



Annual Energy Crisis Discussion Forum

Concept Document

24-25 April 2024

The South African state has a legal obligation to provide energy on a national scale to its citizens, but it has become increasingly clear that the state is unable to do so, universally and consistently. Sources of electricity remain constrained to such an extent that it would take many years to restore and expand the system sufficiently. Yet the government has been addressing the crisis in various ways, and a new Integrated Resource Plan: [IRP Government Gazette 2023.pdf \(energy.gov.za\)](#) has been published. While the government focuses on national power supply, transmission and distribution, various initiatives address the energy crisis at a more local level.

At this online NSTF discussion forum, we hope to get an update on the latest developments at a national level, and discuss:

- The new Integrated Resource Plan (IRP)
- The Just Transition to renewable sources of energy
- Skills and upskilling

At a more localised scale, information and knowledge will be shared including the following:

- The opportunity presented by the Department of Trade, Industry and Competition (dtic)'s eco-industrial parks to contribute to the renewables industry and integrate renewable sources into their operations
- Small Modular Reactors (SMRs) for localised power supply
- Hydrogen fuel cells for localised power supply
- Biodigesters for local community use
- Microgrids

Purpose and objectives:

This Discussion Forum provides a platform for scientists, professionals, government officials and the public to share their insights about the current state of energy provision in SA and the more localised solutions that have been devised.

1. What do scientists and professionals have to say about the current state of energy provision?
2. What plans are there to provide the skills needs for the roll out of renewable energy?
3. What local solutions hold promise for overcoming the energy crisis, and which of these should be scaled up?
4. What are the impacts and implications of consumers devising their own power solutions?
5. Are we making progress?

Background

Previous discussion forum: The [Transitions in South Africa's energy provision online discussion forum](#) took place from 22-23 August 2023.

Speakers from government, industry associations, academia, and energy companies were brought together to present the challenges to and opportunities for powering SA fairly, sustainably and economically.

Various transitions are needed simultaneously: the transition from over-reliance on fossil fuels to embracing renewables, a just transition that will minimise the harmful effects of dramatic change, and involves the entire economy, transitions to unique and innovative solutions, and to greater efficiencies. By its very nature, technological change is disruptive – of society, economies and countries. SA's institutions, researchers and leaders are guiding the country through these transitions – and although it is a challenging journey, there are competent and well-intentioned people working on this.

The key themes that emerged were:

- The need for a transition that is economy-wide
- The need for technological innovation and efficiencies
- challenges with existing infrastructure and grid constraints
- reducing emissions in the context of climate change; and
- the strong move to renewable sources of energy

Those who propose a swift and dramatic transition argue that it would enhance access to capital, enhance trade competitiveness, increase geopolitical influence, reduce the impacts of climate change and other related environmental issues like water, and reduce the impacts of air pollution. This has huge implications for how we think about the economy. (Steve Nicols, PCC) How does the transition to renewables give access to capital and enhance trade competitiveness?

Mr Norman Moyo emphasised a need to recontextualise the electricity issue in terms of broad economic reforms required: "Addressing the energy situation offers a fresh economic opportunity to revitalise the continent's economy. What opportunities does this crisis present? It promises energy security and stability, affordability, and the crucial decarbonisation of the economy, starting with a reliable energy supply." What new economic opportunities are presented by the renewables industry?

Context update

The country continues to battle a severe energy crisis marked by frequent and extended blackouts that can last for hours, days or weeks. The government is facing enormous pressure to address this crisis and mitigate its impacts on the country's economy, social well-being and overall development of the state. The Department of Mineral Resources and Energy (DMRE) has published the updated and revised Integrated

Resource Plan (IRP) in 2023. The plan focuses on providing secure energy/electricity supply to all SA citizens as well as balancing the supply and demand of energy resources. Energy sources include coal, hydro power, gas, nuclear power, renewables, hydrogen and storage. There has been some development since the last IRP was issued in 2019, which includes the establishment of the [Presidential Climate Commission \(PCC\)](#) and the [Energy Action Plan](#). There are many issues that remain to be addressed, including the lack of skills in the economy and upskilling of retrenched workers.

The energy industry is evolving at a very rapid pace, hence the NSTF's focus in 2023 on Transitions in energy provision. There is a need for skilled engineers and other professionals who can implement, develop and maintain advanced energy technologies. The government has enforced strict rules on reducing carbon emissions and the intention is to include nuclear power and renewable sources of energy such as wind farms and PV solar panel arrays in the energy mix, as well as constructing advanced power grids. These projects demand a specialised workforce with expertise in different fields such as various scientific disciplines, branches of engineering, and environmental sciences. A shortage of proper expertise can lead to an even more restrained economy, increased costs in maintaining the supply and distribution of energy and challenges in reaching all the sustainable development goals (SDGs). This means that we need to focus on education, training and research. Young minds should be provided with a variety of opportunities to learn and be employed in order to improve our energy systems, and that includes innovation.

The strain on the electricity system and the lack of reliable service delivery have led to people resorting to taking alternative measures. Because energy supply is not stable, many individuals in local communities are now actively reducing their dependence on municipal electricity provision by integrating solar energy into their supply and using battery power for energy storage. These developments hinder the revenue generation of municipalities as they largely depend on revenue from municipal bills which include the provision of electricity. Even with the shift to solar energy supply, energy poverty is still very prevalent in SA because of the high costs of roof-top solar and the inability of most consumers to afford it.

Issues with renewable energy sources include:

- Low efficiency and low electricity generation capacity - Renewable sources are still new to the market and they are not yet efficient in generating electricity to a large population. There is also a lack of skills to install, maintain and improve on these and to advance them in a way that would be more efficient.
- They take up space – Even when solar farms are erected in arid areas, they can interfere with farmers' plans for grazing livestock and game. Wind farms interfere with birds' flight patterns and migration.
- Reliability - Wind and solar energy sources are highly reliant on weather conditions. Although SA has plenty of both wind and sun, energy from these sources needs to be stored. The amount of electricity fed into the national grid from variable sources should be carefully managed to work optimally.
- With the climate change currently experienced by SA, hydropower becomes increasingly unpractical as a reliable source of energy.

What can be done?

It is a complex task to integrate renewables into the electricity supply. There needs to be a strategy that considers technological innovation and research, policy support, upskilling and investment in infrastructure. Developments in technology allow complexity to be managed more efficiently. Consideration should be given to implementing a country-wide high-tech system that can lead to reliable electricity provision to industry, business and communities.

Another sustainable solution is reducing consumption. For some areas in SA a strategy has been adopted of minimising the energy load in their areas to avoid power cuts. Energy efficiency remains a very important goal.

During the two-day discussions, we will unpack each of the issues mentioned and come up with possible solutions to create sustainable and stable energy provision.

Themes

1. Electricity policy update
2. Locally generated electricity
3. Management systems
4. Household energy solutions
5. Skills and upskilling

Outputs

As is usual for [NSTF Discussion Forums](#), a media release will be issued which summarises the most important issues and conclusions. The following outputs will also be made available on the [event page](#) and through social media platforms ([Facebook](#), [Instagram](#), [X](#), [YouTube](#) and [LinkedIn](#)):

- Video recordings of speakers' presentations (subject to the speakers' agreement)
- Presentation slides (if available and subject to the speakers' agreement)
- Speakers' biographies document
- Useful links (Feel free to let us know should you have any information that you would like us to consider posting here.)
- NSTF will engage the media on possible interviews and/or articles, and post on social media before, during and after the event.

References

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