

Considering the technical readiness of South Africa to support the shale gas industry

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The discovery and exploitation of very large shale gas reserves in countries like the United States have transformed [the energy market](#). South Africa may also possess potentially large resources of shale gas. This could have a significant positive impact on the country's energy balance should it be decided to exploit these resources.



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The exploitation of these key energy resources might also have a significant social, economic or environmental impact while also presenting considerable technical challenges.

Given the recent challenges the country is facing in terms of [energy supply](#), the possibility of exploiting shale gas deposits for power generation is of current significance. Shale gas also presents other downstream opportunities. Some include providing a key resource for the production of liquid fuels and chemicals, or enabling the development of a domestic market for gas as a cleaner [energy resource](#).

Uncertainties

South Africa's Karoo region, in the south west of the country, is thought to have significant reserves of shale gas. Recently there has been considerable interest from the government and various companies like Shell, Falcon and Bundu to develop a shale gas industry there. [Considerable uncertainties](#) exist regarding the extent of these reserves and the geology at depths where they are typically found. These and other uncertainties and constraints include the following.

- The quantum of shale gas in the Karoo is still unclear: estimates range between [20 and 400 trillion cubic feet](#). None of these reserves has yet been proven.
- There are also constraints relating to geographical regions. For example, no fracking may take place in the vicinity of the [Square Kilometre Array station project](#). The project consists of the largest network of radio telescopes ever built.
- Ensuring that no hydraulic fracturing takes place at depths less than 1500m to protect groundwater resources will also reduce the geographical area of interest.
- Shale gas exploitation requires the use of relatively large quantities of water. Given that potable groundwater should preferably not be used for any such exploitation, greater clarity is needed on the availability of deep-level saline water.

This is considered to be acceptable for use in hydraulic fracturing.

- Baseline studies need to be carried out to ascertain with greater certainty the environment at depths greater than 3 km underground. Such baseline studies should also ensure that there is a clear understanding of the status of the human and natural environments before any fracking commences.
- South Africa has a serious shortage of the high-level skills that would be required to implement such an industry. Strategies need to be set in place to develop skills to ensure sustainable development of the shale gas industry.
- [International experience](#) has highlighted the critical need to have all the necessary legislative and regulatory structures in place. But also, a sufficient number of regulators with the required skills before a shale gas industry is launched.
- The implementation of a shale gas industry in an area like the Karoo may have a significant socio-economic impact on the local population. Similar concerns have been expressed in studies especially from [Canada](#) and [Australia](#). So it is important to ensure that there is a full understanding of the potential impact. Plans must be developed to manage them.

Resolution of these uncertainties requires extensive and ongoing consultation with all relevant parties. As such government has an important role to play as an honest broker of key information.

Risk and challenges

These uncertainties point to specific risks and challenges associated with the establishment of a shale gas industry in South Africa. This will require government to create an enabling environment to encourage investment in the industry while also ensuring that the state and local communities benefit. It is also critical that there is clarity regarding the pricing structures that may prevail. This is crucial when the industry begins to exploit the shale gas reserves, and obviously requires a clearer understanding of the potential quantum of the known reserves.

Establishing a shale gas industry presents complex technical and economic challenges, and implementation will require a whole-of-government [approach](#).

A structure at government level to facilitate and coordinate all the activities relating to the industry is recommended. This could coordinate the awarding of licences by various government departments and would have oversight of the activities of the regulators.

Awarding a production licence should proceed after satisfactory completion of terms associated with an exploration licence. This would require operators to demonstrate compliance of processes with legislation.

It is evident that before a shale gas industry in South Africa is implemented, important baseline studies need to be done. This will determine both the exact status quo prior to the commencement of a shale gas industry and the technical, social and economic consequences of such a development.

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