



**NIASA INPUT INTO SOUTH AFRICA'S
IRP2 DEVELOPMENT PROCESS
(CSIR Convention Centre 7-8th June 2010)**

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1. NIASA Mission & Vision
2. NIASA Goals
3. Demand Input Parameters
4. Supply Input Parameters
5. Conclusion

NIASA Mission & Vision

Mission: To represent the Nuclear Industry in South Africa and to support, promote and champion the collective interests of its members and the country.

Vision: To have a local nuclear industry that has increased local content and that is globally competitive.

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NIASA Goals

1. To act as a public voice for the nuclear industry.
2. To actively promote the maximum local industrialisation and economic clustering of nuclear manufacturing in South Africa.
3. To promote skills development, job creation and Black Economic Empowerment through the nuclear industry in South Africa.
4. To promote excellence and a culture of safety and security within the nuclear industry.
5. To facilitate coherence and to avoid duplication of effort in the development and expansion of the nuclear industry.

NIASA Goals (cont'd)

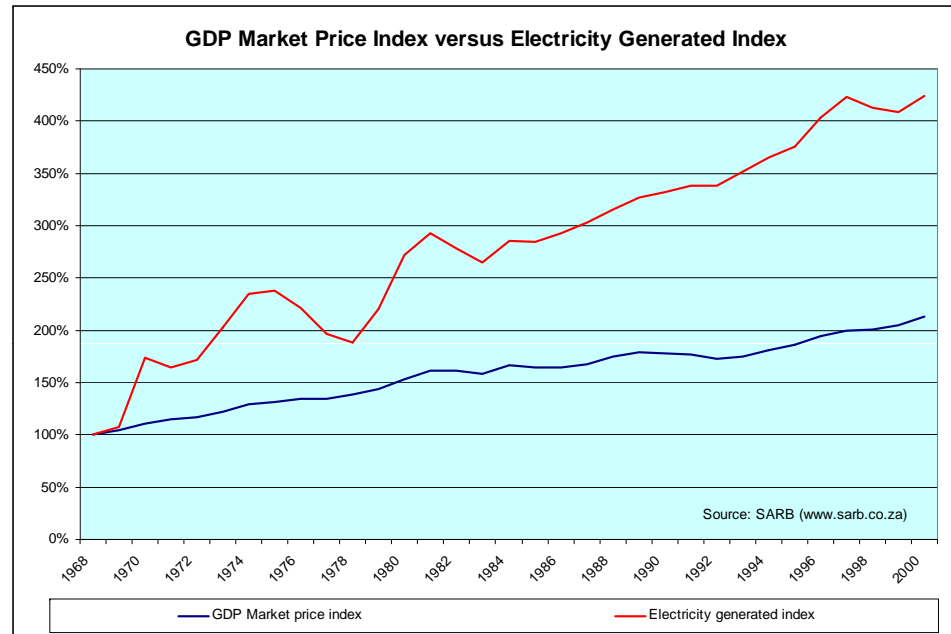
6. To present a common face and purpose to Government on shared values and concerns.
7. To promote public understanding of nuclear technology.
8. To act as a sounding board to Government on policy formulation.
9. To promote a common approach to research and related scientific issues and the role of universities.
10. To facilitate the solution of problems or obstacles faced by the industry.

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Demand input, D1-D10

- ❑ NIASA believes that the projected electricity demand increase relative to increase in GDP is modest.
- ❑ Increase in electricity demand about double the GDP increase as opposed to 3:2 ratio in document.



Demand input, D1-D10

- ❑ A period of **15 years too short** for the assumption(s) considering that it takes about 10 years from making an investment decision on building a power plant to commissioning it.
- ❑ The price increases for electricity for coming years are now known - **info should be updated**.
- ❑ The projected price increases are too high, especially in the 2012/13-2014/15 period, and suggest that electricity in SA by 2015 would be **more expensive than in Europe** which cannot be correct.
- ❑ It is proposed that the **pricing model should be reviewed** and adjusted.

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Supply input, S1-S12

- ❑ COUE: Consideration to be made that lack of investment in the country due to uncertainty on energy supply would have a **severe impact** on the economy.
- ❑ Reserve Margin:
 - ❑ The credited capacity for concentrated solar **without storage** in SA maximum of 25% (i.e. **<25%**).
 - ❑ For concentrated solar **with storage** the credited capacity **< 100%** (tariff makes provision for only 6 hrs storage).
- ❑ Discount rate: Considering that the cost of electricity should be limited, the **cost of equity** is a bit **high** for a State-Owned-Enterprise. In some countries discount rates in the order of **0-3%** have been used.

Supply input, S1-S12 (add following....)

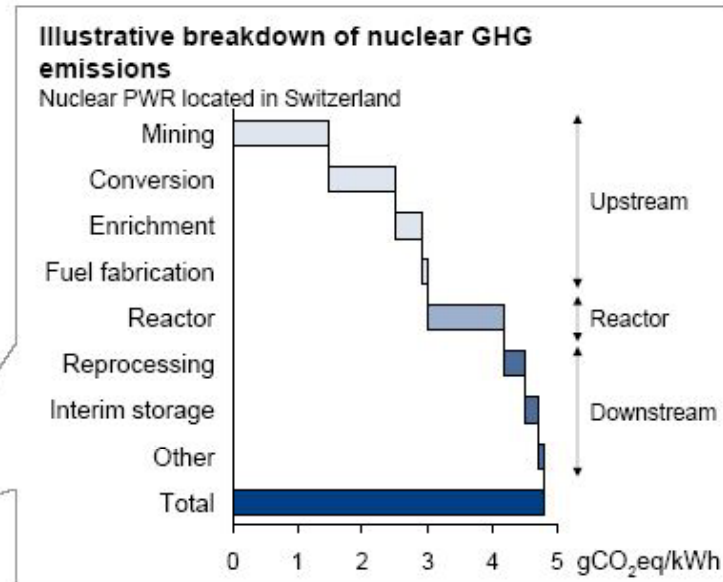
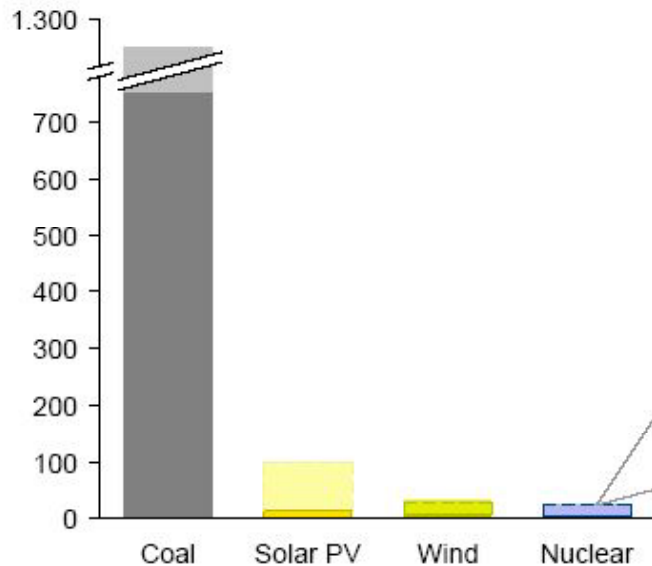
- ❑ A few percent of intermittent energy (GWh) can be added to the grid **without substantially reinforcing it**. The maximum intermittent energy contribution that can be sustained by the national grid will be determined.
- ❑ 3rd paragraph in S4 document should state ‘Renewable Energy is more capital intensive than fossil fuelled plant and nuclear plants and therefore....’ - it is intermittent energy supply and hence base-load supply is still required as back-up.
- ❑ Hydro power from central Africa is feasible but not within the current planning horizon.
- ❑ Renewables technologies other than hydro, wind and sun must be pursued but are too immature to be considered within the current planning horizon.

Supply input, S1-S12 (add following....)

- ❑ **Carbon emissions** from the complete nuclear fuel cycle and from renewable energy sources are comparable and tend to **favour nuclear**. Both are vastly less than fossil fuel emissions'.

Comparison of greenhouse gas emissions

gCO₂eq/kWh



Supply input, S1-S12 (add following....)

- ❑ Biomass production uses large areas of watered, arable land and competes with food production. Priority should be given to ethanol production for transportation fuel.
- ❑ The erection of numerous wind turbine towers makes far heavier demands on natural resources than do conventional power stations, particularly in respect of the quantities of steel and concrete required (University of Stuttgart research).
- ❑ Installation time must be considered. For example, it has been reported that there are in South Africa **only two cranes** capable of lifting wind-turbines high enough and that there are in the world only two maritime cranes large enough.

Supply input, S1-S12 (add following....)

- ❑ Cost projections for renewable energy must take into account the **uncertain lifespan** of, in particular, off-shore wind-turbines.
- ❑ The impact of the relatively high cost of renewable energy on job creation must be considered. Spanish experience (reported by the Universidad Rey Juan Carlos in 2009) is that 2.5 jobs have been lost in the Spanish economy for every job created by the use of renewable energy.
- ❑ Energy storage technologies may, or may not prove economically and technically viable. Other than pumped storage they cannot be included in the current planning exercise.

Supply input, S1-S12 (add following...)

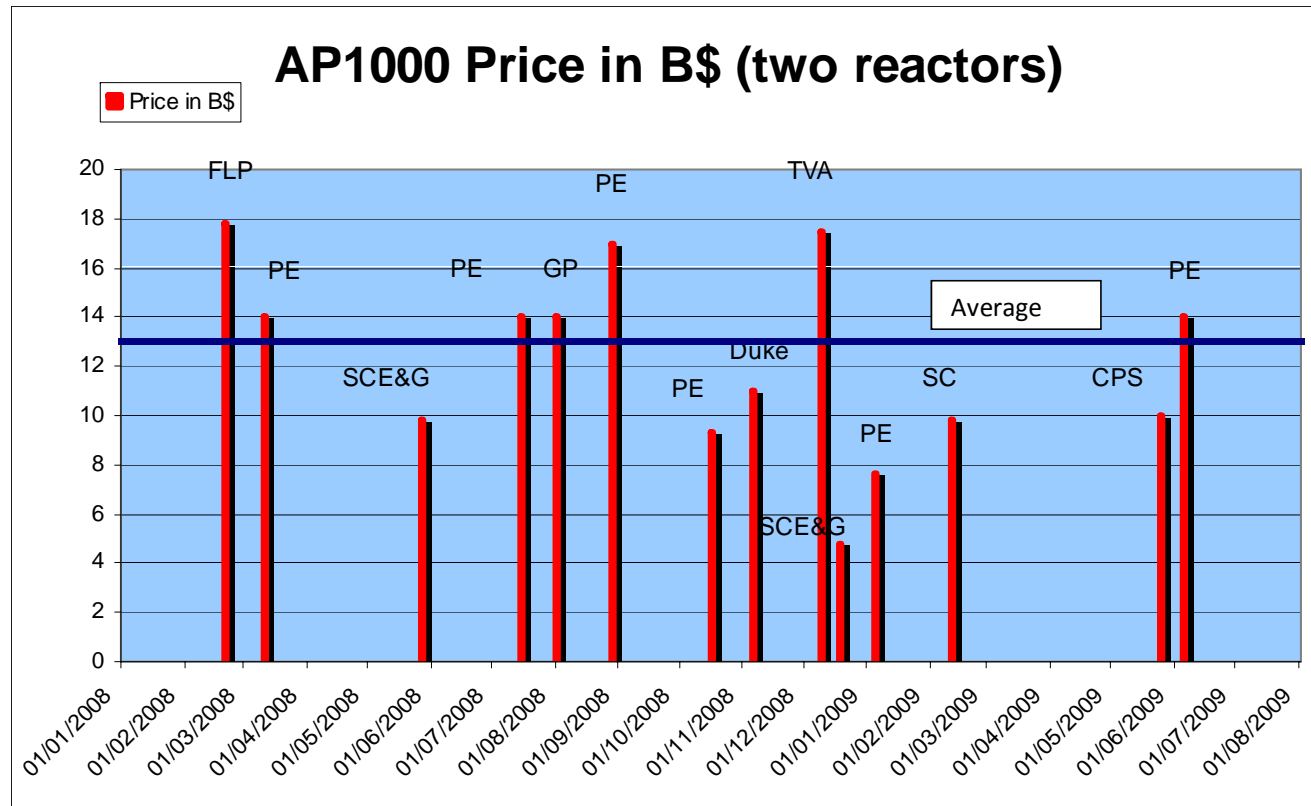
- ❑ A nuclear programme will introduce the possibility of a **uranium fuel cycle industry** from mining via conversion, enrichment and fuel fabrication to reprocessing and waste disposal.
- ❑ In addition, a fleet approach raises the possibility of **local manufacture** of much of the plant. A spin-off benefit will be enhanced levels of technology and technical expertise throughout South African industry.
- ❑ Nuclear technology is well-proven. It is well suited to reliable base-load operation – and some plants in France can do **load-following**.

Supply input, S1-S12

- ❑ The manufactured fuel cost amounts to **less than 15%** of the levelised generation cost. The generation cost is only insensitive to changes in the uranium price which represents approximately $(1/3)^{\text{rd}}$ of the manufactured fuel cost. The cost of nuclear electricity will therefore remain **relatively stable**.
- ❑ The cost from **international benchmarks** must be used circumspectly as the benchmarks may not be accurate. We have seen large variations of prices for Reactors supplied by the press..
- ❑ Caution must be taken that only the **nuclear vendors** can provide **accurate costs** of the Reactors.

Supply input, S1-S12

Variation of prices provided by the press for US plants in 2008-2009

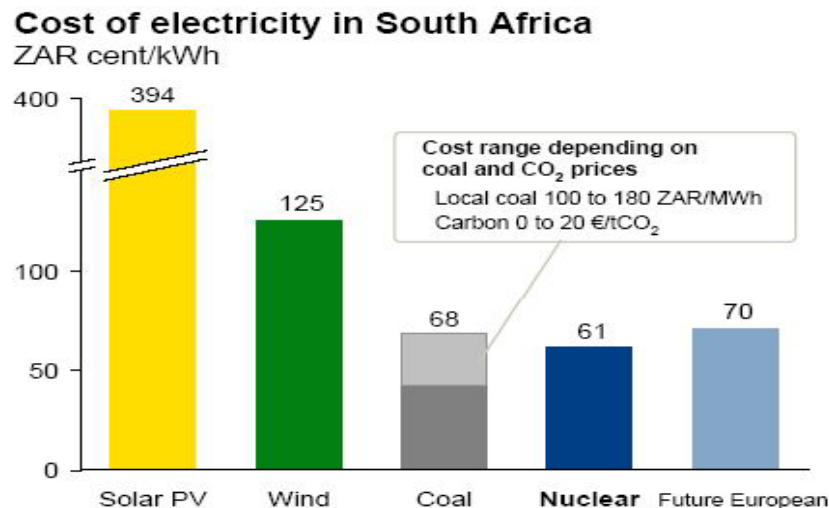


Supply input, S1-S12

- ❑ NIASA proposes the building of the nuclear fleet to begin **earlier in 2019** which would benefit the country from a CO₂ reduction and economic standpoint.
- ❑ The **fleet approach** is well **supported** by the nuclear industry in order to optimally exploit relationships with vendors, standardisation, localisation and local content, and to give effect to the NEP position on these matters, and to develop a local fuel cycle services sector.
- ❑ NIASA supports **Advanced Reactors** as another nuclear option to consider for the **future**; especially regarding future participation in gas cooled fast reactor or other Gen IV programmes, even though these will not be part of the installed capacity for quite some time to come.

Supply input, S1-S12

- ❑ Generation Life Cycle Cost: The table of 11 reputable independent studies is of **concern**. It shows the cost of nuclear as being about **3 times** more expensive than that of coal and gas (which **cannot** be so...).
- ❑ The table is also **not supported** by the **current reality** of the cost of electricity in SA



Supply input, S1-S12

- ❑ It is a concern for the nuclear industry that **Generating Plant Location** will not be an input consideration to the IRP 2010 plan.
- ❑ The definition of base-load should **not** only refer to **coal**, but should **include nuclear**.
- ❑ NIASA supports the roll-out of nuclear plants earlier as from 2019 in batches as proposed in the table for generation mix.
- ❑ NIASA believes that the current **funding and financing model** needs to be reviewed as it is based on a higher price of electricity projected than is reasonable.

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Conclusion

- ❑ NIASA supports the systematic and logical approach adopted by government for the development of the IRP2.
- ❑ Concerning the energy mix NIASA supports the use of **all** CO₂ free technology.
- ❑ Given South Africa's anticipated nuclear energy expansion programme there needs to be an associated policy response to deal with **security of uranium supply** for fuel manufacturing.
- ❑ There needs to be alignment of this and other policy changes progressing concurrently (e.g. the establishment of an Independent System Operator for South Africa's electricity grid).



Thank You!!!

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