

Should Energy Intensive Users have such a large say in Energy Discourse?



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In 2011 the South African government adopted an Integrated Resource Plan (IRP). The IRP is aimed at providing guidance in relation to investment in the electricity sector in the next 20 years, i.e. between 2010 and 2030. The total new generation capacity less decommissioning in the IRP amounts to about 41340 MW which will be sourced from coal, nuclear, imported hydro, Closed Cycle Gas Turbine (CCGT), Peak Open Cycle Gas Turbine (POCGT), wind, Concentrated Solar Panel (CSP) and Solar Photo Voltaic (Solar PV). These technologies will contribute in the energy mix as follows:

Technology	Proportion	Share of new capacity in %
Coal	6300MW	15%
Nuclear	9600MW	23%
Hydro (Import)	2600MW	6%
Gas: CCGT	2400MW	5%
Peak: OCGT	3900MW	9%
Renewables	17800MW	42%
Wind	8400MW	
CSP	1000MW	
Solar PV	8400MW	

Adapted from IRP2010 Document

South Africa's main sources of electricity so far have been coal and nuclear. Currently coal constitutes 90% of the country's source of electricity and nuclear 5%. The IRP aims at reducing the share of coal in South Africa's electricity generation from 90% to 65.5% whilst increasing the nuclear share from 5% to 20% by 2030. The renewable sources of electricity will contribute 9% of electricity generation by 2030. This means that the share of coal would have decreased by 27.2% and that of nuclear increased by a massive 300% by 2030. Initially, the IRP was proposing 11400MW for renewable sources of electricity. This was ultimately increased to 17800MW after consultations.

The current total installed generation capacity in the country is about 44000 MW. So government has decided to double installed generation capacity through the IRP.

Is there a Need for Such a Massive Investment?

Government's main objective through various policy interventions is the creation of decent jobs. South Africa has one of the highest unemployment rates which have not fallen below 20% in the past 20 years or so¹. This means those who are working have a responsibility to take care of the millions who are unemployed.

It is in this context that government has adopted policies like the Industrial Policy Action Plan (IPAP) and the New Growth Path (NGP). The NGP aims at creating 5 million new jobs by 2020. In order to create the productive capacity in the country, and therefore reverse the challenge of de-industrialisation, there is a need to invest in the energy sector.

Not surprisingly, therefore, the main reason given for this massive investment in the electricity sector is to ensure security for the supply of electricity. 'Investors need certainty in the security of supply' is a common refrain. Surely, this sounds quite reasonable. The country needs investment in the economy, particularly in relation to the manufacturing sector which is the engine of growth.

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However, does the country need this massive investment to achieve the noble objective of creating jobs in the economy? If we all agree that, indeed, the country needs this huge investment, then the next questions are whether the energy mix is optimal? Who will foot the bill for this investment? Which sectors of the economy need this massive investment?

Electricity Consumption by Sector in South Africa

On aggregate the business sector (primary, secondary and tertiary) consumes 69.9% of the electricity compared to a mere 17.2% by residential consumers². These figures can be broken down further as follows:

- Industrial sector: 37.7%
- Mining: 15%
- Commercial sector: 12.6%
- Agricultural sector: 2.6%
- Transport sector: 2.6%
- Domestic sector: 17.2%
- General: 12.3%

The manufacturing sector accounts for about 15% of national output and consumes close to 40% of electricity in the country. This sector is currently dominated by petrochemicals and basic iron and steel industries. The South African economy is still dependent on the upstream energy-and-capital intensive sub-sectors whose products are directly exported with few forward linkages with the domestic economy. These sub-sectors are basic chemicals, other chemicals and man-made fibres, basic iron and steel, basic non-ferrous metals, paper and paper products and coke and refined petroleum products.

The Beneficiaries of the Investment

The upstream, energy-and-capital intensive sub-sectors are the ones that stand to benefit massively out of more than double the new generation capacity being created. This should not be surprising because out of 16 members of the IRP technical task team members, about 40% of them came from the Energy Intensive Users Group (EIUG), namely, Xstrata, Anglo American, Exxaro, SASOL, BHP Billiton and Chamber of Mines³. The EIUG consumes about 44% of the electricity sales in South Africa⁴.

While Eskom's System Operator did modelling work for the IRP, it would be difficult to understand how the EIUG, which served on the technical task team, did not bring its weight to bear on the final document.

Business was opposed to this approach and argued for an opportunity for customers to utilise new additional suppliers of power. They argue that this would create a strong incentive for investment in additional and efficient power generation.

While the major concern is security for the supply of electricity, it does happen that at times supply may exceed demand. In that eventuality, some of the power stations will have to be mothballed, as happened with Eskom's power stations in the 1980s. Unfortunately, returning those power stations back to service does not come about cheaply, money is needed for de-mothballing. The question is who would foot the bill for de-mothballing those power stations? As it happened when Eskom returned the power stations it had mothballed back to service, the electricity tariffs would have to be increased massively.

One of the cheapest ways of making electricity available for the economy is to use electricity efficiently. In the midst of the 2008 electricity crisis, government tried to introduce a protocol for new electricity connections. In terms of the draft protocol, a New Electricity Connections Protocol (NECP), new applications of more than 100kVA but less than 1MVA would be scheduled if the customers adopted energy efficiency technologies. Applications of more than 1MVA but less than 20MVA would be scheduled if the applicants committed to energy efficiency and energy savings in terms of Energy Conservation Scheme (ECS).⁵

Business was opposed to this approach and argued for an opportunity for customers to utilise new additional suppliers of power. They argue that this would create a strong incentive for investment in additional and efficient power generation. The protocol did not see the light of the day ultimately.

Now government is introducing an Independent System and Market Operator (ISMO) to ensure more private sector involvement in the electricity sector. The introduction of private sector players in the electricity sector will inevitably result in higher prices of electricity, and the poor are the ones to suffer in this regard. Higher electricity prices will cause more strain in other sectors of the economy, thus jeopardising any job creation prospects.

Government had to be convinced about the need to increase the share of renewable sources of electricity in the IRP. Ultimately the renewable sources of electricity, which are critical in the fight against climate change which is putting the lives of ordinary people in the main at greater risk, were increased in the IRP from 11400MW to 17800MW.

There seems to be mistrust about the renewable sources of electricity because they “can not provide the base-load energy”. Again, those who need base-load energy are energy intensive users and certainly not residential consumers. Whilst the share of coal in electricity generation, which provides base-load energy, would be decreased by 27.2% in 2030, this decrease would be compensated by a massive increase in nuclear energy. This increase in nuclear energy is defended by the base-load energy argument.

The nuclear energy industry is both capital and skills intensive. As a country, we do not have nuclear skills base. The Koeberg nuclear plant was built by a French nuclear company Areva (previously known as Framatome)⁶. Therefore, the nuclear plants will be built by foreign nuclear companies, with foreign skilled workers. Not only that, but most of the inputs will be imported and thus little benefits will be derived by local manufacturers.

This commitment to invest massively in nuclear power will require trillions of rand. At the same time financial markets do not have the appetite for the risk associated with nuclear investments; and the World Bank, which has granted Eskom the loan for coal-fired power stations and renewables, is currently not funding new nuclear projects.

The reality is that the nuclear industry cannot be viable without massive financial support from the government. The Department of Energy acknowledged this fact in the Energy White Paper: *“Despite its small contribution, the nuclear industry has been the recipient of a major portion of DME’s budget...”* In 2010 government was forced to close down the Pebble Bed Modular Reactor (PBMR) because its costs had escalated dramatically, and at the time of its closure, government had already spent about R9 billion.

Whilst we are told that a major nuclear accident is unlikely except in cases of human errors, natural disasters or terror attacks, three major nuclear related disasters have occurred in just about thirty years, viz., Three Mile Island, Chernobyl and now Fukushima.

Nuclear energy is characterised by a problem of dangerous long term radioactive waste with onerous requirements for safe custody over a period of some thousand years. Whilst we are told that a major nuclear accident is unlikely except in cases of human errors, natural disasters or terror attacks, three major nuclear related disasters have occurred in just about thirty years, viz., Three Mile Island, Chernobyl and now Fukushima. In financial terms, nuclear incidents can be so devastating that the cost of full insurance would be so high to make nuclear energy more expensive than fossil fuels.

Japan’s Fukushima disaster has shown that nuclear power is a viable source for cheap energy only if it is insured. Governments that use nuclear energy are torn between the benefit of low-cost electricity and the risk of a nuclear catastrophe, which could total trillions of dollars. Nuclear risks, be it damage to power plants or the liability risks resulting from radiation accidents, are covered by the state.

Climate concerns are said to be the force behind the resurgence of nuclear energy as part of the energy mix. The Copenhagen Accord requires of developing countries to submit proposed Nationally Appropriate Mitigation Actions (NAMAs) showing their plans to reduce their Green House Gases (GHG) emissions through specified projects. Accordingly, nuclear energy is touted as a solution to the challenges of climate change, and developing countries are advised to have nuclear energy policy to meet the commitments of the Copenhagen Accord.

But nuclear energy is not as clean as its supporters want us to believe. If the full life-cycle of nuclear energy is taken into account, uranium mining up to electricity generation, there is carbon dioxide generated and released into the atmosphere.

The Poor Pay the Price for Energy Intensive Users

Thus far, government has not clarified where the resources to fund the IRP would come from. The main source of revenue for the electricity sector is electricity tariffs. Already South Africa has seen steep electricity tariff increases since 2008. The National Energy Regulator of South Africa (NERSA) allowed Eskom a 27.5% tariff increase for 2008/09. In 2009 Eskom applied for an interim price increase of 34% to cover its main operational costs.

In 2010 NERSA awarded Eskom an average tariff increase of 25.5% each year, until 2012/13. This trend of steep electricity hikes will result in many of the poor not being able to afford electricity at all, and they will turn to more dangerous sources of heat and light, such as paraffin and gas. At the same time media reports indicated that Eskom continued to charge energy intensive users an average electricity price of between 9c/kWh and 17c/kWh.⁷ The massive investment in the electricity sector will continue to benefit EIUG through these low electricity prices for them.

Conclusion

The EIUG continues to influence the policy direction in the electricity sector. While the IRP shows an increase in the share of renewable sources of electricity, it is, however, still too small when compared to fossil fuel and nuclear proportions in the plan. The argument always given is that the renewable sources of electricity cannot provide base-load energy and cannot be relied on for security of supply. The question, then, that should be asked is: who needs base-load power? Surely it is not the residential customers but big electricity guzzlers who pay very little for the electricity prices.

NOTES

- 1 In terms of Quarterly Labour Force Survey, the official unemployment rate stood at 25% in the 3rd quarter of 2011
- 2 Information sourced from Electricity Pricing Policy: 2008
- 3 Information sourced from Institute for Democracy in Africa (IDASA) presentation to NEDLAC labour constituency on IRP: 2010
- 4 See EIUG website: <http://www.eiug.org.za/about/>
- 5 Department of Energy (2008) Draft criteria to be applied to screen applicants for electricity-intensive industrial and commercial processes
- 6 Mosia, J. 2011. Is Nuclear Power a Solution to SA's Electricity Crisis? The Shopsteward. No. 3 Volume 20. June/July, pp 25-26
- 7 See Davie, K. 2009. Eskom's Crazy Plan. <http://mg.co.za/article/2009-10-17-eskoms-crazy-plan>.