



Portfolio Committee on Energy (National Assembly)
Public hearing: *The draft Integrated Resource Plan 2018 (IRP)*

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submitted by: **Paul Lamberth**

qualification: **Petroleum Engineer (CEU 1980)**

organisation: **private individual**

The Rationale

Integration is the action of incorporating economic and social development so as to improve quality of life.

Resource is the supply from which a benefit is produced.

Plan looks to the future based on the past measured against actual.

The IRP does affiliate with the **Energy Mix** but does it comply with the **Energy Policy** gazetted in 1998, the **Integrated Energy Plan** (IEP) revised in 2016 and is it inline with the **2030 National Development Plan** (NDP)?

The general approach of policy is to recognise challenges, identify causes, find solutions, and implement them based on a plan.

To day, every aspect of social and economic intent is being redressed as government sets out on a path of growth, equality, and prosperity. This requires new and decisive thinking more specifically in the energy sector.

Problem Statement

The IRP is a decision making process concerned with the acquisition of least-cost energy resources, which takes into account the need to maintain adequate, reliable, safe, and environmentally sound energy services.

Coal will continue to play a role in electricity generation. However, investments must be made in new and more efficient technologies.

R50-60,000/kW

Clean Coal options such as *Underground Coal Gasification* must be promoted. UCG is an approach to energy production that allows for reduced emissions and other environmental impacts to be effectively managed. Stranded coal reserves, such as the Springbok Flats and others, can be included. **< R30,000/kW**

Power generation from *Nuclear* will play a role in the provision of new clean base-load generation. However, given the long lead-times associated with planning and construction, the *New Nuclear Build Program* must start now. **< R80,000/kW**

Problem Statement cont.

Natural gas presents the most significant potential for energy supply being ***the lowest least-cost resource***. The use of natural gas in the electricity sector (table 7), positions it as a viable option of the energy mix - 2026. Therefor local exploration to assess the magnitude of recoverable Shale Gas must be pursued in line with relevant regulations NOW. **R10-20,000/kW**

NOTE:

Substantiated **Fact** is that there is Natural Gas in the Karoo Basin. The resource requires exploration and the establishment of usable reserve.

Shale Gas can be exploited without harm to the environment. When water is scarce or unavailable the industry has developed methods using other incompressible fluids such as LPG, N₂, and CO₂. Propane well stimulation **NO WATER, NO CHEMICALS** with limited process water flow back (waste). To date, hundreds of wells have been stimulated using these techniques and is an accepted practice.

Problem Statement cont.

Biomass/gas must play a role in the provision of electricity close to the source. Municipal hubs eThekweni 8MW, Robinson Deep 3MW, Ngodwana 25MW, Mkuze 15 MW (planned) < R90,000/kW

Renewable Energy such as Solar PV, CSP with storage, and Wind present excellent opportunities to diversify electricity. However, RE is mostly asynchronous and is the least efficient (excluding hydro). Therefore, base-load support is required so as to insure grid stability. Until challenges are mitigated, sun and wind will remain "a nice to have". R30 - 40,000/kW

From studies made (CSIR, EPRI, etc.) various scenarios are presented. However, the recourse appears to be technically broad and therefore presents nothing new.

South Africa's challenges are unique and it requires something more meaningful that will put the country on a path moving forward...and not just following the *status quo*.

Fact:

- **South Africa is a world leader when it comes to coal power generation, with better efficiencies, cleaner emissions, and reduced water usage (air cooling).**



Medupi

- **South Africa is a world leader in Coal and Gas to Liquids Technology.**



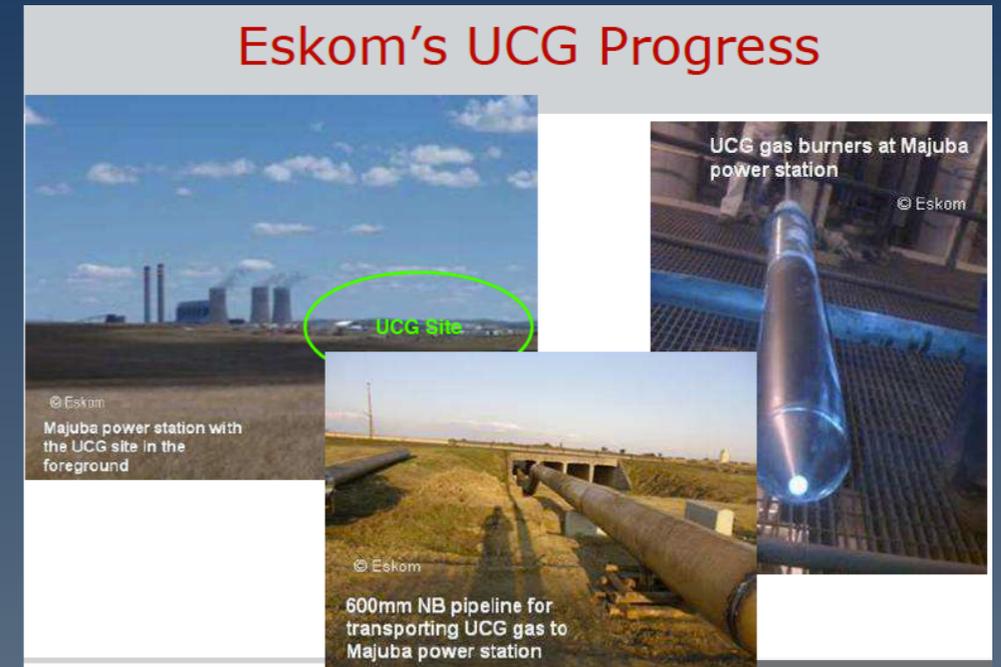
Secunda



150 MW Power plant

Fact:

- South Africa is a leader in Underground Coal Gasification technology as an alternative mining method, and a cleaner energy source. A 12 year Demonstration project by Eskom confirms viability and that it can be managed to prevent harm to the environment.



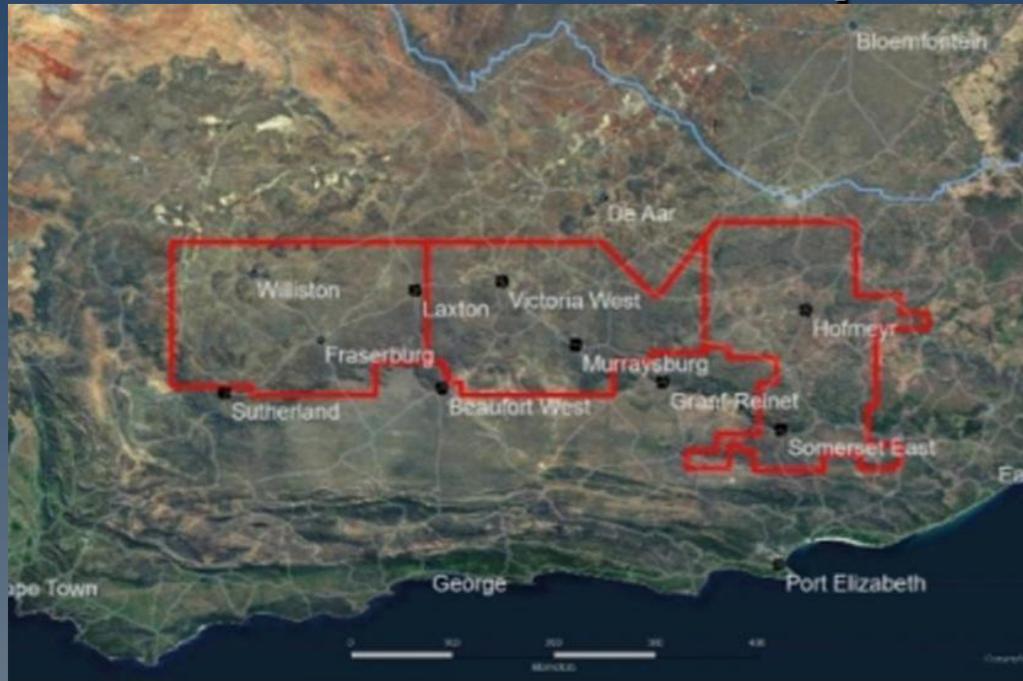
Majuba UCG

- South Africa is well placed in the Sciences and understanding of mining environment, and social development.

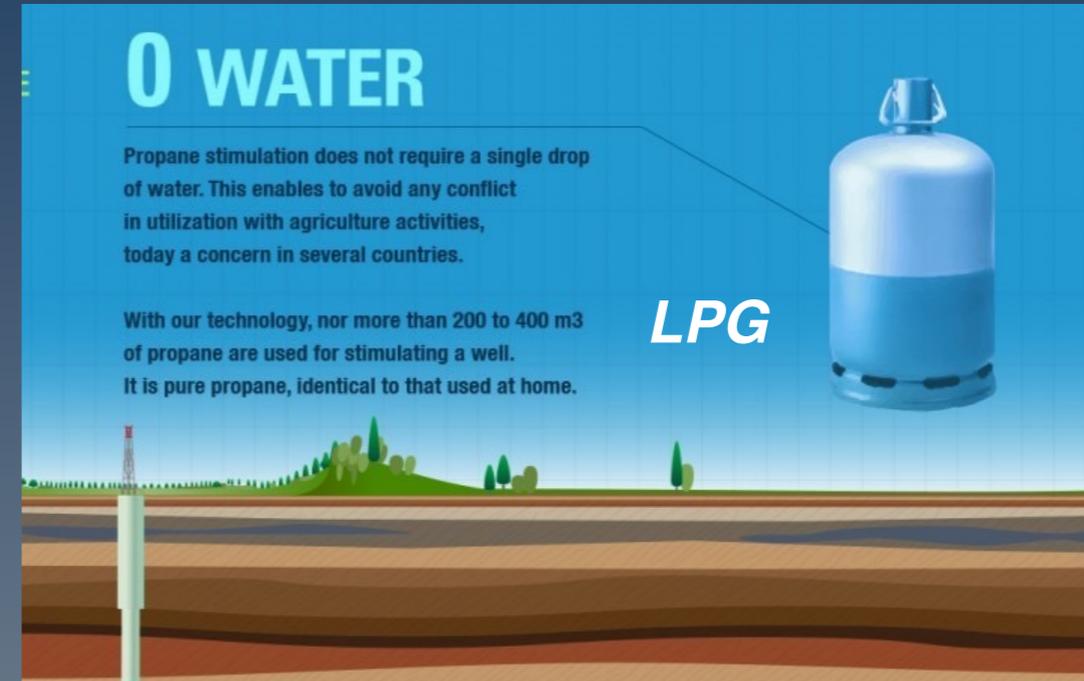


Fact:

- Besides sun and wind, South Africa has significant onshore Shale Gas resource which must be exploited.



Karoo basin



Alternative method

- South Africa has potential for Biomass power generation



Wood Chip



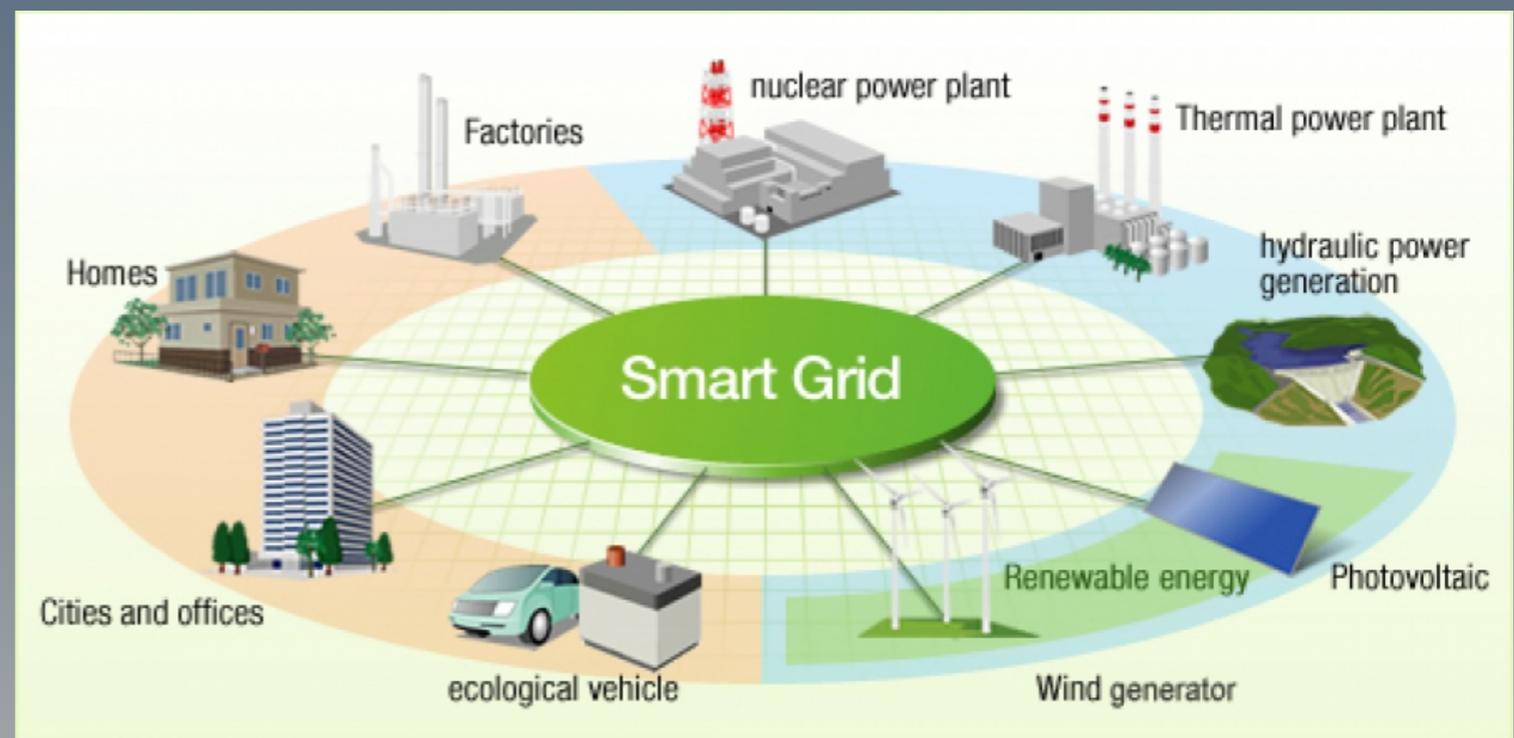
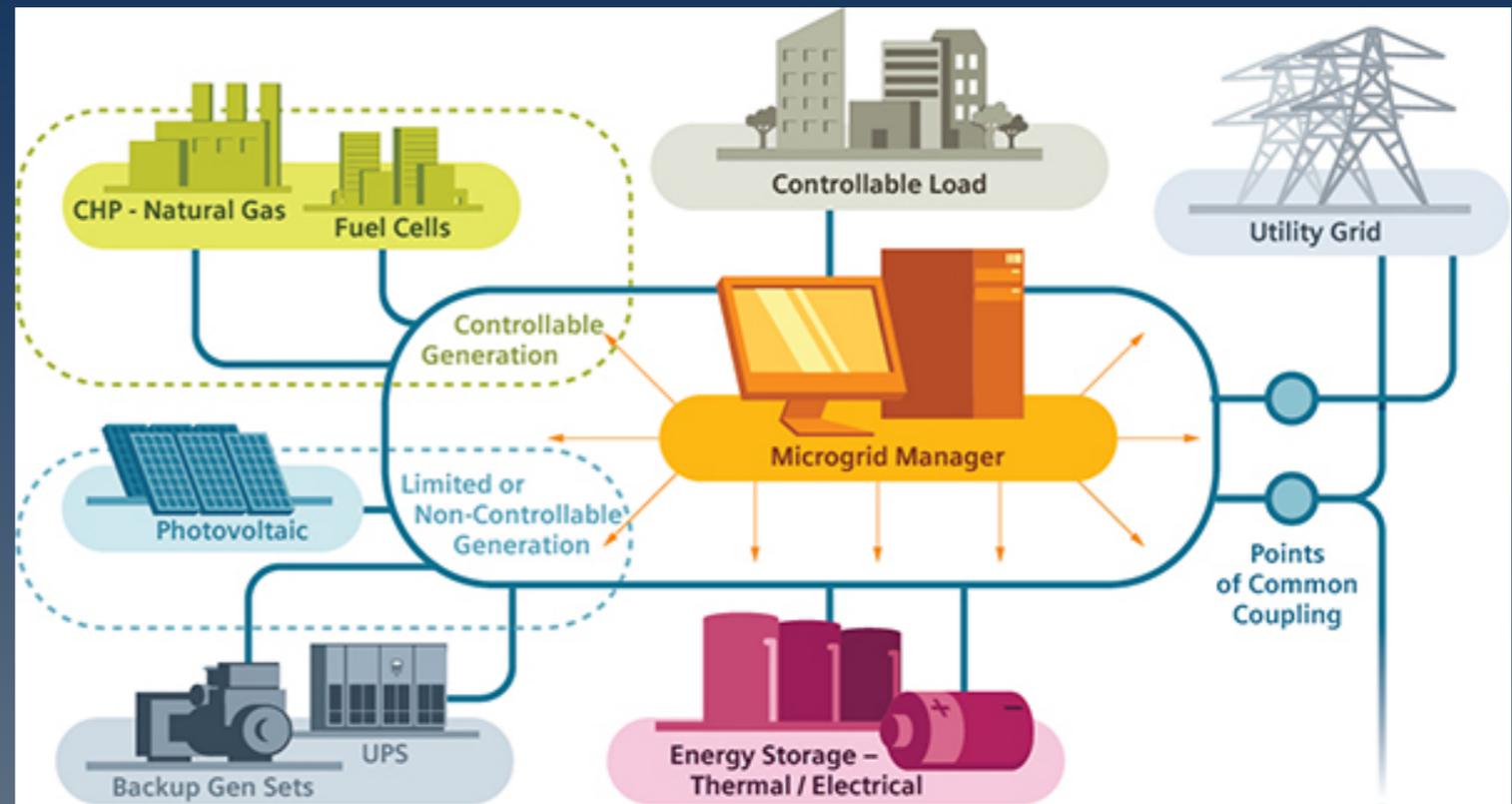
Sugar Cane waste



Fact:

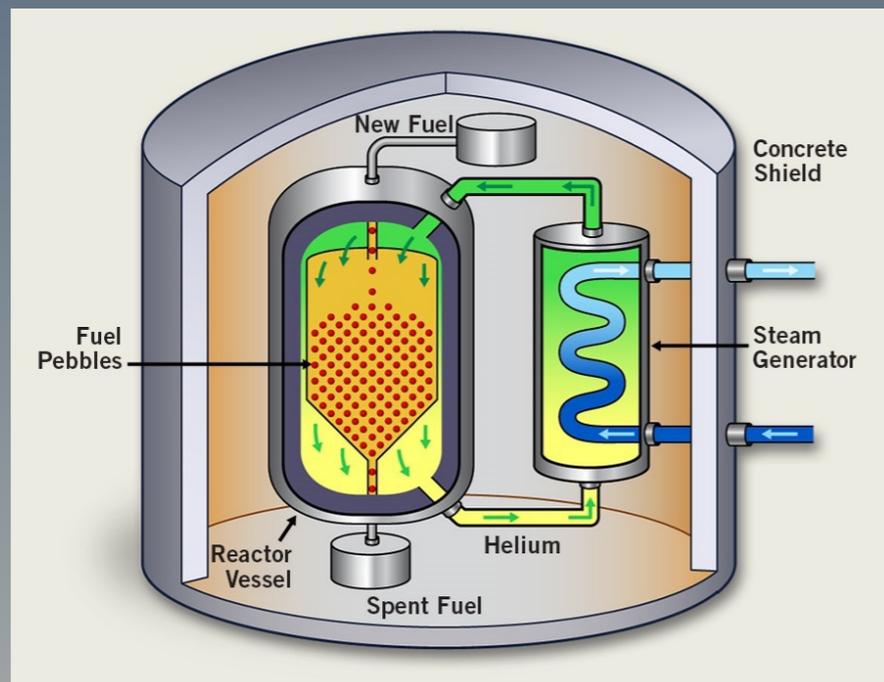
- South Africa is in the process of breaking away from Macro Grid towards Micro (island) Grid distribution which is cheaper, easier, less sensitive, and is more efficient (reduced line loss etc.).

- Smart Grid Systems must be considered as an alternative energy source and better management



Facts cont.

- With the discovery of natural Helium resource in the Free State, the Pebble Bed Modular Reactor (PBMR) which requires helium as a coolant can play a role in terms of future Nuclear Generation including down scaling reactor size (less risk, faster build) and follow the “French” approach. As South Africa is a leader in the development of PBMR technology this will realise a return on investment.



Pelindaba Research Center



Fact:

- **Containerisation (module form) is cost effective and must be added to the plan especially in rural areas...“plug & play”**



Modular Power Plant



Modular LPG Plant

- **Automation, simulation training, data management, reduces human error (risk), provides better and safer working environment. Reduces skill development time creating more and better jobs for youth and women.**



Fact:

- The Southern African power pool (SAPP) set up by SADC. South Africa can use surplus capacity to assist other countries that cannot meet their own electricity demands. This will create benefit by reducing cost, utilise stranded assets and a better investment climate.
- South Africa has specific legislation in place so as to safe guard environmental harm and insured equality leading to a better life (Mining Charter).

In Conclusion

Energy security is a pre-requisite for achieving economic growth. From the **FACTS** presented the development of South Africa's electricity infrastructure can contribute towards ensuring economic growth and development as envisaged in the **2030 National Development Plan**

The plan needs to be revised today for tomorrow using research, studies, and investment. This will insure **"uncertainty"** will become a reality and substantiate a **"LIVING PLAN"**.