

Benefits of a nuclear program for South Africa



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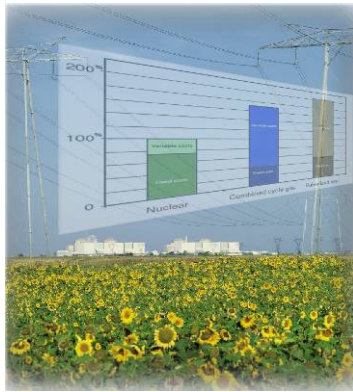
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South Africa's nuclear vision

- Diversify the energy mix to reduce CO₂ emissions
- Enter into the global energy market
 - Attain global leadership in the nuclear energy sector
 - Develop Industry sector linked to nuclear
- Contribute to a national program of social and economic transformation
- Maximize the value of uranium produced by South African mines
- Improve the quality of human life while supporting the advancement of science and technology

Nuclear Energy provides sufficient and affordable CO₂ free electricity

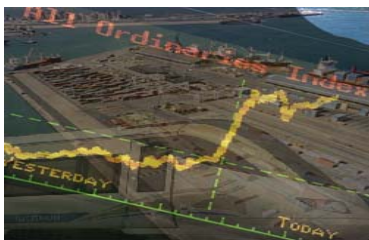


● Sufficient:

- Can meet the level of expectations of the nation for base-load electric energy generation
- Can satisfy any program size depending on the national strategy choice of energy Mix

● Affordable: Electricity generation from nuclear is cost effective

- is among the lowest costs of all technologies
- is equivalent to coal
- is little sensitive to fuel cost, future costs are certain
- is Carbon neutral = not affected by CO₂ taxes, allowances or CO₂ capture costs



Nuclear projects are a stimulus for the economy

A productive infrastructure investment strategy that:

- Creates thousands of jobs
- Establishes a productive infrastructure feeding the economic and social growth
- Is now used by Governments to boost their economy:
 - **France** will speed up the construction of second and third new units by 4 years
 - **USA** DOE providing 58B\$US for loan guarantee to allow a fast track for construction
 - **UK** will speed up the licensing process and request job creation in the Country





Nuclear projects are a stimulus for the economy of South Africa

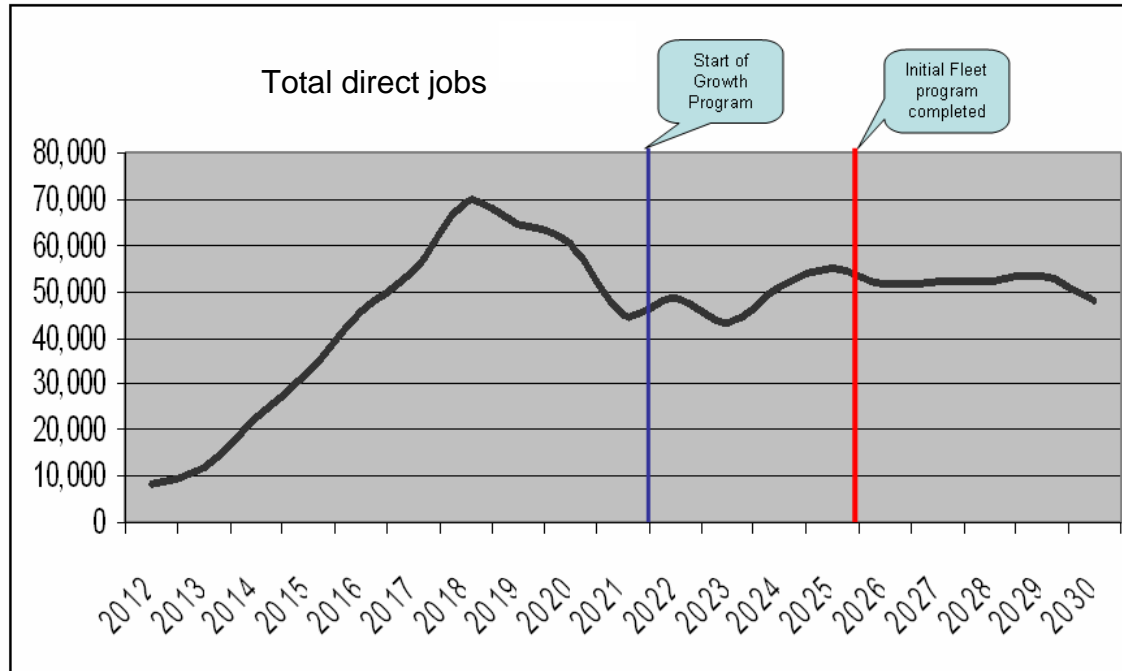
- **Going forward with the South African nuclear program:**
 - 20 000 MW nuclear built in SA within 15 to 20 years
 - Nuclear industrial development
 - Supply chain localization program
 - Access to export markets

- **A powerful catalyst for the national industry growth with global economic impacts:**
 - Expansion of industries specializing in the supply chain and spin-off industries,
 - Employment growth and permanent jobs,
 - Substantial economic activity in all sectors,
 - Tax revenues,
 - Economy diversification,
 - Community involvement, ...

Significant and sustainable impact on jobs creation

- **Direct Jobs** to build and operate power plants:

- 70 000 at peak of construction
- 50 000 permanent



- **In various sectors** such as:

- construction >40%,
- manufacturing >40%,
- operation & maintenance >15%,
- engineering >5%,

- **Jobs are highly skilled and well compensated**

- **Induced jobs** in the community are at least:

- x 2 during construction phase of power plants
- x 5 over the operation phase of power plants

Sustainability for decades in the induced economical life



Nuclear projects are a stimulus for the economy of South Africa

● Direct jobs include:

- Design and construction of the plants,
- Manufacturing based on purchases by the plant contractor and second tier suppliers,
- Operation and maintenance at the power plants,
- Turn-around at the power plants,
- Nuclear industry new facilities,
- Regular expenditures to local manufacturers and service organizations.

● Induced jobs include:

- Jobs created in the nearby communities to support the in flux of new residents i.e. doctors, teachers, local municipality workers, policemen, firemen, workers in all other local businesses (supermarkets, restaurants, housing, etc...)

An example of induced job creation

The welding trade is a key to the construction of the nuclear fleet as well as other projects including the oil and chemical industries.

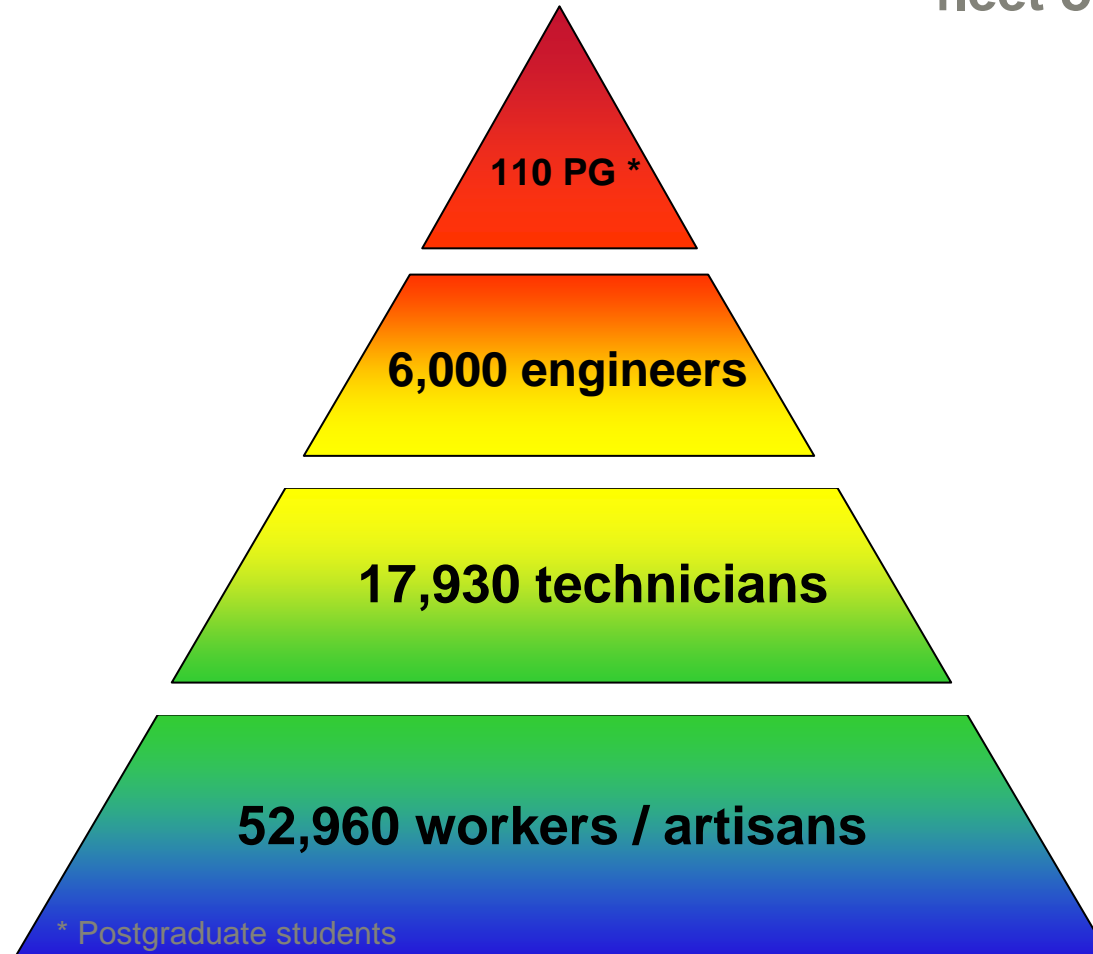
This trade provides an example of jobs created in addition to the welder himself. These induced expenditures directly translate into additional manufacturing jobs in South Africa.



- Welder training schools
- Welding Machines
- Welding electrodes and filler wire
- Welding electrode holders and guns
- Electrode storage ovens
- Welder's helmet
- Gloves
- Protective vest
- Electrical cable
- Welding and cutting gases
- Bottles for shipping and storing the welding gases
- Gas hoses for welding
- Fuel for running the diesel generator welding machines

Development of critical skills to power and sustain the economical growth (1)

77,000 South Africans will be trained for the South African nuclear fleet of 20,000 Mwe



* Postgraduate students

Development of critical skills to power and sustain the economical growth (2)



- Breakdown of skills development by activity:
 - construction = 30 000 persons
 - manufacturing = 30 000 persons
 - operation and maintenance = 17 000 persons
- Quality requirements of nuclear industry necessitate highest skills in all competencies
- Skills developed for the nuclear industry will benefit to other technology intensive and specialized industries
- Skills development in partnerships with universities will also lead to more R&D capacity in South Africa

Enter the global energy market and improve the balance of trade

The nuclear program will benefit to major local industries by:



- increasing their manufacturing capacities
- enhancing the quality and competitiveness of their products permitting:
 - access to new export markets, then South Africa can become a global player in the nuclear industry
 - manufacturing locally many products that are currently imported

We are already committed to South Africa ...

..., and we are ready to partner for much more and help South Africa grasp this opportunity

AREVA Resources
Ryst Kuil, project



Nuclear Services



Research Reactor
Fuel: CERCA



KOEBERG Nuclear
Power Plant



Support to social
development initiatives



Transport & Distribution
of Electricity



Skills development



AREVA
A Partnership
for Energy Certainty



A nuclear program is a true opportunity for South Africa

- to boost growth at times of economic downturn
- to create hundreds of thousands of permanent jobs
- to develop vibrant, high-tech industries and research capacities
- to improve balance of trade from value added products
- to meet future electricity demand in an environmentally friendly, affordable way.



19 PWR nuclear power plants, **58** units, **63GWe**, **78%** of the nation electricity

as per 2008



- Launch of program of fully standardized reactors:
 - economies of scale,
 - development of the industries,
 - operation advantages:
 - return of experience,
 - operator training, etc...
- Financing on international markets with government guaranty
- No cost to the taxpayer

The Program of fully standardized PWRs initiated in early 70's
 With a rhythm of 6 units ordered every year, most of constructions came on line within **10 years**

