

Programme

THE SHALE GAS INDUSTRY IN SOUTH AFRICA:

Toward a Science Action Plan

31 August – 1 September 2017



science
& technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA



THE SHALE GAS INDUSTRY IN SOUTH AFRICA: TOWARD A SCIENCE ACTION PLAN
31 August – 1 September 2017
Boardwalk Conference Centre, Port Elizabeth
DAY 1

Start	Item	Individual	Min
8:00	Registration		
SESSION 1: INTRODUCTION AND CONTEXT			
Facilitator: Prof Roseanne Diab, Executive Officer, Academy of Science of South Africa (ASSAf)			
9:15	Welcome Remarks	Prof Barney Pityana Vice-President, ASSAf	15
9:30	Keynote Address	Dr Phil Mjwara Director-General, Department of Science and Technology (DST)	30
10:00	Photograph and Coffee Break		40
SESSION 2: TECHNICAL READINESS OF SOUTH AFRICA TO SUPPORT A SHALE GAS INDUSTRY			
Facilitator: Ms Marlett Balmer, Senior Energy Advisor, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)			
10:40	Introduction to the Study	Prof Roseanne Diab Executive Officer, ASSAf	5
10:45	Presentation on the ASSAf Report Findings and Recommendations	Prof Cyril O'Connor Chair of the ASSAf Panel, University of Cape Town (UCT)	30
11:15	Discussion		45
12:00	Lunch		60
SESSION 3: SHALE GAS DEVELOPMENT IN THE CENTRAL KAROO: A SCIENTIFIC ASSESSMENT OF THE OPPORTUNITIES AND RISKS			
Facilitator: Mr Saliem Fakir, Head of Policy and Futures Unit, World Wide Fund (WWF)			
13:00	Introduction to the Study	Ms Dee Fischer Chief Director, Department of Environmental Affairs	5
13:05	Presentation on Report Findings and Recommendations	Prof Bob Scholes Project Leader, University of the Witwatersrand	30
13:35	Discussion		45
14:20	Coffee Break		30
SESSION 4: THE REGULATORY ENVIRONMENT			
Facilitator: Ms Lindiwe Mekwe, Chief Executive Officer, Petroleum Agency South Africa, PASA)			
14:50	Introduction	Prof Jan Glazewski UCT	20
15:10	Department of Mineral Resources	Mr Tebogo Motloung, PASA	15
15:25	Department of Environmental Affairs	Ms Dee Fischer Department of Environmental Affairs	15
15:40	Department of Water Affairs (DWA)	DWA Representative	15
15:55	Discussion		35
16:30	Closure	Mr Mmboneni Muofhe Deputy Director-General, DST	10
18:30	Gala Dinner		

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Start	Item	Individual	Min
08:30	Welcome	Prof Roseanne Diab, ASSAf	10
SESSION 5: INTERNATIONAL PERSPECTIVES ON THE SHALE GAS INDUSTRY			
Facilitator: Ms Rebecca Maserumule, Chief Director for Hydrogen and Energy (DST)			
08:40	Introduction		5
08:45	Perspectives on the Botswana Natural Gas Industry; Challenges and Future Outlooks	Dr Benson Modie University of Botswana	20
09:05	An Overview of Resource Play Developments in Australia: Technical, Economic, Environmental and Political Aspects	Dr Dennis Cooke University of Adelaide	20
09:25	North American Shale Energy Development – Past Impacts, Future Implications	Mr Tom Murphy Penn State Marcellus Centre for Outreach and Research	20
09:45	Discussion		40
10:25	Coffee Break		30
SESSION 6: SOUTH AFRICAN PERSPECTIVES			
Facilitator: Mr Paul Hardcastle, Director of Planning and Policy Coordination, Western Cape Government			
10:55	Introduction		5
11:00	A Science Plan for (Ground)water Resources in Advance of Shale Gas Development	Dr Shafick Adams and Dr Kevin Pietersen Water Research Commission	15
11:15	AEON's Transdisciplinary Karoo Baseline Research and Beyond	Prof Maarten de Wit Nelson Mandela University	15
11:30	Results from the CIMERA-KARIN Scientific Drilling Project and Implications for the Shale Gas Potential of the Southern Main Karoo Basin	Prof Michiel de Kock University of Johannesburg	15
11:45	Karoo Deep Drilling and Geo-Environmental Baseline Programme	Ms Dawn Black Council for Geoscience	15
12:00	Discussion		30
12:30	Lunch		
SESSION 7: ROUND-TABLE DISCUSSIONS			
Facilitator: Mr Somila Xosa, Director of Transport Fuels (DST)			
13:30	Purpose of Workshop and the Way Forward for Government	Advocate Thabo Mokoena Chair: Hydraulic Fracturing Monitoring Committee	30
14:00	Round Table 1: Monitoring Facilitator: Mr Mthozami Xiphu, South African Oil and Gas Alliance (SAOGA)	Ms Surina Esterhuyse, University of the Free State (UFS) Dr Gregor Feig, CSIR Mr David Aphane, PASA Mr Greg Schreiner, CSIR Prof Doreen Atkinson, UFS Dr Joh Henschel, South African Environmental Observation Network (SAEON)	40
14:40	Discussion		40
15:20	Round Table 2: Human Capital Development for the Shale Gas Industry Facilitator: Dr Phethiwe Matutu, National Research Foundation	Mr Dave Wright, Dave Wright Consulting Dr Neehal Mooruth, Shell Mr Niall Kramer, SAOGA	30
15:50	Discussion		30
16:20	Closure and Vote of Thanks	Prof Cyril O'Connor	15

Biographies

Benson Modie

Dr Benson N Modie is a geologist, lecturer, author, blogger and motivational speaker. He served in the Botswana Public Service from 1988 to 2008. He founded the Centre for Knowledge (CfK), an academy for life-coaching in people skills on the management-of-self-in-life. In 2011, he joined the University of Botswana as a lecturer, and still travels around taking part in motivational seminars titled CfK Public Education Seminar Series – Personal Development for Individual Effectiveness. He believes that real growth, i.e. economic, health, education, organisational, etc., is profoundly dependent on the developmental qualities of individuals that make up different workplaces. Dr Modie has devoted much of his time, through his motivational seminars and books, to encourage others, particularly students, to embrace the learning process for optimal personal productivity.

Cyril O'Connor

Professor Cyril O'Connor is a senior research scholar in the Department of Chemical Engineering at the University of Cape Town (UCT). He holds a PhD from UCT and a DEng from the Stellenbosch University (SU). He was the Director of the Centre for Minerals Research and was founder Director of the Centre for Catalysis Research. He is President of the International Mineral Processing Council, is a former Vice-President of the International Zeolite Association, is a member of the Executive Committee of the South African Academy of Engineering (SAAE) and is CEO of the South African Minerals to Metals Research Institute. He is an Honorary Fellow and Fellow of the South African Institute of Mining and Metallurgy, a Fellow of the Royal Society of South Africa, UCT, the SAAE, the South African Institution of Chemical Engineering, International Union of Pure and Applied Chemistry and is a founder Member of ASSAf. In 2017 he was elected as a Foreign Member of the United States National Academy of Engineering.

Dave Wright

Mr Dave Wright has been an independent consultant since retiring from Engen Petroleum Ltd in 2014. Between 2013 and 2014 he was the Special Advisor to the Managing Director and Chief Executive Officer. Prior to this, he held several General Manager positions over 12 of the 23 years he was with Engen. He spent the first 15 years of his career as a Lecturer in Chemical Engineering at the University of KwaZulu-Natal. He is a member of the Board and Exco of the South African National Energy Association (SANEA) and is currently the Secretary-General of SANEA. He is also an Adjunct Professor in the Department of Chemical Engineering at UCT and was a member of the Ministerial Advisory Council on Energy in South Africa until February 2017 when its term of office was completed.

Dawn Black

Dawn Black received her Master's degree from the Nelson Mandela Metropolitan University, Port Elizabeth, South Africa in 2015. Her research was related to the stratigraphic characterisation of the Collingham Formation, in the context of shale gas from a borehole (SFT 2) near Jansenville, Eastern Cape, South Africa; with further investigations focused on the Collingham Formation as a potential caprock to shale gas. She is currently employed as a senior scientist by the Council for Geoscience (Eastern Cape Unit), and is part of the scientific team undertaking the Karoo deep drilling and geo-environmental baseline programme.

Dennis Cooke

Dr Dennis Cooke has over 25 years of experience in the geoscience industry and academia. He is the programme manager for GeoFrac – the ASP's research programme in unconventional resources. His previous positions include initiating and managing a shale gas research consortium at the University of Adelaide, Chief Geophysicist at Santos, and numerous industry positions in Alaska, Indonesia, Texas and Colorado. He is a past-president of the Australian Society of Exploration Geophysicists and a past Vice-President of the (International) Society of Exploration Geophysicists. His industry experience includes research, seismic processing, exploration, development and technical service. He has done exploration and development geoscience in Australia, Alaska, Indonesia, Mid-Continent US, Gulf of Mexico and the North Sea. He has published in the areas of seismic inversion, reservoir characterisation and seismic migration. His current technical interests include seismic inversion techniques and shale gas exploration techniques.

Doreen Atkinson

Prof Doreen Atkinson is a Research Associate in the Department of Development Studies, Nelson Mandela University. She holds a Masters degree from the University of California (Berkeley) and a PhD from the University of KwaZulu-Natal. She is also a Trustee of the Karoo Development Foundation, a non-profit organisation working to promote socio-economic development in the Karoo and Kalahari regions. Trained as a political scientist, she has broadened her focus to include municipal governance, intergovernmental relations, rural development, small town social dynamics, local economic development, heritage and rural tourism. She lives and works in Philippolis, a small town in the southern Free State.

Greg Schreiner

Mr Greg Schreiner has a MSc in environment and development from the University of Cambridge. He has worked at the CSIR for the past seven years leading a diverse range of assessment processes. He is interested in novel approaches to scientific assessment in support of evidence-based decision-making and is currently completing a PhD on this topic at Wits University under the leadership of Prof Bob Scholes. From 2015 - 2017, he managed the day-to-day aspects of the shale gas scientific assessment and was the lead author of the primary outputs and recommendations from that study, which included the key decision-support tools for government. He is an internationally accredited commercial mediator and in June 2017 was selected by Mail & Guardian as one of Top 200 Young South Africans.

Gregor Feig

Dr Feig has a PhD in biogeochemistry from the Max Planck Institute for Chemistry, Germany. His key competencies are in the measurement of atmospheric composition and the determination of biogeochemical fluxes between the land surface and the atmosphere. His interests lie in ecosystem flux measurements, atmospheric composition measurements and land system modelling.

Jan Glazewski

Professor Jan Glazewski is a Professor of law in the Institute of Marine and Environmental Law at UCT. He was Special Advisor to the former Minister of Environmental Affairs & Tourism, Mr Mohammed Valli Moosa in 2003/4. In the early 1990s he was involved in the inclusion of environmental rights in both the Namibian and South African Constitutions. His book *Environmental Law in South Africa* (Butterworths LexisNexis 2005) was awarded the UCT book award. He has recently published his latest book *Hydraulic Fracturing in the Karoo: Critical Legal and Environmental Perspective* co-edited with Surina Esterhuysen. His current research interests include climate change law, energy law and environmental law. His recent publications and reports are in the area of climate change liability, climate change and energy.

Joh Henschel

Dr Henschel studied at UCT and the University of Pretoria with majors in oceanography and zoology. Since 1986 he has been employed as an ecologist at the Desert Research Foundation of Namibia, National Museum of Namibia, University of Wuerzburg in Germany, Gobabeb Research and Training Centre in Namibia, and the South African Environmental Observation Network (SAEON). Fields of special interest include desert ecology, desertification, ecological restoration, environmental assessments, and environmental monitoring. He initiated and subsequently managed the involvement of SAEON in ecological studies relating to the shale gas development, including participation in literature reviews and the establishment of the BioGaps set of study sites across the Upper Karoo, which initiate the long-term monitoring of environmental changes across the shale gas area on a long-term basis.

Kevin Pietersen

Dr Kevin Pietersen is a professional registered scientist and holds an extra-ordinary position at the Institute for Water Studies at the University of the Western Cape. He has worked for the past 25 years in the water and earth sciences sectors. He has extensive experience in integrated water resource management; strategy development and planning; exploration, development and management of groundwater; groundwater governance; capacity building and technology transfer of scientific information; and SADC/Africa-wide water resource assessments. He was the team leader for the Water Research Commission projects "Water Science Plan for Unconventional Gas" and "Unconventional Gas Exploration and Production and its Impact on South Africa's Water Resources". He was a member of the South African National Water Advisory Committee and has also served as Presidents of the Water Institute of Southern Africa and the Geological Society of South Africa.

Maarten de Wit

Professor Maarten de Wit is a chartered field geologist and holds the chair of Earth Stewardship Science at Nelson Mandela University. He has held research positions at Columbia University, New York; Lunar and Planetary Institute, Houston; the University of Santiago, Chile; and professorships at Massachusetts Institute of Technology (MIT); the Institut Physique du Globe de Paris (IPGP), Germany's National Research Centre for Earth Sciences (GFZ) in Potsdam; the University of Utrecht; and Kingston University, Canada, where he was awarded a DSc (hc). He worked for several years for the UNDP in Ethiopia and is presently a visiting professor at the Southampton University, UK. He is an honorary fellow of the Geological Societies of London, UK, and of the USA, and is a founder Member of ASSAf. Born in Holland, educated in Ireland and UK, he traveled for many years across the Americas, Antarctica and Europe, and finally settled in South Africa. As science director of AEON (Africa Earth Observatory Network) he is interested in transdisciplinarity and co-evolving assemblages, and the early earth.

Michiel de Kock

Professor Michiel de Kock is a paleomagnetist and Senior Lecturer at the University of Johannesburg. He is interested in global tectonics through Earth history and the formation and break-up of Supercontinents. Of particular interest are the interplays between global tectonics and the biosphere, atmosphere and hydrosphere and their relation to the origin of large mineral deposits. His current research is largely focused on (but is not limited to) using the high-quality information content of the Large Igneous Province record to resolve the position of the Kaapvaal craton within pre-Pangean continents with implications for mineral deposit targeting.

Neehal Mooruth

Dr Neehal Mooruth received his PhD in chemical engineering from UCT, which was focused on the remediation of acid mine drainage (AMD) via a biological treatment system. Thereafter he joined Shell International in the role of a drilling engineer (2014). For the first two years, he worked in the unconventional business, whereby he supported drilling operations in the Permian Basin out of the Houston office. He also has extensive field experience from running night operations as a wellsite supervisor, on Ensign and Precision Drilling rigs. Subsequently, he worked on a deep-water project off the coast of Tanzania, drilling for natural gas on the Noble Globetrotter 2. Currently, he is the lead (in-country) Well Engineer working on the Karoo project.

Niall Kramer

Mr Niall Kramer became the CEO of SA Oil and Gas Alliance at the beginning on 2017. He is an experienced corporate marketing leader with extensive global, Asian, African and South African experience in oil and gas, marketing and corporate areas. He was educated at UCT and he joined Caltex in South Africa in 1990 where he moved across many functions, in both corporate and marketing, and was posted to Singapore, Thailand and New Zealand. Twenty years later in 2010, after leading the marketing integration for what became Chevron (with the merger of Caltex, Texaco and Chevron) for Europe, Africa, and the Middle East, he became Director of Business Development for both Strika Entertainment and Market Pulse Int. In 2013, he joined Shell Upstream BV to manage stakeholder relationships on the key Karoo Shale gas project.

RJ (Bob) Scholes

Professor Bob Scholes is a systems ecologist with a particular interest in the savannas of Africa. He is among the top 1% of environmental scientists worldwide based on citations. He has led several high-profile studies (e.g. the Assessment of Elephant Management, Commission on Sustainable Agriculture and Climate Change, Strategic Assessment of Shale Gas Development) and large research campaigns (e.g. SAFARI 2000, Southern African Millennium Assessment). He was an author of the Intergovernmental Panel on Climate Change 3rd, 4th and 5th assessments. He has been on the boards of the International Centre for Research in Agroforestry, the South African National Parks and South African National Space Agency. He is a Foreign Associate of the US National Academy of Sciences, Fellow of the CSIR, Fellow of the Royal Society of South Africa, Member of ASSAf, a Research Associate of the CSIR, an NRF A-rated scientist, and a winner of the National Science and Technology Forum Lifetime Contribution to Science Award.

Sean Johnson

Mr Johnson is the Unconventional Resources Evaluation Manager at the Petroleum Agency of South Africa.

Shafick Adams

Dr Shafick Adams is at the Water Research Commission (WRC) in Pretoria, South Africa where he manages research projects related to groundwater and water resources protection. He is also the Executive Manager in charge of the Water Resource Management and Ecosystems key strategic area. He holds a PhD and MSc (cum laude) from the University of the Western Cape where he lectured prior to his appointment to the WRC. He is the past-chair of the Groundwater Division of the Geological Society of South Africa and is co-chair of the International Water Association's Groundwater Restoration and Management Specialist Group. Some of his research interests are in groundwater recharge assessments, chemical characterisation of groundwater, capacity development, and water resource management.

Surina Esterhuysen

Ms Surina Esterhuysen is a researcher at the Centre for Environmental Management, University of the Free State (UFS). Recently, she has been extensively involved in work related to unconventional oil and gas extraction and led the project on the unconventional oil and gas interactive vulnerability map and monitoring framework development for the South African WRC. She was also involved in the Strategic Environmental Assessment on Shale Gas Development in South Africa and co-edited the book Hydraulic Fracturing in the Karoo: Critical Legal and Environmental Perspectives with Jan Glazewski.

Tebogo Motloutsi

Mr Motloutsi holds a B Juris degree from the University of Pretoria, a Bachelor of Laws degree from the University of South Africa, Certificate in World Legal Systems and Contracts for Oil and Gas (CWC School of Energy), Certificate in Environmental Law (North-West University), Certificate in the Development of Unconventional Gas (International Human Resources Development Corporation), and a Certificate in Oil and Gas fundamentals (CWC School of Energy). He is Acting General Manager: Regulation, Petroleum Agency South Africa (PASA), a state-owned entity responsible for regulating the upstream oil and gas in terms of the Mineral and Petroleum Resources Development Act, 2002. He has regulatory experience in the minerals, oil and gas sector and in energy policy development.

Thomas Murphy

Mr Tom Murphy is Director of Penn State's Marcellus Centre of Outreach and Research (MCOR). He has 32 years of experience working with public officials, researchers, industry, government agencies, and landowners during his tenure with the outreach branch of the University. His work has centred on educational consultation in natural resource development, with an emphasis specifically in natural gas exploration and related topics for the last 11 years. He lectures globally on natural gas development from shale, the economics driving the process, and its broad impacts including landowner and surface issues, environmental aspects, evolving drilling technologies, critical infrastructure, workforce assessment and training, local business expansion, resource utilisation, financial considerations, and liquefied natural gas export trends. He provides leadership to a range of Penn State's related Marcellus research activities and events. He is a graduate of Penn State University.

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