

EAGE



AAPG



FIRST EAGE/AAPG/SEG CARBON CAPTURE UTILISATION AND STORAGE WORKSHOP (CCUS)

UNLOCKING THE POTENTIAL OF CARBON STORAGE:
STRATEGIES FOR A SUSTAINABLE FUTURE

21-23 OCTOBER 2025 | AL KHOBAR | SAUDI ARABIA

PROGRAMME

PLATINUM SPONSOR

aramco



WWW.EAGE.ORG

TECHNICAL COMMITTEE

Mario H Valderrama (Co-Chair)	Aramco
Alejandro Rodriguez (Co-Chair)	ADNOC
Raymond Jellema	ADNOC
Federico Games	Ad Terra
Ahmed Alghamdi	Aramco
Nicolas Foote	Badley Ashton
Carlos Granado	Computer Modelling Group Limited
Ali Alfaraj	DGS
Jonathan Pye	DNV
Syrie Crouch	Independent Consultant
Mohammad Haidar	KOC
Naif AlQahtani	NCVC
Alberto Ortiz	Net Zero Carbon Solutions
Ahmed Sabry	SLB
Wael Abdallah	SLB
Oskar Vidal Royo	Terractiva
Kim Senger	The University Centre in Svalbard
Laurent Fontanelli	UniLaSalle
Liao Kunpeng	Viridien

WORKSHOP OVERVIEW

CCS/CCUS technologies have emerged as critical solutions for mitigating greenhouse gas emissions, particularly in the rapidly industrializing and urbanizing Middle East region. Both the subsurface technical knowledge and related data sets of the petroleum industry are major inputs required for the world to successfully move towards a carbon-neutral and sustainable energy future. The Middle East with its exceptional petroleum systems and wealth of subsurface knowledge is a prime candidate to lead the CCS efforts worldwide.

The goals of the workshop are to promote knowledge sharing on the latest capture, transport and storage advances from renowned experts and industry professionals, focus on subsurface workflows for CCS evaluation through technical presentations, accelerate further consideration of the application of mainstream CCS technologies in the Middle East region, and exchange ideas and issues around CCS technology. The workshop will also shed light on CCUS-focused climate action strategies along with CCUS economic and business models with a view on Carbon market opportunities, to exchange valuable and actionable insights, the First EAGE/ AAPG/ SEG Carbon Capture Utilisation and Storage Workshop (CCUS) will bring together the expertise from subsurface specialists including geologists, geophysicists, geochemists, well design and operations, reservoir engineers, project managers, and petrophysicists, as well as research and academia.



WORKSHOP TOPICS

1. CCS/CCUS in the Context of the Middle East

- The role of the Middle East in global CCS initiatives
- Leveraging petroleum industry expertise for CCS development
- The Middle East's geological suitability for CO₂ storage
- Challenges and opportunities for CCS in rapidly urbanizing regions
- International Standards in the Middle East context: ISO and others

2. Subsurface Workflows for CCS Evaluation Reservoir and overburden characterization for CO₂ storage

- The role of core in characterizing a CCS storage complex
- Changes in Rock Properties Due to CO₂ Injection
- Specific data collection for CCS project: shallow logs, water elemental analysis...
- Modeling and simulation of CO₂ injection and storage: from wellhead
- Lessons from EOR (Enhanced Oil Recovery) for CCS
- Role of seismic imaging in evaluating CCS reservoirs
- Dynamic Reservoir Behavior and Long-Term Storage Feasibility
- Geochemistry & Geomechanics workflows
- Interaction between reservoirs and seals

3. Machine Learning/AI for Subsurface / Production for CCS

- Automated baseline data utilization for natural events discrimination
- MMV data feed to digital twin for Automated/assisted Asset Performance and optimization
- MMV data feed for Automated/assisted carbon credits and LCA certification

4. Deployment of CCS Technologies in the Middle East

- Current CCS projects and pilot studies in the region
- Regulatory frameworks and policies for CCS deployment
- Role of national oil companies (NOCs) in advancing CCS
- Public-private partnerships for CCS projects
- Lessons from global CCS projects?



5. Plume migration and Leakage Monitoring for CCS

- Baseline recording: biosphere, atmosphere, hydrosphere, passive seismic and ground elevation – technology selection and strategies
- EM, Seismic, Spot seismic and other imaging techniques
- Monitoring and verification techniques for secure storage
- Detecting CCS induced micro-seismicity
- Full chain Risk Register as input to MMV program

6. Multidisciplinary Collaboration in CCS Projects

- Cross-industry knowledge sharing for successful CCS deployment
- Bridging the gap between academia, research, and industry in CCS: pilots and experimental data
- Contributions of geologists, geophysicists, geochemists, well geomechanics, and petrophysicists, and Well & reservoir engineers in CCS

7. Challenges and Solutions in CCS Deployment

- Addressing technical, financial, and operational challenges
- CO2 product specifications: full chain integrity vs capture cost
- Compositional assurance and metering
- Subsurface implications of the impurity of the CO2 stream
- Building infrastructure to support large-scale CCS operations

8. Future Directions for CCS in the Middle East

- CO2 import: shipping
- Geological Challenges in Multi-Zone Storage Systems
- Emerging trends and research in CCS technologies
- Scaling up CCS to meet global climate goals
- Opportunities for innovation and investment in CCS
- Risks of evolving regulations to CCS projects
- Economics and financing of CCS projects
- Long term liabilities sharing mitigation

Keynote Speakers



Hanan Balalaa

Senior Vice President, New Energies & CCUS
ADNOC



Almohannad Alghamdi

EXPEC CO2 Champion
Aramco

Keynote Title: Carbon Capture, Utilization & Sequestration (CCUS): From R&D to field deployment



Dr. Mohammad Abu Zahra

Head of MENA Region
Global CCS Institute

Keynote Title: MEA Region CCUS Status, Potential and Opportunities



Chiara Cavalleri

Reservoir Performance Petrophysics Domain
Champion
SLB

Keynote Title: The Critical Role of Subsurface Formation Evaluation in CCUS: Technology Application and Case Studies



PANEL DISCUSSIONS

Panel 1: Advances and Challenges in Carbon Storage Exploration

Tuesday, 21 October 2025 | 11:00AM - 12:00PM (UTC+3)

Moderator



Suhail Diaz Valderrama

Director Future Energies Middle East-Eastern Hemisphere
Wood

Panelists



Mostafa Ahmed

Manager, Carbon Storage Exploration Division
Aramco



Marylena Garcia

Managing Senior Vice President- Head of Sustainable Energy Division
Ryder Scott



Amir Hermes

New Energy Business Development Manager
SLB

Panel 2: Challenges and Solutions in CCS Deployment

Wednesday, 22 October 2025 | 12:40PM - 13:40PM (UTC+3)

Moderator



Georges Badawi

Senior Director - Energy Transition
S&P Global

Panelists



Steve Hollingworth

Carbon Storage Integration Manager
Viridien



Mohammed H Shawaf

Supervisor Carbon Capture & Sequestration (CCS)
Aramco



Joel Flitton

Head of Commercial MENA/APAC/SAM
Director Carbon Removals
Capturi

TECHNICAL PROGRAMME

Oral Presentations | Tuesday, 21 October

SULTANA BALLROOM (PART 1&2)	
07:30	Registration & Welcome Coffee
08:15	HSSE From Hotel
08:20	Opening Remarks by Co-Chairs Alejandro Rodriguez (ADNOC) & Mario H Valderrama (Aramco)
08:30	Opening Address by Dr. Aiman Bakhorji (Aramco)
08:45	Management Overview - Hanan Balalaa (ADNOC)
Session 1 - CCS/CCUS in the Context of the Middle East Session Chairs: Raymond Jellema (ADNOC) & Wael Abdallah (SLB)	
09:15	Keynote 1 - MEA Region CCUS Status, Potential and Opportunities - Dr. Mohammad Abu Zahra (Global CCS Institute)
09:45	Interactions of Iron and Associated Minerals with CO₂ in Paleozoic Sandstones of Saudi Arabia - C. Munoz Martinez ^{1*} , A. Al-Yaseri ¹ , H. Al-Mukainah ² , K. Al-Ramadan ¹ ¹ Geosciences Department, College of Petroleum Engineering and Geosciences, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia; ² Center for Integrative Petroleum Research (CIPR), College of Petroleum Engineering and Geosciences, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia.
10:05	Achieving Net Zero Carbon Emissions through CCUS in West Kuwait Fields - M. Alzamanan ^{1,2*} ¹ Kuwait Oil Company; ² D&M
10:25	Morning Coffee Break
Panel Session 1 - Advances and Challenges in Carbon Storage Exploration Moderator: Suhail Diaz Valderrama, Wood	
11:00	Panelists: • Marylena Garcia, Ryder Scott • Mostafa Ahmed, Aramco • Amir Hermes, SLB
11:50	Audience Q&A
12:00	Lunch Break - Horizon Restaurant
Session 2 - Subsurface Workflows for CCS Evaluation Reservoir and Overburden Characterization for CO₂ Storage Part 1 Session Chairs: Carlos Granado (CMG) & Raymond Jellema (ADNOC)	
13:00	Keynote 2 - Carbon Capture, Utilization & Sequestration (CCUS): From R&D to Field Deployment - Almohannad Alghamdi (Aramco)
13:30	Digital Integration in CCS: A Game-Changing Pilot in the Middle East Region - S. Diaz ¹ , J. Henriksson ¹ , A. Rodriguez ² , H. Haghighi ^{1*} , R. Jellema ² , M. Aneke ¹ , L. Calderon ² ¹ Wood; ² ADNOC
13:50	Lessons Learned from Brazilian Technical Evolution: CO₂ WAG EOR that has Delivered 50Mt of CO₂ Storage - P. Gusmão ^{1*} , E. Mackay ² ¹ Petrobras; ² Heriot-Watt University
14:10	CCS Challenges in Heterogeneous Carbonates: Identification and Characterization of Microporosity Facies as Barriers for CO₂ Injectivity - R. Jordan Leite ^{1*} , Y.E. Jing ¹ , H.M. Jubran ¹ , P.T. Madeira Pinto ¹ ¹ Saudi Aramco
14:30	De-risking Geochemical/Mechanical Impacts of the Injection and Storage of Impure CO₂ in a Carbonate Reservoir - R. Van Noort ^{1*} , A. Rodriguez-Martinez ² ¹ IFE Institute for Energy Technology; ² ADNOC

Poster Session 1

14:50	Lightning Session - Presenters introducing their posters Reactive Transport Simulation of CO₂ Injection Effects on the Hith Caprock Integrity - A Preliminary Analysis. - M. Maigana ^{1*} , A. Alshuhail ¹ ¹ King Fahd University of Petroleum and Minerals Geomechanical Characterization of Montney Turbidites for Secondary Carbon Storage in the Western Canada Sedimentary Basin - A. Mascarenhas ¹ , E. Muniz ^{2*} ¹ University Of Toronto; ² SLB
15:00	Poster Presentations at the Coffee Break Area
Session 3 - Deployment of CCS Technologies in the Middle East Session Chairs: Wael Abdallah (SLB) & Kunpeng Liao (Viridien)	
15:30	Challenges of Mid-Stream Operators in CCUS Value Chain - R. Gopinath ^{1*} , V.M. Kapuria ¹ ¹ ADNOC
15:50	Automated CO₂ Detection by Focused Seismic Monitoring using Optical Fiber DAS-VSP Data - J. Mari ¹ , H. Al Khatib ¹ , J.A. Cowell ² , G. Cambois ² , O.H. Kirstetter ² , J. Mason ² , C. Cosson ^{1*} ¹ SpotLight; ² ADNOC
16:10	Closing Remarks by Chairs
16:20	End of Day 1

Oral Presentations | Wednesday, 22 October

SULTANA BALLROOM (PART 1&2)

07:30	Registration & Welcome Coffee
08:00	Welcome by Co-Chairs Alejandro Rodriguez (ADNOC) & Mario H Valderrama (Aramco)
Session 4 - Subsurface Workflows for CCS Evaluation Reservoir and Overburden Characterization for CO₂ Storage Part 2 Session Chairs: Laurent Fontanelli (UniLaSalle) & Ahmed Sabry (SLB)	
08:10	Keynote 3 - The Critical Role of Subsurface Formation Evaluation in CCUS: Technology Application and Case Studies - Chiara Cavalleri (SLB)
08:40	Aquifer Size, Seal Strength Effects on CO₂ Storage Capacity, a Case Study in the Middle East - M. Valderrama ^{1*} , A. Ghamdi ¹ ¹ Aramco
09:00	Advanced 4D Seismic Quantification of a Saline Aquifer Carbon Storage: Insights from Sleipner, Norway - E. Omonigho ^{1*} ¹ ADNOC HQ, Upstream Directorate
09:20	Thermo-Mechanical Coupled Modeling to Assess CO₂ Storage Integrity in a Depleted Gas Reservoir - J. Guerra ^{1*} ¹ SLB
Poster Session 2	
09:40	Lightning Session - Presenters introducing their posters Advanced Mineralization of CO₂ in Basaltic formations: Implication for CO₂ storage - J. Mouallem ^{1*} , M. Arif ¹ , M. Mahmoud ² , A. Raza ² ¹ Khalifa University; ² King Fahd University of Petroleum and Minerals The importance of water characterization for CCUS - M. Charupa ^{1*} , A. Ali ¹ ¹ SLB
09:50	Poster Presentations at the Coffee Break Area

Oral Presentations | Wednesday, 22 October

Session 5 - Challenges and Solutions in CCS Deployment	
Session Chairs: Syrie Crouch (Independent) & Ahmed Al Teneiji (ADNOC)	
10:20	Subsurface Constraints for CO2 Specifications in Geological CCS: A Focus on the Middle East - V. Yarushina ^{1*} , Y. Podladchikov ² , L. Khakimova ² , I.M. Ismail ³ , T. Koksalan ³ ¹ Institute for Energy Technology; ² University of Lausanne; ³ ADNOC
10:40	An Efficient CCS Development Strategy that Optimizes Costs whilst Decreasing Subsurface Uncertainty - P. Zapico ^{1*} , A. Clark ¹ , R. Jordan Leite ¹ , D. Shaukry ¹ ¹ Saudi Aramco
11:00	Pertamina's CCS Hub Development in Indonesia: Driving Net Zero and Regional Carbon Storage Leadership - D. Ardiyanta ^{1*} , D. Mersitarini ¹ , A. Widowati ¹ , I. Mahendra ¹ , A.F. Farabi ¹ , M.A. Fauzi ¹ ¹ PT. Pertamina (Persero)
11:20	Assessment of CO2 Specifications - When are they Safe? - A. Dugstad ^{1*} , B. Morland ¹ , G. Svenningsen ¹ , A. Raju ² , W. Al Shouly ² , I. Ismail ² , A. Rodriguez Martinez ² ¹ Institute For Energy Technology; ² ADNOC
11:40	Lunch Break - Horizon Restaurant
Panel Session 2 - Challenges and Solutions in CCS Deployment	
Moderator: Georges Badawi (S&P Global)	
12:40	Panelists: • Mohammed H Shawaf, Aramco • Steve Hollingworth, Viridien • Joel Flitton, Capturi • Pavan Chilukuri, Energex
13:30	Audience Q&A
Session 6 - Plume Migration and Leakage Monitoring for CCS	
Session Chairs: Kunpeng Liao (Viridien) & Ahmed S. Ghamdi (Aramco)	
13:40	The Impact of Depositional Environment on the Fate of CO2 Plume: Case Study from Saudi Arabia - J. Zhou ^{1*} , S. Egbeni, A. Ghamdi, H. Daif ¹ Saudi Aramco
14:00	CCS Monitoring Using Time-Lapse Walkaway VSP in the West of China - G. Yu ¹ , J. Huang ¹ , Y. Wang ¹ , Y. Chen ¹ , K. Du ^{1*} ¹ BGP Inc. CNPC
14:20	A Real-time, Cost-effect and Integrated MMV Solution for Real-time and Continuous Carbon Storage Monitoring - M. Hedefa [*] , T. Chen ¹ Arabian Geophysical and Surveying Co. (ARGAS); ² SensorEra Inc
14:50	Afternoon Coffee Break
15:10	Tracer-based MMV Technology – Qualification and Results from One Year of Monitoring of Middle-East Storage Project - S.K. Hartvig ^{1*} , T.I. Aarhus ¹ , Ø. Dugstad ¹ , J.A. Cowell ² , J. Mason ² ¹ RESMAN Energy technology; ² ADNOC Upstream
15:30	Cross-well Imaging for Monitoring CO2 Plumes at Svelvik CO2 Field Lab - Y. Yang ^{1*} , D. Urozayev ² , N. Barbosa ² , A. Ghaderi ² , O.M. Saad ¹ , T. Alkhalifah ¹ ¹ King Abdullah University of Science and Technology; ² SINTEF Industry
15:50	Closing Remarks by Chairs
16:00	End of Day 2

Oral Presentations | Thursday, 23 October

BALLROOM (PART 1&2)	
07:30	Registration & Welcome Coffee
08:00	Welcome by Co-Chairs Alejandro Rodriguez (ADNOC) & Mario H Valderrama (Aramco)
Session 7 - Subsurface Workflows for CCS Evaluation Reservoir and Overburden Characterization for CO2 Storage Part 3	
Session Chairs: Ahmed Sabry (SLB) & Syrie Crouch (Independent Consultant)	
08:10	MATLAB Carbon Sequestration Model: Simulating Vertical Equilibrium for CO2 Storage in Geological Formations - A. Yaseri ¹ , F. Pol ^{1*} , C. Wells ² , K. Andreas ³ ¹ CES - MATLAB in the Middle East; ² MathWorks; ³ SINTEF
08:30	Chalk as a Strategic CO2 Storage Medium: Experimental Insights into Reactivity and Flow Dynamics - W. Al-Masri ^{1*} , B. Rostami ¹ , K. Blinkenberg ¹ , S. Johansson ² , U. Kakemem ² , S. Mohammadkhani ¹ , P. Frykman ¹ , K. Anderskouv ² , H. Petersen ¹ ¹ Geological Survey of Denmark and Greenland; ² University of Copenhagen
08:50	Enhancing Data Acquisition to Improve Static Modeling of Carbon Sinks - Z. Alabdulmohsen ^{1*} , E. Elsherif ¹ Saudi Aramco
09:10	Thermal Dynamic Simulation for modelling Carbon Dioxide Storage in Depleted Gas Reservoirs - Workflow and Advantages - A.R. Shah ¹ , C. Golaco ² , V. Stashevsky ^{1*} , C. Rat ¹ , H. Hasan ¹ , M. Povstyanova ¹ , M. Shaykhatarov ¹ , M. Robert ² , J. Guerra ¹ , M. Shady ¹ , A. Bentaher ² ¹ SLB; ² SNOC
Poster Session 3	
09:30	Lightning Session - Presenters introducing their posters
	Physicochemical interactions between Carbonates/Brine/CO2 and their impact on Residual Trapping: Application for CO2 geo-storage - J. Mouallem ^{1*} , M. Arif ¹ , M. Mahmoud ² , A. Raza ² ¹ Khalifa University; ² King Fahd University of Petroleum and Minerals
	Managing Multi-Disciplinary Risks Across the CCS Value Chain: Integrating Surface and Subsurface Assurance - M. Garcia ^{1*} , R. Jellema ² ¹ Ryder Scott; ² ADNOC
09:40	Poster Presentations at the Coffee Break Area
Session 7 Con't - Subsurface Workflows for CCS Evaluation Reservoir and Overburden Characterization for CO2 Storage Part 4	
Session Chairs: Nicolas Foote (Badley Ashton) & Wael Abdallah (SLB)	
10:20	CCS Plume Dynamics History Matching and Uncertainty Assessment through Integrated Numerical Simulation and 4D Seismic Interpretation - R. Solatpour ^{1*} , G. Oliveria ¹ , F. Yatte ¹ , A. Alvarez ¹ , S. Fernandes ² ¹ CMG; ² Bluware
10:40	Rock Permeability Effect on Residual CO2 Trapping Efficiency in Carbonate Formations - J. Mouallem ^{1*} , M. Arif ¹ , M. Mahmoud ² , A. Raza ² ¹ Khalifa University; ² King Fahd University of Petroleum and Minerals
11:00	Assessing the Potential of Open Saline Aquifer for Carbon Storage in Kuwait - M. Al-Awadhi ^{1*} , M. Huuse ² , C. Hollis ² ¹ Kuwait Oil Company / University of Manchester; ² University of Manchester
11:20	Subsurface Characterization of Sandy Reservoirs for CO2 Sequestration - F.O. Escosa ¹ , O. Vidal ^{1*} , A. Amilibia ¹ ¹ Terractiva Consulting
11:40	Using Play-based Exploration to High Grade Areas for CO2 Storage - R. Siddiqui ^{1*} , J. Ismail ¹ ¹ Saudi Aramco
12:00	Lunch Break - Horizon Restaurant

Oral Presentations | Thursday, 23 October

Session 7 Con't - Subsurface Workflows for CCS Evaluation Reservoir and Overburden Characterization for CO₂ Storage Part 5

Session Chair: TBC & Raymond Jellema (ADNOC)

13:00	Independent Third Party Integrated Multi-disciplinary CCUS Characterization and Evaluations - R. Decesari ^{1*} , M. Garcia ¹ ¹ Ryder Scott Company
13:20	A Multidisciplinary Subsurface Evaluation of the CO₂ Sequestration Potential and Risks Associated with Rift Basin Settings - A. Clark ^{1*} , P. Zapico Palmero ¹ , J. Cherdasa ¹ , J. Fedorik ¹ ¹ Saudi Aramco
13:40	Afternoon Coffee Break
14:10	Dissolved CO₂ Storage: A Novel Solution for CCS in the Red Sea Rift Basins - J. Ye ^{1*} , P. Lu ¹ , J. Almeida De Carvalho ¹ , W. Wei ² ¹ Saudi Aramco; ² Aramco Asia
14:30	A Subsurface Scenario Modelling Approach for Evaluating CO₂ Storage Potential in Saline Aquifers - N. Din ^{1*} , H. Daif ¹ , M. Valderrama ¹ , M. Bakri ¹ ¹ Aramco
14:50	Discussion Session
15:20	Closing Remarks by Co-Chairs
15:35	End of Workshop

VENUE

voco® Al Khobar

Dhahran Road, Al-Thuqbah, King Abdullah Street,
Al Khobar 31952, Saudi Arabia

SPONSORS

Platinum Sponsor



Lanyard Sponsor



Registration Sponsor



Company Display



SPONSORSHIP

To view the full range of sponsorship opportunities available at the event, please get in touch at corporaterelations@eage.org.



CONTACT

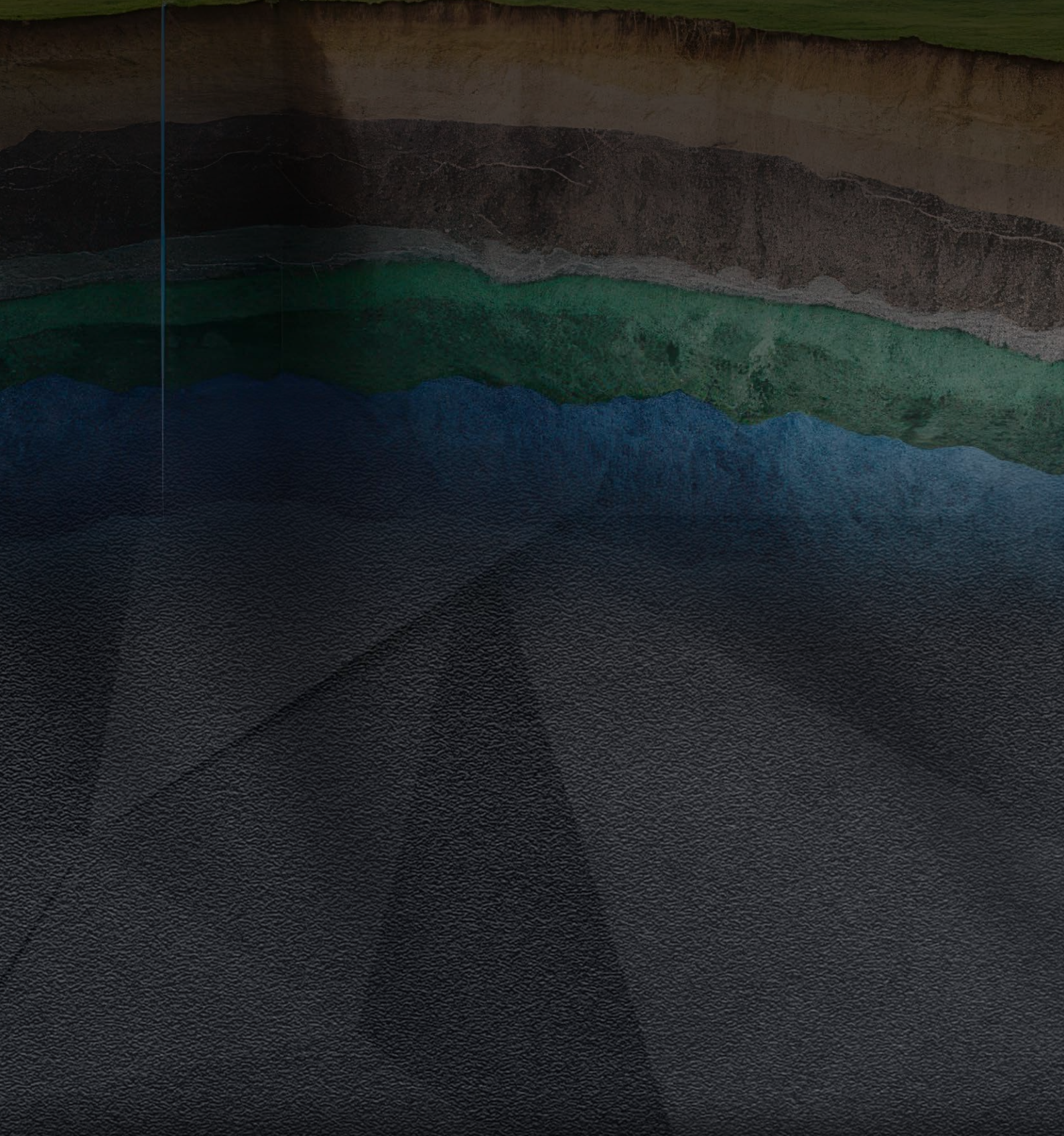
For more information on the workshop, please get in touch with the EAGE MEA team via middle_east@eage.org or +971 4 369 3897.

REGISTRATION



Registration Fees: Workshop Only

Regular Delegate	Rate (USD)
Member	1650
Non-Member	1850
Committee Member/ Presenter	1450
Academia	900
Student Delegate	Rate (USD)
Student Member	550
Student Non-Member	650



EUROPE OFFICE
+31 88 995 5055
EAGE@EAGE.ORG

MIDDLE EAST/AFRICA OFFICE
+971 4 369 3897
MIDDLE_EAST@EAGE.ORG

ASIA PACIFIC OFFICE
+60 3 272 201 40
ASIAPACIFIC@EAGE.ORG

AMERICAS OFFICE
+57 310 8610709
AMERICAS@EAGE.ORG

HEAD OFFICE | KOSTERIJLAND 48 | 3981 AJ BUNNIK | THE NETHERLANDS | +31 88 995 5055 | EAGE@EAGE.ORG

     **JOIN US ON SOCIAL MEDIA!**

WWW.EAGE.ORG | WWW.AAPG.ORG | WWW.SEG.ORG