

Opinion & Analysis

QUOTE OF THE DAY

Life shrinks or expands in proportion to one's courage. —Anaïs Nin, American author

Nuclear energy misunderstood by vast majority

POWER POLITICS

Kelvin Kemm

I AM A nuclear physicist, so the whole development of nuclear power in South Africa is of great interest to me. But as this whole saga has unfolded it has also been of great interest to me to watch all the psychology and sociology unfold.

At times, it seems like everybody is asked for their opinion on nuclear power except the people who are actually qualified to talk about it.

Interestingly I read an article in a top South African financial magazine that was rather critical of the nuclear power project and the article quoted 10 people whom the author had asked for an opinion. Not one of them was qualified in nuclear technology in any way. One was a prominent British anti-nuclear activist, two were other foreigners, one South African was qualified in theology and the rest were in financial institutions.

One US finance expert said: "I've always been sceptical of such an ambitious programme for a country like South Africa."

I wonder if that fellow knows that the SA Nuclear Energy Corporation is the second-largest exporter of nuclear medicine in the world, earning more than R1 billion from those exports.

Does he know that the Safari 1 nuclear reactor near Pretoria is considered to be the most effectively utilised reactor of its type in the world? It celebrates its 50th anniversary this year, with a proud history of achievement. We South Africans are not new in this game; we have been in nuclear since the very beginning.

Perceptions

Last week at the Brics meeting in Russia, the South African Department of Energy signed two memorandums of understanding (MOUs) with Russian nuclear corporation Rosatom.

The first is for a training co-operation deal in which several technical areas will be addressed and initially 300 South Africans will be sent on nuclear programmes at Russian education institutions. This includes the mutual development of training programmes and materials.

The second MOU relates to the public awareness and public understanding of nuclear. People around the world are woefully misinformed about nuclear science and nuclear reactor operations. The agreement allows for a range of public information options, such as publications, meetings,

conferences and others. This really is necessary because the mere mention of the word "nuclear" can spook the public to an amazing degree.

Let us ponder the new nuclear power station build. South Africa as a country is very big by European standards. South Africa is about the same size as the whole of Europe. The distance from Pretoria to Cape Town is the same as Rome to London.

So in the Western Cape we have the Koeberg nuclear power plant, which produces about half the power to the Western Cape. The other half comes from the coalfields on the other side of Pretoria. When I explained that at a conference in London, they all reacted with "Are you crazy?"

Imagine if we powered London with half the electricity coming from Rome. That is nuts, far too risky. But we do it, using power lines so long that the folks in Europe can't believe it. We do this using the highest altitude, highest voltage power lines in the world, designed and built by South Africans at Eskom.

If we really want to grow the South African economy we had better look ahead with some real wisdom. Furthermore, it is necessary to ask South Africans how to do it. Don't phone the US and the UK.

The world's nuclear specialists are not laughing at us or ridiculing us. They are watching intently, with great respect.

When, years ago, Eskom proposed building the world's largest coal-fired power stations without using water cooling, the rest of the world laughed, and said things like: "You guys in Africa, changing the rules, building the world's largest, come off it." One thing we don't have much of is water, so our scientists and engineers just built the huge coal plants without the water, and they work great.

Unlike British anti-nuclear activists, the world's nuclear specialists are not laughing at us or ridiculing us. They are watching intently, with great respect. In fact, they are queuing up to get involved.

Okay, but now I have to address this cost issue. The press are loving this R1 trillion number, and I even see in some publications that this has grown to R1.2 trillion. In fact, the local nuclear specialists think that the real figure will be about half that.

When I spoke to an agitated critic who called me recently I asked "Who do you think will dig the foundations, pour the concrete and build the walls of the new plants? Will South Africans do it, or will we import the cement, sand, stone, and workmen?"



The Pelindaba nuclear facility near to Pretoria houses the Safari 1 nuclear reactor, which has been operating for 50 years and is considered the world's most efficient reactor of its type. The writer contends that South Africa has world-class skills and knowledge in nuclear technology, having been involved from the industry's very beginning.

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"Okay we South Africans will do it," he said. So I replied that he was then prepared to accept that all that construction money would go to one or more South African companies. He agreed. He also agreed that money would be allocated locally concerning water supplies, sewage systems, access roads, power lines and much more.

So then he agreed that, well yes, quite a significant part of "the cost" would actually go to local companies, so leading to job creation and domestic economic activity. "Yes I see, okay I agree," was his response.

So, instead of crying crocodile tears about the media-invented total "cost" of R1 trillion, why don't we do what we do with every large project and call it a budget. Then we must examine how this budget will be constituted.

Localisation

At this stage the government has indicated a localisation target of 50 percent. That means that, for starters, half the money stays in South Africa.

In the meantime, I can assure readers that local companies are not only able to dig foundations and pour concrete, they can also do considerably more than that. South Africa has companies that can weld and machine components to nuclear standards. There are people who can do the electronics, wiring, circuitry, and so on. We already export high-tech parts to companies such as Boeing and Airbus.

The plan is to do the same for nuclear. Furthermore, we don't only want to fabricate high-tech components for our own nuclear plants, we want to do this fabrication so well that we export parts all over the world and earn income for the country.

In this new build nuclear programme, South Africa is not just purchasing nuclear reactors; we are planning to become significant players in the world nuclear market. We already are players in the world nuclear market; we must just get a lot bigger and better at this game. It is the future. It is very good business sense to get into this game now in a significant way.

It is my belief that South Africans must project manage this operation. We know our country – the climate, weather, labour operations, transport systems and so on.

The plan is to fabricate high-tech components for our own nuclear plants... to do this fabrication so well that we export parts all over the world and earn income for the country.

It is not true that South Africa shelved nuclear power plans in 2008 because it was too expensive, and that now the plans have been revived. In 2008 Eskom, rather foolishly, put out turnkey tenders containing fixed delivery dates and so on. This was totally out of character for an organisation that had previously successfully embarked on some of the world's largest power projects.

At the time the vice-president of a major US company said to me: "Are they out

of their minds? If they took away the turnkey element we could cut billions off the price; not mere millions."

Luckily someone saw sense and stopped the tender. Then people started to regain their self-confidence and realised we can build these plants ourselves, in collaboration with one or more foreign partners. We don't have to sit helplessly asking for help.

The total budget for this nuclear build exercise will be spread over about 15 years, as we build three whole nuclear power stations with two or three reactors per station. This is a budget for an exciting new journey not a once-off purchase. So stop believing all the nonsense that you read that the money is "equal to the whole gross domestic product of the country" and other such silly comments which I am seeing with monotonous regularity.

Undeterred

Incidentally, when the Fukushima tsunami incident happened in Japan in 2011, the South African energy minister at the time was the only minister in the world who stood up the following week and stated that we were undeterred and were carrying on with our nuclear plans. History has shown that she was right.

The total people killed or injured by nuclear radiation at Fukushima was zero. Yes, zero. A UN report, produced by more than 80 qualified investigators from 18 countries, has stated that no long-term negative affects to people were anticipated from any nuclear radiation, because radiation was so low as to be insignificant.

Fukushima was not a nuclear disaster; it was a conventional disaster, plus a massive media hype. But the mere word

"nuclear" continues to keep Fukushima in the news, while people forget about the many thousands of Japanese citizens who died in the wall of water and debris. None died as the result of any nuclear radiation.

South African nuclear professionals are very good and are internationally rated on par with anyone. Do you really think that South African scientists and engineers started designing new nuclear power stations without putting the price of the final product on the design page, on day one?

On day one a design criterion was that the price of the nuclear-generated electricity would have to be about the same as the price of coal-generated electricity.

Current calculations done by North West University show that nuclear should actually come out cheaper than coal. It is far better to believe the opinions of the large team of local design engineers than those of an anti-nuclear activist in the UK.

Can you imagine engineers would design a bridge, then start building it without first figuring out how many cars are supposed to drive over it. They don't do that with nuclear power stations either.

We have to build the nuclear plants from the south up, so that the folks in the Eastern and Western Cape don't have to pull power all the way from the coalfields. In this way we will set up the country for good growth over the next century.

But, starting right now, South African companies can get into the nuclear components fabrication export business. There is a market of 500 nuclear reactors around the world, open for business.

Kelvin Kemm is a nuclear physicist and chief executive of Nuclear Africa. He is a member of the Ministerial Advisory Council on Energy.