# ASIA PACIFIC UNCONVENTIONAL®

## RESOURCES TECHNOLOGY CONFERENCE

FUELED BY SPE • AAPG • SEG

**16—18 November 2021 | Virtual**

**CONFERENCE PROGRAMME**

Sponsoring Organisations

SPE International — Society of Petroleum Engineers

AAPG — Advancing the World of Petroleum Geosciences™

SEG — Society of Exploration Geophysicists

go.spe.org/21APURC

# Message from the Programme Co-Chairs

Dear Colleagues,

Welcome to the second edition of the **Asia Pacific Unconventional Resources Technology Conference (Asia Pacific URTeC)**, **16-18 November 2021**.

A joint effort between the Society of Petroleum Engineers (SPE), the American Association of Petroleum Geologists (AAPG) and the Society of Exploration Geophysicists (SEG), the Asia Pacific URTeC gathers regional and global professionals, regulators and prominent researchers to share their technical know-how and technology advancements. With the theme **"Unconventional Resources as a Pathway to a Sustainable Energy Future"**, the conference will provide us with new perspectives in evaluating and optimising unconventional resources extraction.

The industry has witnessed an increase in activity directed at the shale gas and tight gas resource potential throughout the Asia Pacific region. For example, Australia has large unconventional tight gas and is currently exporting large volumes of coalbed methane as LNG from Queensland and exploring Proterozoic shale resources in the Northern Territory. Both these areas have significant impact for unconventional resources in the Eastern Hemisphere.

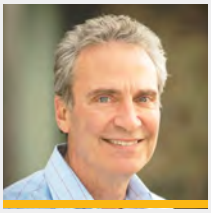
Despite the ongoing uncertainty brought on by the pandemic and volatile market outlook, the industry must continue to explore innovative technological solutions and address challenges for unconventional exploration and development to create new prospects for affordable and sustainable supply.

On behalf of the sponsoring organisations, we thank you for your support and participation. We wish all participants a productive conference.

Sincerely,
Programme Co-Chairs

Simon John Smith
Chief Petroleum Engineer
**Origin Energy**
SPE Co-Chair

Thomas Flottman
Principal Geologist and Chief Geoscientist
**Origin Energy**
AAPG Co-Chair



David J. Campagna
Independent Advisor
**Independent**
SEG Co-Chair

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** This Conference Programme is updated as at 11 November 2021.*

# Committee

## Conference Advisor

Raymond Johnson Jr.
Professor of Well Engineering & Production Technology
School of Chemical Engineering
Energi Simulation Co-Chair, Centre for Natural Gas
**The University of Queensland**

## Technical Programme Co-Chairs

Simon John Smith, SPE
Chief Petroleum Engineer
**Origin Energy**

Thomas Flottman, AAPG
Principal Geologist and Chief Geoscientist
**Origin Energy**

David J. Campagna, SEG
Independent Advisor
**Independent**

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George Koperna
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Hoang Gia Diem
**Vietnam Oil and Gas Group (PetroVietnam)**

Pham Xuan Anh
**Vietnam Oil and Gas Group (PetroVietnam)**

Mohammed Omer
**Weatherford**

# Committee

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**Arrow Energy**

Tim A. Moore
**Cipher Consulting Pty. Ltd.**

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**Denison GAs**

Nathan Parker
**Origin Energy**

Andrew Garnett
**The University of Queensland Centre for Natural Gas**

Ferian Anggara
**Universitas Gajah Mada**

## SEG Committee Members

Darrell Kramer
**DK GeoScience Services**

Julie Shemeta
**MEQ Geo Inc.**

Marcel Croon
**MPC Kinetic**

Siti Normaizan Hassan
**PETRONAS Canada**

Rob Ross
**Qeye**

Dennis Cooke
**ZDAC Geophysical**




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AAPG Advancing the World of Petroleum Geosciences™

SEG SOCIETY OF EXPLORATION GEOPHYSICISTS

## General Sponsors

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THE UNIVERSITY OF QUEENSLAND AUSTRALIA

Sponsored Seminar

# Conference Programme Schedule

| Time (UTC +10) | Stream 1 | Stream 2 |
|---|---|---|
| **Tuesday, 16 November 2021** | | |
| **0900 - 0930 hours** | **Opening and Keynote Session** | |
| **0930 - 1030 hours** | **Executive Plenary Session:** Unconventional Resources as a Pathway to a Sustainable Energy Future | |
| **1030 - 1100 hours** | **Sponsored Seminar 1**<br>Copula Geostatistics - Because "Normal" Isn't Always the Best Choice<br>*The University of Queensland* | |
| **1100 - 1200 hours** | **Panel Session 1**<br>Valuing Unconventionals: The Good, the Bad and the Ugly | **Technical Session 1**<br>Well Construction |
| **1200 - 1300 hours** | Break | |
| **1300 - 1400 hours** | **Technical Session 2**<br>Geomechanics: The Intersection of Geoscience and Engineering | **Technical Session 3**<br>Big Data and Applications of Machine Learning I |
| **1400 - 1430 hours** | Break | |
| **1430 - 1530 hours** | **Technical Session 4**<br>Advances in Hydraulic Fracturing I | **Technical Session 5**<br>Petrophysics/Formation Evaluation |
| **1530 - 1600 hours** | Break | |
| **1600 - 1700 hours** | **Technical Session 6**<br>Production Technology | **Technical Session 7**<br>Unconventional Reservoir Engineering I |
| **Wednesday, 17 November 2021** | | |
| **0900 - 1000 hours** | **Technical Session 8**<br>Case Studies | **Technical Session 9**<br>Big Data and Applications of Machine Learning II |
| **1000 - 1030 hours** | **Sponsored Seminar 2**<br>Nimble Nodes for Future Proof Seismic Surveys<br>*STRYDE Limited* | |
| **1030 - 1130 hours** | **Panel Session 2**<br>The Energy Mix of the Future | **Technical Session 10**<br>Geomechanics of the Wellbore: Rock Properties, Near-Field Stresses, and Stability |
| **1130 - 1300 hours** | Break | |
| **1300 - 1400 hours** | **Technical Session 11**<br>Unconventional Reservoir Engineering II | **Technical Session 12**<br>Geophysics |
| **1400 - 1430 hours** | Break | |
| **1430 - 1530 hours** | **Panel Session 3**<br>Social License to Operate in a World Dominated by Social Media | **Technical Session 13**<br>Hydraulic Fracturing Diagnostics |
| **1530 - 1600 hours** | Break | |
| **1600 - 1700 hours** | **Technical Session 14**<br>Advances in Hydraulic Fracturing II | **Technical Session 15**<br>Reservoir Engineering for Shales: From Permeability to EOR |
| **Thursday, 18 November 2021** | | |
| **0900 - 1000 hours** | **Technical Plenary Session:** Unconventional Resources as a Pathway to a Sustainable Energy Future in Asia Pacific | |
| **1000 - 1030 hours** | Break | |
| **1030 - 1130 hours** | **Panel Session 4**<br>How Good is our Ability in Predicting Future Production? | **Technical Session 16**<br>$CO^2$, the Environment and Social License to Operate |
| **1130 - 1230 hours** | Break | |
| **1230 - 1330 hours** | **Technical Session 17**<br>Innovative Materials and Emerging Technologies as Applied to Unconventionals | |
| **1330 - 1430 hours** | **Closing Session:** Remarks by Programme Co-Chairs | |

# General Information

## Event Hours

Please note that the event is scheduled in Brisbane local time (GMT/UTC +10 time zone).

| Date | Time |
|---|---|
| Tuesday, 16 November | 0900-1700 hours (UTC +10) |
| Wednesday, 17 November | 0900-1700 hours (UTC +10) |
| Thursday, 18 November | 0900-1430 hours (UTC +10) |

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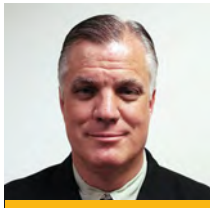
# Opening and Keynote Session

**Tuesday, 16 November 2021** | 0900-0930 hours (UTC +10)

## Opening Address



Tom Blasingame
Professor, Petroleum Engineering
**Texas A&M University**
2021 SPE President

## Keynote Address

The Hon. Scott Stewart
Minister for Resources
**Queensland**

# Executive Plenary Session: Unconventional Resources as a Pathway to a Sustainable Energy Future

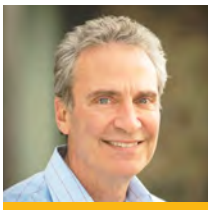
**Tuesday, 16 November 2021** | 0930-1030 hours (UTC +10)

This session will provide a platform for leading executives to engage in stimulating, forward-looking dialogue to shape common responses to critical issues that confront the industry, and to share knowledge and experience on the synergies between unconventional resources and sustainable energy.

## Session Moderators

Simon Smith
Chief Petroleum Engineer
**Origin Energy**

Thomas Flottman
Principal Geologist and
Chief Geoscientist
**Origin Energy**



David J. Campagna
Independent Advisor
**Independent**

## Speakers

Mark Fitzgerald
President and
Chief Executive Officer
**PETRONAS Canada**

Amy Chua
President - Asia
**Schlumberger**

Vello Kuuskraa
President
**Advanced Resources International, Inc.**

# Technical Plenary Session: Unconventional Resources as a Pathway to a Sustainable Energy Future in Asia Pacific

**Thursday, 18 November 2021** | 0900-1000 hours (UTC +10)

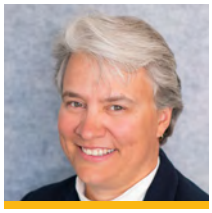
This session will provide an overview of the resources, technology, challenges as well as opportunities, to develop unconventional resources for a sustainable energy future, with a particular emphasis on the Asia Pacific region.

## Session Moderators

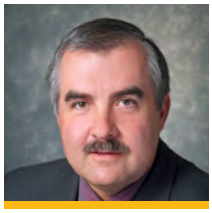
Simon Smith
Chief Petroleum Engineer
**Origin Energy**

Thomas Flottman
Principal Geologist and Chief Geoscientist
**Origin Energy**

## Speakers



Jennifer Miskimins
Professor and Department Head
Petroleum Engineering
**Colorado School of Mines**



John G Hattner
Senior Vice President
**Netherland, Sewell & Associates, Inc.**

David Close
Vice President - Operations and External Affairs
**Tamboran Resources**

Joan Esterle
Emeritus Professor, Earth and Environmental Science
**The University of Queensland**

# Panel Session 1: Valuing Unconventionals: The Good, the Bad and the Ugly

**Tuesday, 16 November 2021** | 1100-1200 hours (UTC +10)

Australian coal seam gas (CSG) plays have successfully matured and consistently delivered LNG worldwide. However, opportunities to further develop additional Australian resources still exist, though primarily in low-permeability coal and shale reservoirs. Throughout the Asia-Pacific region, similar reservoir types will require technologies and strategies common to what are found in Australia and that knowledge will be of value to those future developments. This panel session will discuss both the location and development stage of low permeability reservoirs in the Asia-Pacific region. The key to that is knowing how to determine their value and quantify their level of risk.

Success or failure of low permeability CSG and shale projects are dependent on addressing key technical, project management, political, and community issues relative to each play. The Australian (for CSG) and North American (for shale) experience has shown that unconventional resources cannot be exploited by small incremental projects nor through application of unproven technology. Finally, an objective of this panel session is also to discuss the difficulty in estimating reserves and resources in unconventional plays that may lie within the Asia-Pacific region. Particularly, it will reflect on the pre-2011 PRMS guidelines, the successes and failures of post-2011 PRMS guidelines, and some thoughts on how the 2018 PRMS updates will shape the assessment of future plays including exploring views on the applicability of PRMS to Australian unconventional resources.

## Session Chairs

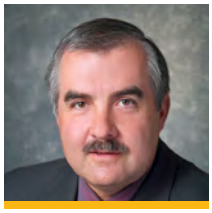
Duncan Lockhart
General Manager
Exploration
**Central Petroleum**

Simon Smith
Chief Petroleum Engineer
**Origin Energy**

Raymond Johnson Jr.
Professor of Well Engineering &
Production Technology,
School of Chemical Engineering,
Energi Simulation Co-Chair,
Centre for Natural Gas
**The University of Queensland**

## Speakers

Barbara Pribyl
**Independent**



John G Hattner
Senior Vice President
**Netherland, Sewell &**
**Associates, Inc.**

Martin Wilkes
Managing Director
**RISC**

# Panel Session 2: The Energy Mix of the Future

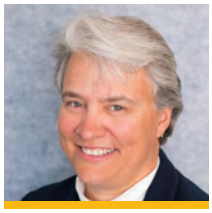
**Wednesday, 17 November 2021** | 1030-1130 hours (UTC +10)

As the world recovers from the global pandemic, it is apparent that life will never quite be the same. These changes also apply to the world of energy, now and into the future. This panel session will focus on the "Energy Mix of the Future". Topics of discussion will include:

- What is the most likely future mix of energy sources and what does "energy mix" really mean?
- Where do hydrocarbons fit in this mix, and can we re-imagine the way unconventional resources are developed to provide a range of energy products (e.g. hydrocarbons, hydrogen, electricity) to better align with the energy mix of the future?
- Unconventional reservoirs have long lives and can the value of current existing assets and the investment cases for new projects be protected in the calls for increasing worldwide decarbonisation?
- The roles renewables will play in the energy mix of the future and can these be aligned with unconventional reservoir developments using the benefits of hybrid systems.

Strategies on how to maintain licenses to operate for future endeavours, while defining reasonable goals and technical targets, will also be discussed.

## Session Chairs



Jennifer Miskimins
Professor and
Department Head
Petroleum Engineering
**Colorado School of Mines**

Nathan Parker
Carbon Capture and Storage
(CCS) Lead
**Origin Energy**

Heinz-Gerd Holl
Senior Research Officer
**The University of Queensland**
**Centre for Natural Gas**

## Speakers

Graeme Beardsmore
Technical Director
**Hot Dry Rocks Pty Ltd**

Tracey Boyes
General Manager,
Future Growth
**Origin Energy**

Andrew Garnett
Director, UQ Centre for
Natural Gas
**The University of Queensland**

# Panel Session 3: Social License to Operate in a World Dominated by Social Media

**Wednesday, 17 November 2021** | 1430-1530 hours (UTC +10)

As the world progresses towards greener and more efficient energy, Social License to Operate (SLO) has become an increasingly heard term, gaining keen interest especially in the context of mining, oil and gas development, and other resource-related industries. Over the years, as it gains prominence from social media, and indigenous and government engagements, the term has generated a lot of attention and is no longer a concept that can be ignored.

In this era dominated by social media, coupled with diminishing conventional resources and the long journey in renewable energy, unconventional resources, once seen as the main source of environmental upset, is becoming the attention of businesses to explore and develop. This topic has gone through an emotional journey of debate and more often than not, the portrayal on horizontal drilling activities and hydraulic fracturing by social media creates angst as it tends to encroach into urban development areas. In this panel session, the topics of discussion will include:

- Social media practitioner's roles and challenges.
- Building trust, credibility and legitimacy of Social License to Operate.
- Relationship of socio-political/legal acceptance with community and market acceptance.
- Means to measure social license effectiveness and industry compliance.

## Session Chairs

Siti Normaizan Hassan
Head, Unconventional Center of Excellence
**PETRONAS Canada**

Andrew Garnett
Director, UQ Centre for Natural Gas
**The University of Queensland**

## Speakers

Sarah Browne
Director - Public Affairs
**Australian Petroleum Production & Exploration Association**

Donald McMillan
Principal Engineer
**Oil Gas CBM Services Pty Ltd**

Katherine Witt
Senior Research Fellow
**The University of Queensland**

# Panel Session 4: How Good is our Ability in Predicting Future Production?

**Thursday, 18 November 2021** | 1030-1130 hours (UTC +10)

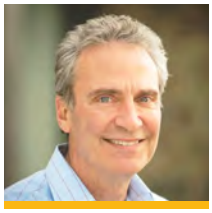
Future oil and gas production forecasts are used for estimating remaining reserves, optimising production operations as well as asset planning. Numerous methods to predict future production are utilised in the industry, including traditional Decline Curve Analysis (DCA) to newly introduced statistical methods. Yet, no prediction is infallible and continual revisions to the Estimated Ultimate Recovery (EUR) expectations occur, sometimes with serious consequences such as associated write-downs.

This panel session will address the accuracy of our forecasting methods, the current trends, and the impacts of the EUR expectations to operations and transactions. The questions raised during the session include:

- Historical perspective on the expectations and actual production. Lessons from Queensland CSG producers as well as North American examples.
- Do we accurately capture resolvable uncertainty on one side and off-model events on the other when planning the development?
- What is the impact of execution on production compared to initial production forecasts? How well non-geological factors are captured in future production predictions?
- Do we see the learning curve in the projects? Does production get "better" or "worse" with time? What are the possible causes of these trends?
- What is a useful benchmarking for production prediction?
- Do we have adequate tools for predicting future production from coal and shale?

## Session Chairs

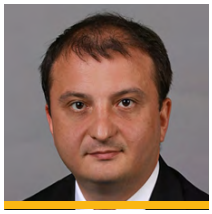
Dan Kuznetsov
Principal Reservoir Engineer
**Arrow Energy**



David J. Campagna
Independent Advisor
**Independent**

Thomas Flottman
Principal Geologist and
Chief Geoscientist
**Origin Energy**

## Speakers



Dilhan Ilk
Senior Vice President,
North America Division Manager
**DeGolyer and MacNaughton**

Edith Lagendijk
Director and Principal Consultant
**New Energy Consulting**

Petrina Weatherstone
Lead Long Term Planning
**Origin Energy**

Saikat Mazumder
Reservoir Engineering
Discipline Lead
**QGC**

# Technical and Knowledge Sharing ePoster Sessions

More than 100 technical presentations will be presented across a vast variety of technical topics at the Technical and ePoster Sessions.

Technical Sessions include:

- Advances in Hydraulic Fracturing
- Big Data and Applications of Machine Learning
- Case Studies
- CO2, the Environment and Social License to Operate
- Geomechanics of the Wellbore: Rock Properties, Near-Field Stresses, and Stability
- Geomechanics: The Intersection of Geoscience and Engineering
- Geophysics
- Hydraulic Fracturing Diagnostics
- Innovative Materials and Emerging Technologies as Applied to Unconventionals
- Petrophysics/Formation Evaluation
- Production Technology
- Reservoir Engineering for Shales: From Permeability to EOR
- Unconventional Reservoir Engineering
- Well Construction

Find out more from the virtual Asia Pacific URTeC 2021 website.

# Sponsored Seminar 1:
# Copula Geostatistics - Because “Normal” Isn’t Always the Best Choice

**Tuesday, 16 November 2021** | 1030-1100 hours (UTC +10)

Traditional geostatistical techniques such as Kriging or Sequential Gaussian Simulation are regularly used for reserves estimations. However, they often struggle to properly characterise complex environmental systems. A key problem of these approaches is that they are all based on the assumption of multivariate normal (or Gaussian) distributions which, by definition, leads to spatial symmetry. Spatial symmetry, however, is rather rare and thus, its assumption is often unrepresentative of the true spatial dependence structure. Spatial copulas are a novel geostatistical tool which go beyond the assumption of multivariate normal distributions. They enable the analysis and subsequent modelling of asymmetric spatial dependence structures which are omnipresent in environmental systems. Improved modelling of these asymmetries leads to more realistic characterisations of the system under study, which in turn, can lead to improved modelling capabilities of dependent variables (such as groundwater or multi-phase flow and transport behaviour). This seminar aims to introduce the concept of spatial asymmetry and how copulas can serve as a tool to detect and to model this asymmetry. Examples will be used to visualise spatial asymmetry and to demonstrate that normal isn’t always the best choice in geostatistics.

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AUSTRALIA

## Moderator

Andrew Garnett
Director, UQ Centre for Natural Gas
**The University of Queensland**

## Speaker

Sebastian Hoerning
Energi Simulation
Postdoctoral Research Fellow
UQ Centre for Natural Gas
**The University of Queensland**

# Sponsored Seminar 2: Nimble Nodes for Future Proof Seismic Surveys

**Wednesday, 17 November 2021** | 1000-1030 hours (UTC +10)

The new generation of very nimble nodes have demonstrated the practicality and the benefits of UHD surveys with densities above 100 million traces per km2. This new generation of dataset stands out by its fitness to multiple processing routes and its future proofing to new technologies, a characteristic that has significant cost, time and environmental implications, especially in areas where reacquiring seismic is difficult or sometimes impossible. In this seminar, we will retrace the journey of trace density and illustrate the above statements with real seismic examples from a 184 milion traces per km2 survey acquired in the UAE.

*Proudly Sponsored by*

STRYDE

## Speaker

Amine Ourabah
Head of Processing
**STRYDE Limited**


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## Why Join or Renew

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