 | STREAM 2 |
|---|---|
| 14:20 – 14:40 Magnetotelluric Data and Resistivity Interpretation of Wayang Windu Geothermal Field, Indonesia Rifqa Wicaksono, Star Energy Geothermal | 14:20 – 14:40 Tectonic of Minahasa District: An Update from Local Tomposo Geothermal Field Data Muhammad Ikhwani, Pertamina Geothermal Energy |
| 14:40 – 15:00 Gravity Data Reveals the Structural Play of Geothermal System: Case Study of Muara Laboh Geothermal Field, Indonesia Irvan Ramadhan, Supreme Energy | 14:40 – 15:00 Four-dimensional Seismic Tomography to Detect Temporal Velocity Changes within Geothermal Reservoir in Sumatra, Indonesia: A Preliminary Study Aditya Abdurrahman Juanda, Pertamina Geothermal Energy |
| 15:00 – 15:20 Euler Deconvolution Application in Tomposo Geothermal Field Fadhilaz Digdaya Haq, Pertamina Geothermal Energy | 15:00 – 15:20 Adjusted Mesh in Inverse Modelling of Timelapse Microgravity in Geothermal Area Mochamad Tofan Sastranegara, Pertamina Geothermal Energy |
| 15:20 – 15:50 Moderated Discussion Streams 1 & 2 | 15:50 – 16:10 Networking Break |
| | 16:10 – 16:30 Keynote Speaker: Priyandaru Effendi, Indonesia Geothermal Association |

WEDNESDAY, 13 OCTOBER 2021

All sessions are in Kuala Lumpur Time (GMT +8:00)

| STREAM 3 | STREAM 4 |
|--|--|
| 16:30 – 16:50 Time-lapse Precision Gravity for Reservoir Dry-out Monitoring in Darajat Geothermal Field, West Java. Reka Tanuwidjaja, Star Energy Geothermal | 16:30 – 16:50 3D joint inversion of geothermal geophysics; towards geologically-consistent results Wolfgang Soyer, CGG |
| 16:50- 17:10 Reservoir Base Redefinition using Improved Microseismic Events from Tomography Study at Salak Field, Indonesia Muhamad Wildan Perdana, Star Energy Geothermal | 16:50- 17:10 Diffraction Imaging using Microseismic Record Obtained by DAS Moeto Fujisawa, JGI Inc |
| 17:10 – 17:45 Moderated Discussion Streams 3 & 4 | 17:45 – 18:05 Breakout Session with Speakers 1-4 |

DAY 3 : EMERGING TECHNOLOGIES & GEOPHYSICS FOR THE WIDER GEOTHERMAL CONTEXT

14:00- 14:20 **Opening Speaker:** Ken Riedel, Star Energy Geothermal

| STREAM 1 | STREAM 2 |
|--|--|
| 14:20 – 14:40 The value of geophysical data for geothermal exploration: examples from empirical, field & synthetic data Whitney Trainor-Guitton, W Team Geosolutions | 14:20 – 14:40 Mapping subsurface heat with surface conductive heat flow sensors Graeme Beardsmore, University of Melbourne |
| 14:40 – 15:00 Multi-channel data modelling scheme for imaging with uncertainty the clay cap, temperature distribution and heat output in high temperature geothermal field Alberto Ardid, University of Canterbury | 14:40 – 15:00 Miniaturization of seismic equipment enabling better seismic for geothermal exploration Amine Ourabah, STRYDE |
| 15:00 – 15:20 Unlocking geothermal reservoir seismic characterization with physics-guided deep neural networks Jean-Luc Formento, CGG | 15:00 – 15:20 High Resolution 3D seismic image for geothermal by jointly designing acquisition and imaging Nicolas Salaun, CGG |
| 15:20 – 15:50 Moderated Discussion Streams 1 & 2 | 15:50 – 16:10 NETWORKING BREAK |

THURSDAY, 14 OCTOBER 2021

All sessions are in Kuala Lumpur Time (GMT +8:00)

| STREAM 3 | STREAM 4 |
|--|---|
| 16:10 – 16:30 Implementation of an Induced Seismicity Protocol for the United Downs Deep Geothermal Power Project, United Kingdom Andrew Jupe, Altcom Limited | 16:10 – 16:30 Implementation of an Induced Seismicity Protocol for the United Downs Deep Geothermal Power Project, United Kingdom Andrew Jupe, Altcom Limited |
| 16:30 – 16:50 Integrated geophysical exploration of low-enthalpy geothermal resources - with a focus on Thailand Helmut Duerrast, Prince of Songkla University | 16:30 – 16:50 The use of satellite InSAR across Geothermal Complexes to monitor surface deformation indicative of fluid dynamics Amy Lloyd, CGG |
| 16:50 – 17:10 Detection of geothermal system below Chotanagpur granitic gneissic complex using audio magnetotelluric method in the Bakreswar geothermal province, Eastern India. Rajib Kumar Sinharay, Maharashtra Institute of Technology | 16:50 – 17:10 Low-temperature geothermal reservoir mapping and characterization in the NE Netherlands Sumit Verma, University of Texas |
| 17:10 – 17:45 Moderated Discussion Streams 3 & 4 | 17:45 – 18:05 Breakout Session with Speakers 1-4 |