



**SYMPOSIUM: PROPOSED SHALE GAS  
MINING/HYDRAULIC FRACKING: A CONFLUENCE  
OF SCIENCE, HUMANITIES, LAW AND  
GOVERNANCE**

**Institute of Marine and Environmental Law (IMEL)  
University of Cape Town**

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# SESSION 1: SETTING THE SHALE GAS SCENE

## PURPOSE OF THE WORKSHOP

The original purpose of the workshop was to gather together the authors of a proposed inter-disciplinary book provisionally titled “Shale Gas Mining/ Fracking in the Karoo: critical perspectives”. More specifically the idea was to determine the content and format of the proposed book on shale gas exploration and extraction (i.e. should some chapters be abandoned; should chapters be shorter; what should be the underlying thread of the book etc.).

However because of significant outside interest in the shale gas issue it was decided to broaden participation in the workshop mainly to accommodate to a broader public in particular three visiting academics who presented and gave perspectives from the USA (Prof Melissa Powers); the UK (Prof. Lindsay Bremner); and Poland (Adjunct Prof. Rucinska). Be that that as it may the rest of the presenters were authors all of who have agreed to contribute to chapters of the proposed book. A symposium Agenda is attached as Appendix B.

## WELCOME

*Prof. Francis Petersen (Deputy Vice-Chancellor, UCT)*

The energy sector forms an essential component of any economy. The main supply of energy in South Africa is coal. However, as it is not a renewable resource, South Africa should look at alternative ways of generating energy, including shale gas. In order to set the framework for the workshop, Professor Petersen presented the following four issues as guiding principles:

- a. There is strong support for shale gas extraction due to it enhancing bio-economics and providing security of energy supply. Its contribution to economic development is based on its potential to create jobs extensively.
- b. An opposing argument is that there are challenges, e.g. where and to what extent would these jobs be created. The questions are therefore: does it contribute towards economic sustainability and what would be its socio-economic impact.
- c. Another aspect is the environmental challenges linked to shale gas extraction, e.g. water pollution, biodiversity etc. As shale gas has already been incorporated in South Africa’s integrated resource plan, what information could universities provide in order to safeguard the responsible extraction of shale gas?
- d. Another related issue is governance – not only monitoring but also reporting. The question is whether there is political will and the capacity to do so.

Within UCT, many disciplines have been looking at issues related to shale gas in order to determine whether a multidisciplinary approach could add value. The intention is not only to contribute towards knowledge production but also to inform policy makers.

## SETTING THE CONTEXT: THE BOOK PROPOSAL, LAW, GOVERNANCE AND BEYOND

*Prof. Jan Glazewski (Institute of Marine and Environmental Law, UCT)*

In his State-of-the-Nation address in 2014, the President mentioned especially nuclear and shale gas when referring to the energy needs for South Africa. The country has achieved a number of milestones in regard to shale gas extraction specifically but a key question is: how do we ensure responsible implementation,

proper monitoring, and enforcement of regulations? Mostly, does the South African government have the capacity to do all of the above?

One challenge with the South African government is the fact that many departments have issues legislation on shale gas but these do not seem to collaborate when drawing up the legislation.

In terms of a way forward, the following challenges were presented as important facts in regard to shale gas:

- How should sustainable development be defined within this context?
- Multidisciplinary research is essential (science, engineering, humanities, socio-economic etc.)
- What is the role of the EIA (Environmental Impact Assessment)

Against the backdrop of the above, the proposed book on shale gas exploration and extraction will provisionally comprise the following chapters:

- Ch 1: Introduction & Overview (Glazewski & Winter)
- Ch 2: The South African energy context (Wakeford)
- Ch 3: Economic fracking in the Karoo (Fakir)
- Ch 4: Geology and geo-hydrology (De Lange)
- Ch 5: Water (quantity) (Avenant & Esterhuyse)
- Ch 6: Water (quality)/wastewater (Lewis)
- Ch 7: Seismology (Kijko)
- Ch 8: Biodiversity (Henschel/Hoffmann/Todd)
- Ch 9: Palaeontology & Archaeology (Morris)
- Ch 10: Lessons from USA (Powers)
- Ch 11: The Polish Experience (Rucinska & Glazewski)
- Ch 12: Perspectives from the Humanities (Green)
- Ch 13: Need and desirability: values and attitudes (Katzchner)
- Ch 14: Public Health Aspects (London/Willems/Dalvie)
- Ch 15: 'A sense of place' (Feris)
- Ch 16: Environmental Assessment: critique (Humby /Fig)
- Ch 17: The MPRDA: critical perspective (Plit)
- Ch 18: Tax Policy (Steenkamp)
- Ch 19: Regulation, monitoring and compliance (Glazewski)

#### *Discussion points after presentation*

- The theme of the book could be: *look before you leap*. It would embody the precautionary principle, a developing principle in international environmental law that has been incorporated in South African domestic legislation.
- Authors are encouraged to highlight the fact that a lot is unknown.
- Those chapters that have a huge overlap should be conflated into one (e.g. instead of having a separate chapter on surface water it be rather included in the chapter on ecosystems). This would add to the interdisciplinary approach.

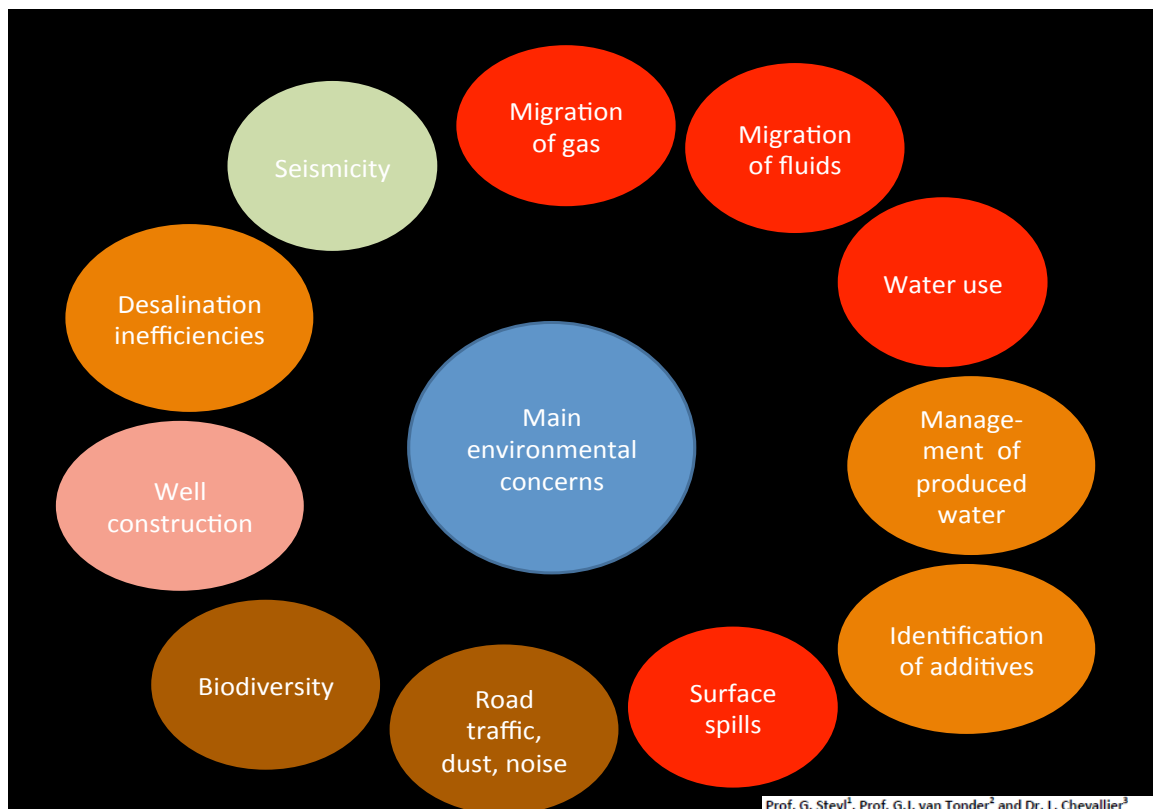
## **GEOPHYSICAL PERSPECTIVE ON SHALE GAS EXTRACTION IN SOUTH AFRICA: KNOWLEDGE GAPS**

*Dr Kevin Winter (Department of Environmental & Geographical Sciences, UCT)*

The above-mentioned topic was presented along the following themes:

- a. Ideological perspective as a means to frame an approach to exploitation of resources: using Daly's Triangle, sustainable development entails the relationship between the environment ("ultimate means") and equity & wellbeing of humans ("ultimate ends"). The "intermediate means/ends" refer to economy, technology, politics and ethics. The interconnectedness of these three levels requires caution, e.g. economy cannot be treated as the "*ultimate end*" if it jeopardises the environment.

- b. The current drivers of change, which raises the demand for energy amongst other resources, are globalization, trade and development.
- c. Fracking within the context of South Africa: (i) 90% of electricity is generated from coal in RSA; (ii) South Africa has 390tcf (estimates are inaccurate but 32tcf has also been suggested) of shale gas resources; (iii) South Africa could have the eighth largest shale gas reserve in world; and (iv) South Africa is the first country to reverse a moratorium on fracking.
- d. In the Karoo, the following are the main environmental concerns:<sup>1</sup> Those highlighted in red are critical issues where the anticipated environmental impacts are greatest in exploitation and operational phases.



The Karoo is a vast landscape covering nearly 75% of South Africa's land surface. The sites and potential impact of shale gas extraction on the Karoo is therefore enormous.

In conclusion:

1. The issue of fracking is highly charged informed by a confusion of experiences from elsewhere in world;
2. Scientific data could reduce the confusion, but the use of knowledge must be embedded in moral and ethical imperatives, e.g. values that inform intergenerational equity;
3. The issue of governance is essential should fracking go ahead; and
4. Fracking is not an answer to South Africa's energy need but rather the use of renewable resources.

## THE SOUTH AFRICAN ENERGY CONTEXT

*Dr. Jeremy Wakeford (Sustainability Institute, University Stellenbosch)*

The following provided the framework for the presentation:

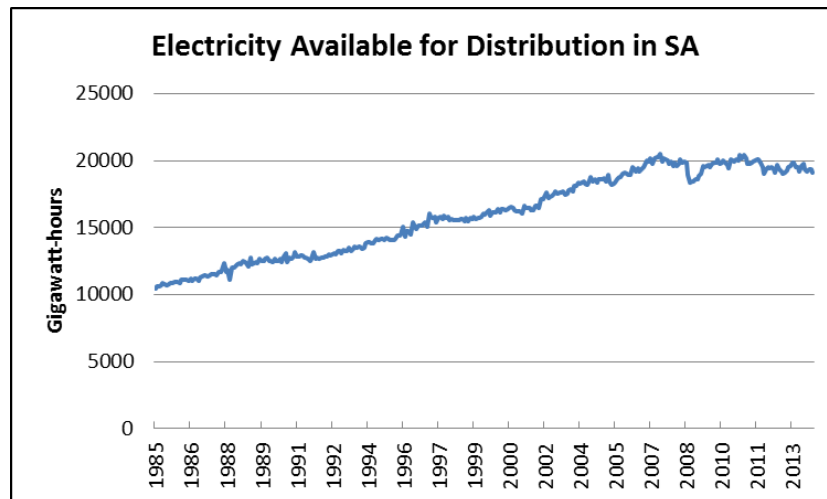
<sup>1</sup> Steyl, G., van Tonder, G.J. and Chevallier, L. 2012. State of the Art: Fracking for shale gas exploration in South Africa and the impact on Water Resources. Report to the Water Research Commission Report No. KV 294/11 ISBN 978-1-4312-0225-6

- a. South Africa has an energy- and emissions-intensive economy (e.g. world's 14<sup>th</sup> highest absolute CO<sub>2</sub> emissions etc.)
- b. South Africa's economic growth is stagnating – partly due to energy supply constraints and high energy prices

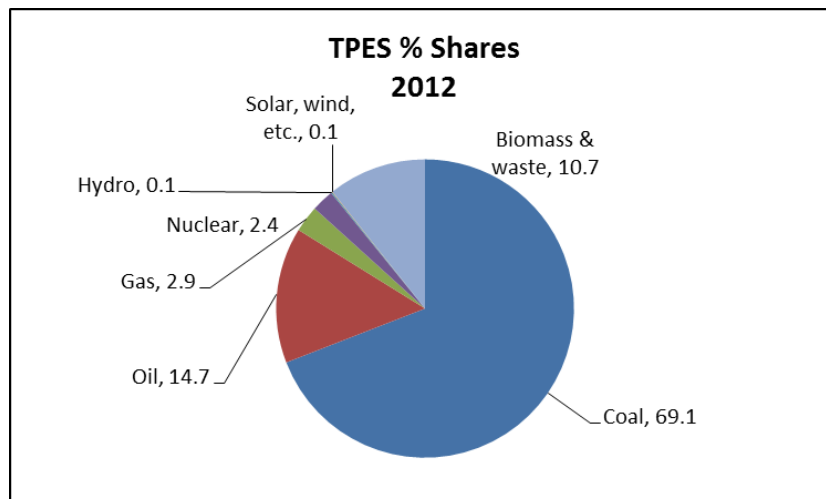
Within the context of the above, the motivations for shale gas extraction are as follows:

1. Shale gas will improve security of energy supply

The graph below shows a slow decline in electricity availability in South Africa.



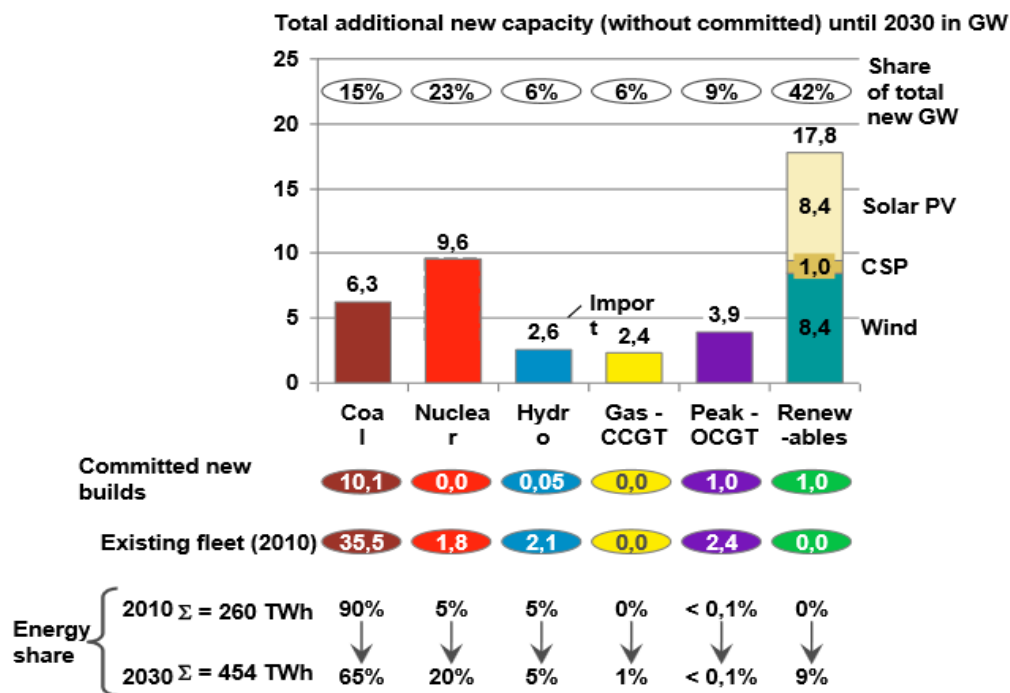
2. Shale gas will diversify the energy mix away from coal so as to reduce carbon emissions. The graph below demonstrates South Africa's primary energy mix during 2012.



Source: IEA

Instead, the Integrated Resource Plan 2010-2030 aims for the energy-mix to be as follows:

## Integrated Resource Plan 2010-2030



3. Shale gas will boost industrial development, create jobs and reduce energy & income poverty.

The following table presents the advantages and disadvantages of using shale gas:

| ADVANTAGES                                         | DISADVANTAGES                          |
|----------------------------------------------------|----------------------------------------|
| Cleaner than coal                                  | Environmental & water footprint/legacy |
| Potential replacement for imported oil and gas     | Dirtier than renewables                |
| Multiple uses                                      | Fugitive methane emissions             |
| Mid-merit power generation, back-up for renewables | Lack of existing infrastructure        |

In conclusion:

- It's all just speculation before exploratory drilling and fracking have taken place
- Development timeline is approximately 10+ years while renewable energy, for example, is much faster
- Various potential uses of gas, but there are also challenges linked to these
- All the costs and benefits need to be carefully weighed, relative to other alternatives (e.g. nuclear etc.). However, the producing companies will potentially make huge profits.

## ECONOMICS OF FRACKING

*Mr Salim Fakir (World Wildlife Fund, SA)*

The reason why shale gas is a cheap form of energy is due to the ability to store it. Within the USA market, the traders determine the price of it. Furthermore, within the USA there is both dry and wet gas. The latter allows for additional products to be extracted. This is different from the RSA situation where there is only

dry gas. Another factor impacting on the price of gas is the decline in the oil prices. This has already prompted many changes in the USA in regard to the shale gas business.

Due to the fact that there is no way to know about the amount of shale gas in any particular area, any predictions of cost are merely estimates. This is the case as, while it might be evident that there is shale gas in a particular area, it is likely to result in a number of wells to be drilled before shale gas is found. In other words, knowing the geography of a particular does not necessarily translate into a flourishing business of shale gas extraction. The recovery rates vs. finances could therefore be very different from each other.

Another factor impacting on the shale gas business is the fact that approximately 60-70% of shale gas is extracted in the first couple of months. Thereafter a decline in production sets in and that will have a potentially negative impact on the profit margins should the business has huge capital expenditure without having viable prices for selling shale gas.

In order to avoid a financial predicament, South Africa needs to establish a model that takes into account all the costs e.g. drilling, water, maintenance of the wells, transport, infrastructure etc.

#### *Discussion points after presentation*

- It is unclear whether government will incentivize or subsidise fracking
- Issue of royalties crucial: if the extraction of shale gas is high during the first couple of years and then decrease, then the prices of gas will be higher in the latter period. Companies would therefore want to charge royalties only during the latter period as it will relate to the higher prices of gas
- Shale gas companies often get deals with government to balance their performing and non-performing asses
- Real game for Shell is to keep the stock price high.

## SESSION 2: GETTING DOWN AND DIRTY

### KAROO BIODIVERSITY

*Prof Timm Hoffman & Simon Todd (Plant Conservation Unit, UCT)  
Dr Joh Henschel (South African Environmental Observation Unit - SAEON)*

In discussing the outline of their chapter, their approach was formulated as follows:

- It concerns natural capital (natural stocks and processes that underlie flows of ecosystem goods and services and biodiversity conservation and enhance all aspects of human well-being)
- Focus on facts
- Highlight knowledge gaps

The first section of the book will deal with the area where fracking will occur. It will then proceed into discussing the environmental characterization of the study area in terms of

- Vegetation
- Surface water
- Main drivers (rainfall, temperature, fire, herbivory by ungulates; irruptions of locusts and birds)

The next section will deal with those activities that will have a major impact on the Karoo ecosystems, habitats, species and populations. These are,

- Clearing, construction, land degradation (habitat loss, pollution – chemical and dust – natural recovery potential of cleared or impacted land)
- Source of other resources for mining (water loss and degradation caused by sand mining)
- Human activities at gas sites (poaching and alien plant introduction; litter; accidental/ anthropogenic fires due to construction camps and emerging settlements)

A major concern is landscape fragmentation: gas mining developments will reduce areas of open space needed to support flora and fauna typical of the area. It will furthermore affect critical resources and processes needed for the fauna and flora to persist.

Section 4 will deal with those aspects likely to be mostly affected by fracking: geographic areas; ecosystems; habitats; species; and populations.

Section 5 will outline the indicators to measure the impact of fracking over short, medium and long timeframes. These are climate, water, soil, biotic, indicator species; introduced species; natural resource use. It will then also describe indicators relating to the possible causes of change in natural capital: groundwater condition; contamination; state of environment; human demography; socio-economics and environmental policy compliance.

The following issues will be addressed in the final section:

- How would a post-frack landscape look like in comparison to pre-fracking?
- Who will be the winners and who will be the losers?
- Which elements would need to recover given that natural recovery is extremely slow in Karoo?

*Discussion points after presentation:*

- Limited research on the Nama area due to the fact that it is so far removed from any university. It needs to be rectified as it poses serious threats due to the fact that there is limited knowledge on which to base decisions.
- Simon Todd has co-produced a publication in which they proposed a model for science that would be very appropriate. What is currently happening is that we take the USA's sources of information and apply these to South Africa.

## KAROO ARCHAEOLOGY & PALAEOLOGY

*Dr David Morris (McGregor Museum, Kimberley)*

From the perspective of archaeology and palaeontology, the Karoo basin offers a uniquely rich insight into the Stone Age, and is the only place in the world with an extended fossils record of the early evolution of tortoises, dinosaurs and mammals. There are also important intangible elements, primarily the Bleek and Lloyd archive of Karoo folklore and its living counterpart. A number of sources support these claims:

- Academic: research programmes, dissertations, publications
- Museum collections and research
- Databases: at universities, museums and South African Heritage Resources Information System (SAHRIS)
- Sites that are the remarkably rich primary resource.

### *Discussion points after presentation*

- Absence of baseline information
- Many different sites build up a composite view: not all providing the same information
- In regard to fracking: we talk about 30 years but in terms of archaeology and palaeontology, we talk in terms of thousands and millions of years. Therefore: what is our legal responsibility within the context of these timeframes and in relation to future generations?
- Heritage in itself does not easily create jobs directly. But heritage attractions feed into local economy by drawing people who spend on fuel, accommodation, sustenance, etc.

## SITUATING SHALE GAS MINING IN THE STATUTORY AND STRATEGIC CONTEXT OF PLANNING AND ENVIRONMENTAL MANAGEMENT: PARADOXES, GAPS AND ANOMALIES IN GOVERNING NATURAL RESOURCES IN SOUTH AFRICA NEED AND DESIRABILITY – VALUE AND ATTITUDES

*Ms Tania Katzchner (School of Architecture, Planning & Geomatics, UCT)*

The presentation started with an image of a 'Mymer' (meditation) tent, which is part of the Snake Eagle Thinking Path geoglyph project in Matjiesfontein in the Karoo by Anni Snyman & the Site Specific team. Katzchner started with this image to highlight the importance of living thinking, paying attention to specific context in order to learn to care for and appreciate a particular environment. She further highlighted that art has a point of view and it deserves a 'seat at the table' - a critical task if we are to come to terms with life on a changing planet.

Re-positioning our relationship to energy services and practices (generation, demand, access and distribution) and natural resource management in association with the promotion of wellbeing of people and their places seems particularly urgent and important in South Africa. In the Karoo the challenge is exceptionally acute. Poverty, scandalous hidden hunger, continuing socio-economic disadvantage and inequality, and political fracture arising from colonial and apartheid legacies predominate in a region that is simultaneously one of the world's two most threatened arid biodiversity hotspots. This juxtaposition of extreme social need for development and extreme natural need for conservation is central to the strategic context for the consideration of shale gas mining in the Karoo.

Katzchner emphasizes the significance of grasping the current historical moment and contemporary Zeitgeist. We are at a crossroads moment in history that make us question the established reference points for understanding the world and acting in it. There is more awareness of the severe environment destroying externalities of our current production and consumption methods. In the Anthropocene an awareness of the effects of human history on natural history (and vice versa) has made it difficult to

continue to distinguish human actors from passive environments. We are living in an era of extreme hydrocarbon extraction, extreme weather events, and extreme economic disparity. We are in the midst of a great reawakening - a reawakening precipitated not by nostalgia for the past but by a sense of urgency about the future. All in all we are charged to find new paths. We are charged to remake the human presence on earth – rethink how we provision ourselves with food, energy, materials, shelter livelihood, transport and water. The task is to build pathways to sustainable energy and exercise responsibility and humility. We are currently stuck in a cul de sac and there is no option to maintain status quo.

Katzschner engaged the term sustainability and depicted the dire picture of environmental performance in South Africa. She argued that South African policy networks have paid insufficient attention to debating the theoretical and philosophical basis of these concepts and their implications for implementation. Despite the global and national commitment to sustainable development and environmental justice, evidence suggests that environmental injustices and lack of environmental sustainability persist. The socio-economic gains made currently in SA are at the expense of our natural resources. South Africa's poor environmental performance will likely have a direct impact on human development.

Linking environmental sustainability with poverty reduction and social justice, and making science and technology work for the poor have become central challenges of our time.

Katzschner highlighted some key aspects of current Land Management Systems in SA and changes over time highlighting some paradoxes, subtle changes and nuances (e.g. increasingly developer driven system). She portrayed the disjointed system of planning and environmental legislation. Currently no sector believes that we have an effective efficient environmental management system. This is particularly troubling considering that president Jacob Zuma in his State of the Nation June 2014 states that “we will pursue the shale gas option within the framework of our good environmental laws”.

She concluded with the question and challenge “Will fracking slip through virtually every means we have of making injuries visible, tracking them, compensating for them, and easing the substantial burden of future injuries?”

#### *Discussion points after presentation*

- It is unclear how the potential economic changes due to fracking will necessarily have a negative impact on the local communities – it could result in alleviation of current levels of poverty.
- Current high-density small stock farming has had extensive effects on the environment – fracking might have less of an environmental impact. Counter-argument: turning the Karoo into a Gauteng will definitely not have less of an impact.
- We cannot rely on one regulation tool when there are big issues in terms of space and time.

## **‘GIVE US EVIDENCE!’ WHAT DOES IT MEAN TO REQUIRE ‘EVIDENCE-BASED RESEARCH’ IN FRACKING DECISION-MAKING**

*A/Prof. Lesley Green (Department of Social Anthropology, UCT)*

Based on analysis of data published in scientific journals in regards to water management in the US fracking industry, the following areas of concern have been listed:

- stray gas contamination
- surface water impacts
- the accumulation of radium isotopes in some disposal and spill sites

However, despite the above-mentioned, there is the assertion that evidence was not enough for the scientific community to arrive at any conclusion about the negative impact of water management linked

to fracking. This demonstrates that the capacity of the scientific community to present data as evidence has been compromised by oil companies and, in some instances, environmental state agencies.

The following are examples where evidence is jeopardized:

- Regulatory agencies which are not geared for dealing with fracking issues
- Funding for university-based research provided by oil-companies
- IP laws about non-disclosure of some potentially harmful aspects of fracking (e.g. contents of fluids)
- Public communication backed by huge budgets
- Health: doctors prevented from informing their patients about cause of toxicity levels in their bodies
- Households where non-disclosure agreements in exchange for water
- Timescales as horizons of thought: e.g. obligations towards future generations; obligations towards different species; obligations towards the future of the earth etc.
- Economics (e.g. economics far more than simply referring to the fiscus and economy of the state).

*Discussion point after presentation*

- In regard to IP, the real issue is not the non-disclosure issue. It is the barrier created between information and scientific engagement with it.

## **PERSPECTIVES FROM PUBLIC HEALTH FIELD WORK**

*Ms Mieke Willems (Student, Department of Public Health, UCT)*

### *a. Background for study*

- international evidence pertaining to pollution as a result of fracking
- international evidence of health impacts due to fracking is increasing
- grass roots impact

### *b. Research questions*

- What are knowledge levels of Central Karoo residents (CKR) related to fracking?
- What do those who will be most impacted think about fracking and health?
- What are CKR health risk perception related to fracking and factors shaping these perceptions?
- What are CKR main information sources related to fracking?
- Do CKR trust government decisions related to fracking?

### *c. Findings*

- More than 70% consider fracking to pose a health risk
- Concern about water pollution
- Concern about lack of transparency
- 24% of participants trust government (\$\$)
- Main information sources TV, local newspaper

### *d. Challenges*

- Language barrier
- Low education level (lack of comprehension)
- Inconsistent levels of knowledge – level of survey (could be different between rural and urban)
- Distances between farms

*Discussion points after presentation*

- The disturbing factor is the lack of Shell engaging the very communities who will be affected by fracking.
- Study should be made available publicly.

## SESSION 3: INTERNATIONAL & REGIONAL PERSPECTIVES

### FRACKED URBANISMS: CRITICAL SPATIAL INVESTIGATIONS OF FRACKING IN THE USA AND UK

*Prof. Lindsay Bremner (University of Westminster, UK)*

Within the University of Westminster, architecture is placed within a triangle of energy, matter and data. This poses threat to traditional ideas of architecture as place, space and agency are interpreted differently. Fracking was taken to territorialize areas in a similar fashion as urban patterns: roads, infrastructure etc. prompted by fracking without any planning preceding it. It is not benign urbanism. What forms of life? What will make it habitable? These were the questions students needed to deal with.

1. How to make visible the impact of fracking. Seismic activity. How to monitor seismic activity below the earth.
2. Mapping project: the leaking landscape. Underground leaks. Map the pipes that connect underground. Exposed each owner of a well.
3. Colorado: conflict between agriculture and fracking.
4. Residential respirator: air quality and pollutants. Mainly from compressors after gas was extracted. Developed shrink-wrap for the house.

Student trip to Karoo: Extensive study of energy in RSA. What fracking would mean in the Karoo?

*Discussion point after presentation*

- What is missing in RSA context is land and ownership. Farming presented as inherently good. We need to think of land evictions, commercial farming etc. In SA, different kinds of usage of agriculture. The latter has almost become like neutral ground.
- These are just visualisation – difficult to believe that it can really work as was demonstrated in presentation.

### SHALE GAS ISSUE IN POLISH PERSPECTIVE: BENEFITS, RISKS AND QUESTIONS

*Adjunct Prof Dorota Rucińska (University of Warsaw, Poland)*

Poland's production of primary energy is based mainly on fossil fuels like coal, oil and gas. Of these, hard coal and lignite comprise 56% of the demand. As its energy sector still heavily relies on burning coal, clean coal technologies are being developed. Green energy and renewable energy sources, on the other hand, comprise 11.7% of its energy production.

Due to Poland's location and its history, national institutions are not adequately reformed to allow for better reliance on green energy. However, its reliance on imported gas from Russia has been affected by developments in Russia. Thus, while shale gas used to be not an option, there is now a demand for it as greater diversification of energy sources is pursued. As a result, in 2015 there will be a verification of shale gas resources in Poland. Due to the extensive use of water in shale gas extraction, the scarcity of water resources has attracted serious discussion. Fracking's impact on forests and agricultural land is also a matter of concern in addition to potential earthquakes.

In terms of legislation, several regulatory measures are in place to deal with the potential environmental impact. Poland also has to subscribe to the EU regulations due to it being a member of the EU.

In 2014, 16 companies were given concessions for fracking but the following rules apply:

- full transparency,
- careful choice of drilling sites,
- measuring and monitoring of environmental impacts,
- measures to prevent any leaks from wells into nearby aquifers,
- rigorous assessment and monitoring of water requirements and of waste water,
- measures to target zero venting,
- minimal flaring of gas,
- improved project planning and regulatory control
- engagement with local communities (Environmental Impact Assessment).

*Discussion points after presentation*

- There is awareness of the difficulty in assessing the benefits vs. risks vs. threat of shale gas exploration and extraction. One advantage, however, is that the Polish government is committed to environmental concerns and that planning is happening in consultation with the community. As a result, fracking does not occur on human settlements.

## **LOOK BEFORE YOU LEAP: A CAUTIONARY TALE FROM THE UNITED STATES**

*Prof. Melissa Powers (Lewis & Clark Law School, USA)*

*Discussion points after presentation*

- There are a number of reports showing that companies do not profit so much. In fact, some find it impossible to profit. This is more so in the light of decreasing costs of renewables particularly solar and wind. Due to a number of factors but also that there are many providers of shale gas and, therefore, large amounts of shale gas available for distribution.
- Reports of increased seismic activity in certain areas where fracking takes place, for example in Colorado. Clear correlation between the shale gas fields that are being exploited, and infrastructure for conventional sources of gas in particular pipelines.
- It is not clear what the long terms impact of fracking is going to be – especially as there are conflicting reports.

## SESSION 4: PERSPECTIVES ON SELECT BOOK CHAPTERS

### ENVIRONMENTAL ASSESSMENT IN THE MINERALS/GAS EXTRACTION CON TEXT: A CRITIQUE

*Ms Tracy Humby (University of the Witwatersrand)*

The presentation was structured around the following headings:

*a. Significance of environment assessment*

Environmental assessment is a constitutional right and should be based on firm environmental principles. The public should have a say in the development and implementation of an appropriate environmental assessment model.

*b. Model of environment assessment*

There is currently a regulatory framework although it is fragmented: the Mineral and Petroleum Resources Development Act (MPRDA) vs. the National Environmental Management Act (NEMA) vs. the National Water Act (NWA). To demonstrate the fragmentation: in regard to MPRDA, mining legislation provides the regulatory framework with the mineral authorities being the competent agency; within NEMA, on the other hand, environmental legislation provides the regulatory framework while the environmental authorities implement the legislation. Fracking sorts under the MPRDA, but the latter has not yet been fully developed for petroleum resources. Thus, legislation around fracking not fully in place yet. The ultimate aim, however, is to bring all the different sections into one environmental system. This implies that the implementing agency would still be based in a particular ministry (e.g. ministry for mining) but that appeals would eventually be the responsibility of one ministry (e.g. environment).

*c. State capacity to implement the framework*

In regard to the MPRDA, the environmental provisions are intended to be primarily implemented by the regional offices of the Department of Mineral Resources. However, the question arises as to whether they have the capacity, e.g. it seems inappropriate that one official could assess proposals. Within this context, the Centre for Environmental Rights (CER) has proposed that there should be an interdepartmental assessment team conducting this function. It is also not clear whether the training of the newly appointed EMRIs encompasses fracking. There are furthermore serious allegations of corruption again high-level government officials and these signals a lack of professionalism.

*Discussion points after presentation*

- There have been attempts to limit opportunities for appeals in South Africa due the pro-development and pro-mining approach by government departments dealing with environmental matters
- The acts for water control, oil and gas bills will take approximately three years to be approved. This would present more opportunities to scientists to engage with the fracking issue
- The really nice thing about the EIS system there must be a study about the base case. No point of reference of water quality before fracking in USA. But here we know. The potential for appeal is much bigger.
- Baselines shorten the time-frames dramatically
- EIS are not compulsory. The power to decide on that is with the local authority. No EIS authority at the local level in UK.

- Perhaps the ASSAf should be task to do the research. This will assist households if they would need to carry the cost of an appeal

## **THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (MPRDA): WITH SPECIFIC REFERENCE TO PETROLEUM RESOURCES**

*Dr Lisa Plit (IMEL, UCT)*

The MPRDA is the primary legislative enactment governing petroleum resources. However there is other applicable legislation, which is covered both in this chapter and the previous one. This also raises the question of co-operative governance.

Any discussion of petroleum resources must begin with a discussion of definitions, as it is critical to distinguish between mineral resources and petroleum resources.

This needs to be followed up with a brief look at the objectives of the Act. The long title of the Act provides a summary of these objectives, namely ‘To make provision for equitable access to and sustainable development of the nation’s mineral and petroleum resources; and to provide for matters connected therewith.’ Section 2 then elaborates on this, covering issues of sovereignty over resources, custodianship, equitable access, opportunities for historically disadvantaged persons, economic growth, security of tenure, the environmental right and sustainability as well as socio-economic development.

The heart of the provisions relating to petroleum exploration and production are to be found in chapter 6. The provisions relating to applications for and granting or exploration and production rights mirror those applicable to mineral rights, in chapter 4 of the Act. The chapter also addresses issuing of reconnaissance and technical co-operation permits and obtaining financial guarantees. Importantly the chapter also specifies that a designated authority be appointed to deal not only with the promotion of the sector but to make recommendations to the Minister about exploration and production right application. This provision requires further examination.

A number of the provisions in chapter 4 relating to issues like order of processing of application, transferability, assistance to historically disadvantaged persons, the applicability of the NEMA, environmental management, closure certificates, protected areas and compensation are specifically made applicable to the petroleum resources sector, by section 69(2).

There are also a number of provisions that apply to both mineral and petroleum resources which need further consideration and they are the provisions dealing with custodianship, the legal nature of rights and the payment of compensation as well as the question of expropriation. This is particularly relevant to existing landowners and their rights of ownership.

In addition to the Act, the department has also published draft technical regulations in terms of the Act, which are to regulate fracking operations. These need review.

Although the MPRDA is the primary enactment, petroleum resource exploration and production will fall into a wider regulatory framework, particularly legislation relating to water, the environment, biodiversity and protected areas. It may also be impacted by the Astronomy Geographic Advantage Act, as well as the Gas Act, and possibly the Constitution, should competing rights become an issue. Thus co-operative governance will play a significant role in the management of the sector.

In light of the potential effects of fracking, what is clear is that the legislative framework governing petroleum resources needs to be fully in place before any fracking-related activity could commence. But

before that even, we need to know about the unknowns to ensure the legislative framework is sufficiently comprehensive.

*Discussion points after presentation*

- If shale gas falls under petroleum activity, the question arises where does methane belong. Within this context, royalties are very important.
- South African legislation does not change fast enough so as to accommodate changes and new data
- Marine assets exceed land assets.

## THE KAROO: 'A SENSE OF PLACE'

*Prof. Loretta Feris (IMEI, UCT)*

Within the debate around fracking the concept of the Karoo as being a “sense of place” has strongly featured in opposition to fracking. It refers to human’s relationship with their biophysical space; their attachment to a specific place. But also closely link to social and economic issues as it equally signals reliance on this biophysical space.

Within the context of fracking in the Karoo, it is the erection of huge infrastructure, transport and the impact on the biodiversity, water resources, people, etc. that will change the way people deal with this landscape. How do we use “sense of space” from a legal perspective? In Australia, the courts ruled against the appeal of a company to mine through the opposition’s use of the concept of solastalgia, i.e. a sense of homelessness, sickness. It is essential that research be conducted to determine the extent of this happening in the Karoo. There is also a close connection to the heritage act and the act on protecting areas of significant historical importance.

However, the current arguments used by the anti-fracking activities are problematic – those who do it have done very little to alleviate poverty. Yet, fracking could alleviate poverty that is so rife in the Karoo. Therefore, what does “sense of space” mean to the poor who have lived in the Karoo for centuries? But will people have access to clean water; to energy etc.? These are difficult questions and demonstrate the inter-sectionalities of the different laws.

*Discussion points after presentation*

- Environmental education is a deficit in South Africa
- Because of huge inequalities in South Africa, there is a tension between talking about the rights of species and future generations vs. the impact of environmental pollution
- No one group of people are homogenous – many different voices among also among the poor

## SESSION 5: SUMMARY AND CONCLUSION

With regard to the purpose of the workshop, the following points were raised:

- Title of book and thread need to be clarified
- Draft of chapters to reach the editor (Jan Glazewski) by end November
- Chapters to be synthesized by the editor(s) during January and February 2015; possibly a workshop of editors in March; finalise thereafter; and manuscript presented to publisher by end June 2015
- Possible publishers could be the HSRC, Juta and the UCT Press
- Book is aimed at academics and will be peer reviewed
- In terms of covering the costs, it could be a handbook and also a compendium
- If book is aimed at obtain DHET subsidy, it needs to be peer-reviewed and research-based

The following provides a summary of the day's presentations:

### **ADVANTAGES OF SHALE GAS**

- Energy supply will be more stable
- Energy diversification which means less coal dependent (and less CO<sub>2</sub>)
- Economy will be strengthened as country will be seen as a place for investment
- Development through job creation etc.

### **DISADVANTAGES OF SHALE GAS**

- Its not a renewable resource
- Potential environmental impact is extensive (water pollution and supply)
- Negative impact on the landscape
- Negative impact on biodiversity
- Damage to heritage sites
- Impact on the Karoo inhabitants (health etc.)

### **REASONS FOR SCIENTIFIC ENGAGING WITH FRACKING**

- Within the South African context, it is a given that it will happen
- Due to limited knowledge about fracking in general, it is essential to engage with it scientifically
- Current science all US-focused – South African situation different
- No base-line data for South Africa

### **REASONS FOR OPPOSING FRACKING**

- Future generations adversely affected
- Earth-rights
- Threat to species' survival
- Shale gas is a non-renewable resource

### **REASONS FOR CONCERN ABOUT GOVERNMENT ENGAGEMENT WITH FRACKING**

- Fragmented approach (no inter-departmental approach)
- Legislation not taking into account all issues
- Limited public consultation
- Capacity to monitor and report

## APPENDIX A: PARTICIPANT LIST

| SURNAME       | NAME       | EMAIL ADDRESS                                                                              | INSTITUTION                                                   |
|---------------|------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| Baron,        | Jed        | <a href="mailto:j.baron@mywestminster.ac.za">j.baron@mywestminster.ac.za</a>               | University of Westminster                                     |
| Bremner,      | Lindsay    |                                                                                            | University of Westminster                                     |
| Calvert,      | Rupert     | <a href="mailto:r.calvert@mywestminster.ac.za">r.calvert@mywestminster.ac.za</a>           | University of Westminster                                     |
| Choo,         | Cheryl     | <a href="mailto:choocheryl@gmail.com">choocheryl@gmail.com</a>                             | University of Westminster                                     |
| Cook,         | John       | <a href="mailto:vecook89@gmail.com">vecook89@gmail.com</a>                                 | University of Westminster                                     |
| Dalvie,       | Aqiel      | <a href="mailto:aqiel.dalvie@uct.ac.za">aqiel.dalvie@uct.ac.za</a>                         | UCT                                                           |
| Davies,       | Ellen      | <a href="mailto:edavies@wwf.org.za">edavies@wwf.org.za</a>                                 | WWF                                                           |
| Ellyne,       | Mark       | <a href="mailto:ellyne.mark@uct.ac.za">ellyne.mark@uct.ac.za</a>                           | UCT                                                           |
| Elsdon,       | Lawrence   | <a href="mailto:le@elsdon.me">le@elsdon.me</a>                                             | University of Westminster                                     |
| Fakir,        | Saliem     |                                                                                            | WWF                                                           |
| Feris,        | Loretta    | <a href="mailto:loretta.feris@uct.ac.za">loretta.feris@uct.ac.za</a>                       | UCT/IMEL                                                      |
| Fuller,       | Sophie     | <a href="mailto:scm.fuller@gmail.com">scm.fuller@gmail.com</a>                             | University of Westminster                                     |
| Gasparrini,   | Marino     |                                                                                            | University of Westminster                                     |
| Glazewski,    | Jan        | <a href="mailto:jan.glazweski@uct.ac.za">jan.glazweski@uct.ac.za</a>                       | UCT/IMEL                                                      |
| Green,        | Nail       | <a href="mailto:nial.green@mywestminster.ac.za">nial.green@mywestminster.ac.za</a>         | University of Westminster                                     |
| Green,        | Lesley     | <a href="mailto:lesley.green@uct.ac.za">lesley.green@uct.ac.za</a>                         | UCT                                                           |
| Gwarbrick,    | Emma       | <a href="mailto:emmaruthswarbrick@gmail.com">emmaruthswarbrick@gmail.com</a>               | University of Westminster                                     |
| Hartley,      | Tristan    | <a href="mailto:t.hartley@mywestminster.ac.uk">t.hartley@mywestminster.ac.uk</a>           | University of Westminster                                     |
| Hartnady,     | Chris      | <a href="mailto:chris@umvoto.com">chris@umvoto.com</a>                                     | UMVOTO                                                        |
| Hedges,       | Mathew     | <a href="mailto:matthew.hedge@hotmail.com">matthew.hedge@hotmail.com</a>                   | University of Westminster                                     |
| Henschel,     | Joh        | <a href="mailto:henschel@saeon.ac.za">henschel@saeon.ac.za</a>                             | Southern African Environmental<br>Observation Network (SAEON) |
| Hillam,       | Jessica    | <a href="mailto:jessic-hillam@hotmail.com">jessic-hillam@hotmail.com</a>                   | University of Westminster                                     |
| Humby,        | Tracy      | <a href="mailto:tracyhumby@gmail.com">tracyhumby@gmail.com</a>                             | University of the Witwatersrand                               |
| Wakeford,     | Jeremy     |                                                                                            | University of Stellenbosch                                    |
| Kantor,       | Peter      | <a href="mailto:kantorp@iafrica.com">kantorp@iafrica.com</a>                               | Environmental Law Association                                 |
| Katzchner,    | Tania      | <a href="mailto:tania.katzschner@uct.ac.za">tania.katzschner@uct.ac.za</a>                 | UCT / Planning                                                |
| Khambhaita,   | Natasha    | <a href="mailto:ash@kham.co.za">ash@kham.co.za</a>                                         | University of Westminster                                     |
| Mcdonald,     | Oscar      | <a href="mailto:vis99361@mywestminster.ac.za">vis99361@mywestminster.ac.za</a>             | University of Westminster                                     |
| Morris,       | David      | <a href="mailto:dmorriskby@gmail.com">dmorriskby@gmail.com</a>                             | McGregor Museum Kimberley                                     |
| Ngaya,        | Manuo      | <a href="mailto:ngaya10@gmail.com">ngaya10@gmail.com</a>                                   | PhD Student UCT                                               |
| Palmer,       | Robin      | <a href="mailto:rpalmer@mokoro.co.uk">rpalmer@mokoro.co.uk</a>                             | University of Westminster                                     |
| Pang,         | Shiuefnee  | <a href="mailto:shiueene@gmail.com">shiueene@gmail.com</a>                                 | University of Westminster                                     |
| Papasolirion, | Anna Maria | <a href="mailto:a.papasolirion@mywestminster.ac.uk">a.papasolirion@mywestminster.ac.uk</a> | University of Westminster                                     |
| Petersen,     | Francis    | <a href="mailto:Francis.petersen@uct.ac.za">Francis.petersen@uct.ac.za</a>                 | UCT                                                           |
| Plit,         | Lisa       | <a href="mailto:laplit150@gmail.com">laplit150@gmail.com</a>                               | UCT/IMEL                                                      |
| Powers,       | Melissa    |                                                                                            | Lewis & Clark Law School                                      |

|            |          |                                                                              |                            |
|------------|----------|------------------------------------------------------------------------------|----------------------------|
| Rucinska,  | Dorothia | <a href="mailto:dmrucins@uw.edu.pl">dmrucins@uw.edu.pl</a>                   | University of Warsaw       |
| Steenkamp, | Lee-Ann  | <a href="mailto:lee-ann@outlook.com">lee-ann@outlook.com</a>                 | UWC                        |
| Thompson,  | Alice    | <a href="mailto:wis1710@mywestminster.ac.za">wis1710@mywestminster.ac.za</a> | University of Westminster  |
| Todd,      | Simon    |                                                                              | SAEON                      |
| Urquhart,  | Penny    | <a href="mailto:motswiri@iafrica.com">motswiri@iafrica.com</a>               | Independent                |
| Venter,    | Wilna    | <a href="mailto:wilna.venter@uct.ac.za">wilna.venter@uct.ac.za</a>           | UCT                        |
| Walker,    | Cheryl   | <a href="mailto:cjwalker@sun.ac.za">cjwalker@sun.ac.za</a>                   | University of Stellenbosch |
| Willems,   | Mieke    | <a href="mailto:miekewillems1@gmail.com">miekewillems1@gmail.com</a>         | UCT                        |
| Winter,    | Kevin    | <a href="mailto:kevin.winter@uct.ac.za">kevin.winter@uct.ac.za</a>           | UCT                        |

# APPENDIX B: SYMPOSIUM AGENDA

## UNIVERSITY OF CAPE TOWN

Shale Gas Working Group &

Institute of Marine and Environmental Law (IMEL)

*Symposium*

### Proposed shale gas mining/hydraulic fracking: A confluence of science, humanities, law and governance

Friday, 24 October 2014

SAB, Seminar Room Level 4, New Economics Building, Middle Campus

#### Objective of the symposium:

To air, identify and explore key issues around the proposed shale gas mining or hydraulic fracturing ('fracking') enterprise in the Karoo. Shale gas mining is regarded by some as being a potential 'game changer' for South Africa. However the proposal raises a host of issues of a multi-disciplinary nature that will be highlighted on the day including some international perspectives. Most, but not all, the speakers will be academics who have agreed to contribute to a chapter in a book provisionally titled: *Fracking/shale gas mining in the Karoo: critical environmental and governance perspectives. (Jan Glazewski (ed))*

#### AGENDA:

8.30 – 9.00 Registration/Coffee

|                                               |                       |
|-----------------------------------------------|-----------------------|
| <b>SESSION 1: SETTING THE SHALE GAS SCENE</b> | <b>(9.00 - 11.00)</b> |
|-----------------------------------------------|-----------------------|

*Chair: Mr Peter Kantor (Environmental Law Association)*

- |               |                                                                           |                                                                             |
|---------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 9.00 – 9.10   | Welcome                                                                   | Prof Francis Petersen (UCT Executive)<br>Prof Jan Glazewski (IMEL, UCT)     |
| 9.10 – 9.30   | Geo-physical context with particular reference to water and geo-hydrology | Dr Kevin Winter<br><i>Dept of Environmental &amp; Geographical Sciences</i> |
| 9.30 – 9.50   | The South African energy context                                          | Prof Jeremy Wakeford<br><i>Sustainability Institute, Stellenbosch</i>       |
| 9.50 – 10.10  | Setting the context: The book proposal, law, governance and beyond        | Prof. Jan Glazewski<br><i>IMEL, UCT</i>                                     |
| 10.10 – 10.30 | The Economics of Fracking                                                 | Saliem Fakir<br><i>WWF SA</i>                                               |

**10.30 – 11.00 TEA**

**SESSION 2: GETTING DOWN AND DIRTY**

**(11.00 – 12.30)**

**Chair: Prof Loretta Feris**

**11.00 – 11.20** Karoo Biodiversity Dr Joh Henschel/ Simon Todd  
*SAEON*

**11.20 – 11.40** Karoo archaeology & palaeontology  
Dr David Morris  
*McGregor Museum, Kimberley*

**11.40 – 12.00** Situating shale gas mining: need and desirability: values & attitudes  
Ms Tania Katzchner  
*Department of Built Environment, UCT*

**12.00 – 12.20** “Fracking” v “Shale Gas”: Perspectives from the Environmental Humanities  
A/Prof Lesley Green  
*Humanities, UCT*

**12.20 – 12.30** Perspectives from public health field work  
Ms Mieke Willems,  
*Student, UCT*

**12.30 to 2.00 LUNCH**

**SESSION 3: INTERNATIONAL & REGIONAL PERSPECTIVES**

**(2.00 – 3.30)**

**Chair: Prof Loretta Feris**

**2.00 – 2.30** Fracked Urbanisms: Critical spatial investigations of fracking in the USA and UK  
Prof Lindsay Bremner  
*University of Westminster, UK*

**2.30 – 3.00** Perspectives from the USA  
Prof Melissa Powers  
*Lewis & Clark Law School*

**3.00 – 3.30** Benefits, risk & questions raised in the shale gas issue:  
Perspectives from Poland  
Dr Dorota Rucinska  
*University of Warsaw*

**3.30 to 4.00 TEA**

**SESSION 4: PERSPECTIVES ON SELECT BOOK CHAPTERS**

**(4.00 – 5.00)**

**Chair: Jan Glazewski**

**4.00 – 4.15** Environmental Assessment in the minerals/gas extraction context: A critique  
Ms Tracy Humby  
*University of Witwatersrand*

**4.15 – 4.30** The MPRDA: with specific reference to Petroleum Resources  
Dr Lisa Plit  
*Researcher, IMEL*

4.30 – 4.45 The Karoo: 'A sense of place'

Prof Loretta Feris  
*IMEL, UCT*

4.45 – 5.00 General discussion

**5.00 – 6.00 Closure, drinks and snacks**

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