

# Panel discussion Beyond IRP 2024: Reforming long-term electricity planning in South Africa

Summary

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## Panelists



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## Moderators



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# Background

The most recent draft of South Africa's Integrated Resource Plan (IRP 2024), currently under review at NEDLAC, has faced widespread criticism from industry experts and stakeholders. Strengthening South Africa's IRP process is essential for ensuring economic stability, energy security, and environmental sustainability. A well-designed, transparent, and credible IRP provides a clear pathway towards a reliable, affordable, and sustainable energy future. Conversely, a flawed or opaque plan risks worsening load shedding, undermining investor confidence, and causing further environmental degradation.

The SAAEE held a panel discussion on the 25th of March 2025 to critically assess the shortcomings of the current process. This was followed by practical recommendations from the panel on how the process can be improved to enhance credibility, transparency, and stakeholder buy-in for South Africa's long-term electricity planning

## **The key questions that were discussed include:**

- Are the criticisms highlighted by stakeholders warranted?
- As South Africa transitions to a wholesale electricity market will IRP still be needed? If so, why and how might the role of the IRP and IRP process change?
- How can South Africa's long-term electricity planning process be improved?
- What role should the Ministry of Electricity, and private and public sector stakeholders play in ensuring the development of a more effective and credible IRP?

Key outputs from the IRP Discussion:  
Session 1. Challenges and shortcomings of  
the IRP process

# Key outputs from the IRP Discussion: Session 1 (1/3)

This session focused on critical shortcomings of South Africa's draft Integrated Resource Plan (IRP). Key themes included methodology transparency, scenario planning, energy security, and institutional process weaknesses. Below is a consolidated summary of the key points:

## 1. Demand Forecasting and concerns of overestimation

The IRP has historically produced unrealistically optimistic demand projections suggesting demand would grow exponentially when the reality is that there has been a trend-decline in the demand for grid-supplied power in response to rising real prices, slow economic growth and falling energy intensity of growth. However, despite the very optimistic growth forecast, slow procurement of the capacity outlined in previous IRPs and declining performance of the existing coal fleet has meant that South Africa has still faced severe supply shortages.

Some of the speakers maintained that while over-forecasting demand (if it translates into overinvestment in capacity) could result in a costly surplus of supply and drive-up electricity prices in the short-to-medium term, recent experience had shown that the cost of under-supply (e.g. load shedding) is far more damaging economically and socially. One speaker noted that there may be latent demand, that has been suppressed due to unreliable supply over the past few years (e.g. electrification growth, grid constraints), and that as such the trend decline in sales may reverse. Experts agreed that the use multiple methods, frequent updates to forecasts (e.g. annual) and transparency about key assumptions boost the credibility of demand projections.

## 2. Methodological transparency and documentation flaws

A major concern is the lack of transparency in how the IRP models were built and how decisions were derived. Key methodological elements, like how reliability standards are met or how scenarios translate into policy, are not explained. The "emerging plan" appears disconnected from the scenario results, with no clear decision rule (e.g. least regret, expected value) linking analysis to action.

Panellists called for publishing the underlying assumptions, datasets, and full modelling logic (e.g. assumptions books or simplified public models), and that the capacity planning and model inputs be made publicly accessible.

# Key outputs from the IRP Discussion: Session 1 (2/3)

This session focused on critical shortcomings of South Africa's draft Integrated Resource Plan (IRP). Key themes included methodology transparency, scenario planning, energy security, and institutional process weaknesses. Below is a consolidated summary of the key points:

## 3. IRP scenario design and uncertainty handling

- Current scenario narratives are underdeveloped. There's inadequate explanation of scenario purpose (e.g. what is the reference scenario?), treatment of fuel prices (like gas), or demand uncertainty. Scenarios should explicitly explore upside/downside risks and guide decision-making under uncertainty.
- Additionally, there's no clear plan for what to do if critical risks materialise – e.g., gas supply delays or transmission grid underbuild.

## 4. Energy security standards not defined or upheld in the latest IRP

One speaker noted that the IRP's primary stated goal is energy security, yet it fails to define or uphold a clear energy security standard. The security of supply threshold outlined in the Energy Security Master Plan (2007 to 2025) was that the reserve margin should be maintained at a level where the marginal cost of adding the next block of capacity is less than or equal to the monetary value of the load-shedding it avoids (often calculated using the Value of Lost Load).

The 2007 analysis had suggested that assuming that the economic cost of load shedding (unserved energy) was R75/kWh the optimum reserve margin would be maintained at approximately 19% as the incremental costs of providing a reserve margin of above 19% would not justify the cost of unexpected un-served energy eliminated. Interesting enough a 19% reserve margin would also satisfy the US reliability standard of "1 Day in 10 Years"

*Note: Reserve margin is defined as spare system capacity above system-wide peak demand. A 19 % reserve margin means the system keeps about 19 % more firm generating capacity than the highest demand it expects to face.*

# Key outputs from the IRP Discussion: Session 1 (3/3)

## 5. Transparency and process lessons from other sectors

- The telecoms sector (ICASA) offers a model for transparent, iterative regulatory processes: (i) Models and assumptions are made public, (ii) stakeholders submit data and challenge inputs, and (iii) there are multiple iterations of consultation, with published responses to feedback.
- Such transparent, contested processes are seen as essential in high-stakes, high-cost sectors like electricity.
- Stakeholders expressed frustration that inputs and objections are often ignored, and that the IRP lacks formal mechanisms for incorporating and responding to feedback

## 6. Outdated data and modelling cadence

The IRP uses outdated input data (e.g. 2017 demand data), undermining its relevance. Stakeholders strongly urged that the IRP become a live document, updated annually to reflect changing costs, technologies, and system dynamics. Comparative examples (e.g. Abu Dhabi) show how well-resourced planning teams (15–20 dedicated staff) support frequent, robust planning cycles.

## 7. Concerns about gas, grid, and renewable constraints

The current IRP heavily favours gas additions in 2028–2029 while restraining utility-scale renewables. Participants questioned whether this was justified given (i) uncertainty in gas availability and import infrastructure readiness, (ii) emerging technical solutions (e.g. curtailment, storage, grid support technologies) that can better integrate renewables. Some experts believe renewables are being unnecessarily constrained in favour of fossil-fuel technologies.

Key outputs from the IRP Discussion:  
Session 2. Recommendations on practical  
steps that could be taken to improve the  
process

# Key outputs from the IRP Discussion: Session 2 (1/3)

The second session provided insight into a few of the practical steps that could be taken to improve the process. Recommendations by panellists included:

## 1. Strengthening the transparency of the IRP process and improving the public engagement process.

For example, all modelling assumptions, demand forecasts, and cost estimates should be published to allow independent review and validation. One participant suggested an independent Energy Planning Advisory Council with experts from industry, academia, and civil society could be established to provide oversight.

## 2. Reducing political interference and strengthening governance structures.

South Africa could establish a more independent entity responsible for energy planning. A more arms-length model that would insulate planning body from direct political influence, allowing for evidence-based decision-making that is driven by technical expertise rather than short-term political considerations. For example, in Australia, the Australian Energy Market Operator (AEMO) is directed by energy ministers and the Australian Energy Market Commission to carry out specific planning tasks, notably the biennial (once every two years) Integrated System Plan (ISP). Australian energy ministers still set the high-level policy goals (e.g. emissions targets, renewable-energy share, reliability standards). Those goals are written into statements of expectations, regulations or legislation. AEMO must use those goals as boundary conditions in its modelling. In addition the government owns a majority stake in AEMO and appoints the chair and most of the board and approve its constitution and budget. In short, while AEMO operates at arm's length, it is not a completely separate, private-sector body.

# Key outputs from the IRP Discussion: Session 2 (2/3)

## 4. Strengthening independent oversight

Similarly independent oversight of the IRP process should be strengthened. For example, the AEMO's Integrated System Plan (ISP) has several layers of independent, statutory oversight written into the National Electricity Rules (NER) provided by the Australian Energy Regulator. For example, the AER publishes Cost Benefit Analysis Guidelines and Forecasting Best-Practice Guidelines the AEMO must comply with. An independent Expert Panel (IEP) is required to reviews the draft ISP's inputs, models and results from a technical perspective (generation mix, transmission path, demand forecasts, cost assumptions) . The IEP is appointed by the AEMO from a standing list but operates at arm's-length and publishes a public report on whether the draft ISP is reasonable and where it should be improved before it is finalised. A Consumer Panel. Provides independent advice on whether the ISP is in the long-term interests of consumers. There is also a broader stakeholder consultation process.

## 5. Improve demand forecasting and scenario planning.

Improving demand forecasting by employing more than one approach - "top-down" and "bottom-up" since both have drawbacks/advantages over different time horizons. For example 'top-down' econometric models are well suited for long-term forecasts that incorporate downside influences on demand such price elasticity and energy-intensity of growth.

Panellists noted that the ability to update low, high and baseline forecasts regularly (e.g. annually) is important. through more accurate and updated models, similar to those used internationally, is crucial. Additionally, given the rapid evolution in technology performance and costs, the models should be run more frequently (e.g. annually) and with greater transparency of inputs and methodology. The latter will serve to bring greater legitimacy to the process.

## 6. Ensure accurate and transparent cost modelling.

Adopting a more rigorous and transparent cost modelling process that can be supported by independent expert reviews. Public access to cost assumptions and breakdowns, including a detailed analysis of both capital and operational expenditure, will allow stakeholders to better understand how cost estimates were derived.

# Key outputs from the IRP Discussion: Session 2 (3/3)

## 7. Incorporate economic costs and benefits.

Similar to Australia's ISP or China's transmission planning, South Africa could integrate CBA for transmission and infrastructure planning, factoring in the economic costs of different energy options, including renewables, storage, and conventional generation. Beyond direct costs, the IRP could also include socio-economic benefits of different energy options, including job creation, rural development, and energy access, ensuring that the IRP is not just technically sound but also socially beneficial.

## 8. Improve coordination between generation and transmission planning.

Why? Because an Integrated Resource Plan (IRP) that optimises only the mix and timing of new generation can look least-cost on paper, yet prove unbuildable or far more expensive once the transmission network needed to deliver that generation is costed and approved. Generation expansion and network expansion should be planned to minimise total system cost (capital + operating + congestion + reliability), not their individual silos. Improved coordination means treating generation and transmission as a single optimisation problem, governed through aligned timelines, shared data and co-optimised modelling.

# Additional takeaways

# Additional key takeaways

- Given the age of our coal fleet (average age exceeding 40 years) and the recent history of unserved energy (load shedding), we are not in a position to make any trade-offs – we must do all that is practically possible to ensure energy security.
- The cost of undersupply (load shedding) far exceeds the cost of oversupply by multiple orders of magnitude. While demand forecasts remain crucial, agonising on their precise accuracy has diminishing returns in our current context.
- The combination of a network with suppressed demand (due to load shedding which prevents consumers from using the energy they would otherwise consume) and an economy that has latent demand (potential future demand if supply constraints are relieved) makes the risk of “oversupply” very low.
- The term “over-build” does not have a solid conceptual basis and may not be useful for practical discussions. Rather consider that the capacity is “built early.” This is especially relevant given our latent demand (and actual demand will eventually catch up).
- The function of the IRP will have to be reconsidered given the establishment of an open market platform. The IRP will eventually cease to be prescriptive but will be “indicative” for capacity additions where the operator anticipates capacity gaps.
- Much is said about the need for “independent verification” of the modelling. But independent from whom?

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