

AREVA in the Republic of SOUTH AFRICA



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POLITICAL AND ECONOMIC CONTEXT IN THE REPUBLIC OF SOUTH AFRICA

A stable and calm political context

South Africa had a population of 47.9 million spread across a surface area of 1.2 million km² (the equivalent of France, Germany and Italy put together). The country won its independence from the UK in 1910. It has three capital cities: Pretoria is the administrative capital, Cape Town the legislative capital and Bloemfontein the judicial capital. South Africa accounts 4% of Africa's surface area, 5.5% of its population and 25% of its GDP.

Since its first free and multi-racial elections in 1994 South Africa has been a parliamentary democracy and the stability of its democratic bodies – as witnessed at each election - is solid proof of the peaceful political and social climate.

Nelson Mandela saw through the transition from the apartheid regime. His successor, Thabo Mbeki, promised to continue in the same vein for political and economic affairs, while accelerating social reforms.

The African National Congress (ANC) widely dominates the political scene. It holds two thirds of parliamentary seats and controls – either alone or as part of a coalition – eight of the nine provinces. Parliamentary opposition representing the traditional white and Zulu electorate is limited. In December 2007, Jacob Zuma, was appointed President of the ANC.

One of the leading economic powers in Africa

Economic development in South Africa is similar to that of any industrialized nation. With a GDP of 252 billion dollars (2006 economic conditions), the country's wealth is more or less on a par with Greece or Thailand. Its primary, secondary and tertiary sectors account for similar GDP percentages as Western countries (10%, 30% and 60% respectively). Annual GDP growth in 2006 was 4.6% but the government is banking on a 6% annual growth rate in the medium term.

South Africa has a range of infrastructures, the main modern technologies and recognized industrial expertise such as electricity generation and nuclear energy. The country's economy is based on high performance banking structures and the Johannesburg Stock Exchange is ranked seventeenth worldwide.

South Africa boasts exceptional industrial and mining capacities (world leader for gold, manganese, chromium and platinum, third for diamonds, sixth for uranium). This wide range of precious ores ensures that the country enjoys substantial foreign currency earnings (50% of exports).

The economic landscape is marked by a number of private and public conglomerates that are true multi-nationals in the fields of mining, energy, armament and telecommunications. ESKOM (electricity), ANGLOAMERICAN (mining extraction), Rembrandt (tobacco, luxury products, and media), SASOL (chemistry) and South African Breweries (farm produce) are among the top 500 world companies in terms of revenues.

The increased purchasing power of the black population is paving the way for the development of a new internal market, supported by social "catch-up" policies.

With a negative commercial balance (-6 billion dollars in 2006), South Africa pursues a prudent debt policy, rarely borrowing from the World Bank and has never had recourse to the IMF.

The country welcomes 7 million tourists per year. It has 18 national parks and over 300 natural reserves.

Considerable post-apartheid work to modernize the economy

Up until the political changes of 1994, the economy was in a poor way: The annual growth rate dropped from 6% in the 1960s to 3% in the 1970s, 2% in the 1980s and -1% between 1990 and 1993 coupled with increased inflation and public deficits. These poor results were due to the drop in mining revenues and more especially sanctions relating to Apartheid (economic downturn, exclusion of the majority of the population from the education system, etc.).

Post-1994, economic policy concentrated on budgetary clean-up and the government's willingness to modernize the economy through a liberal policy and openness to foreign investors. In 1996, the Growth Employment and Redistribution (GEAR) program was launched to privatize the public sector, get the country out of debt and finance far-reaching social programs.

Since then, the country has enjoyed growth once again (4% on average since 2002) and is now tackling a range of issues, including: weak savings and internal market, delays in the privatization program, South African dependency on the global economic trends due to the prominence of its largely unprocessed raw material exports and help with foreign investment.

A country opening up to the world

The end of Apartheid and the country's reintegration in major world organizations has considerably accelerated the country's openness to the world and South Africa has removed its customs and tariff barriers. Following years of withdrawal and isolation, the RSA is now showing trade figures nearing those of Western Europe (total exports and imports represent 50% of the GDP).

The European Union is its leading sales partner (40% of South African foreign trade) ahead of Asia (20%), the US (13%) and Africa (8%). France is South Africa's seventh supplier, behind Germany, the UK and Japan.

South Africa offers investment opportunities for foreign companies, in particular in its internal market and uses Anglo-Saxon business laws. Adapting to globalization, developing black capitalism and the signing of major multilateral agreements (in particular with the European Union) all offer opportunities for investment.

Aware of the place it holds in Africa and the resulting responsibilities, South Africa is especially interested in supporting the development of the African continent and plays an active role within the Southern African Customs Union (SACU) and the Southern African Development Community (SADC).

South African runs the SACU which includes Lesotho, Namibia and Swaziland. It also plays an active role in the SADC, an area of cooperation covering 190 million inhabitants with a GDP of 176 billion dollars and which brings together fourteen countries along with South Africa: Angola, Botswana, Congo, Lesotho, Malawi, Mauritania, Namibia, Seychelles, Swaziland, Tanzania, Zambia and Zimbabwe.

A gradually improving social situation

When Nelson Mandela came to power, 95% of the country's wealth was in the hands of the 5% of the population which was white. The aim of the reforms in place since 1994 has therefore been to reduce inequalities between the white population and the historically disadvantaged black population. The return to growth and cleaning up of finances has helped on a social level. Nonetheless, the ratio of black to white income remains 1 to 12. It is mainly the black population that is faced with social problems such as:

- Unemployment (around 25%),
- Access to infrastructures; in particular electricity: 25% of the population does not have access to electricity.

At the end of 2000, 4.7 million South Africans were HIV positive. This represents one inhabitant in six. In April 2002, the pharmaceutical industry abandoned its action against the South African government which was trying to promote generic medicine.

The country is no stranger to safety problems (20,000 homicides per year) both in the townships (very poor mostly black suburbs) and white residential areas. The security industry has become of major importance.

Black Economic Empowerment at the service of long-term development

The constitution of South Africa recognizes public interventionism and positive discrimination measures as a means of re-establishing equality between individuals, in a spirit of fairness: This is the philosophy behind black empowerment, supported by the ANC since the beginning. The aim is to redress past inequalities, ensure social harmony and create sustainable development conditions by getting the black population involved in the life of the country. Black Empowerment is based on a contractual culture and incentives (mainly financial) and applies to all aspects of the life of the country (economic, political, social and cultural). It advocates the division of wealth and key jobs on a prorata basis according to the ethnic weighting of each community.

BEE is the economic side to this. BEE focuses on transferring capital and seeks the substantial, negotiated and fair transfer of property and the management of economic and financial resources. The scope of application of BEE measures is wide and takes several forms.

At public level, the State uses its orders and outsourcing to public companies such as ESKOM to direct calls for bids in favor of black companies or those with partners from the black community. Over the coming ten years, the government wants to process 50% of its calls for bids in this way. It uses its regulatory power with regard to granting permits and concessions. It also relies on its privatization program.

In the private sector, BEE is mostly seen in minority share offerings of companies predominantly run by whites. However, other options respond to BEE criteria: joint ventures, recourse to suppliers from the black population (in particular SMEs), the development of franchise networks which combine managerial and financial support.

Some companies owned by the black community are especially important: Worldwide Africa Investments (shareholder in energy company Engen), New Coal (fourth largest producer of coal) and IT engineering firm Sekunjalo Investments (shareholder in Siemens South Africa).

Beyond the economic aspects, the government aims to increase the standing of the population through employment and training. In particular, the Equity Employment Act aims to integrate the black population into the business world and asks each employer to draw up a pro-active plan to train and integrate the black population.

Black Empowerment is the new norm which applies to all foreign companies wishing to set up in the new South Africa.

Map of South Africa

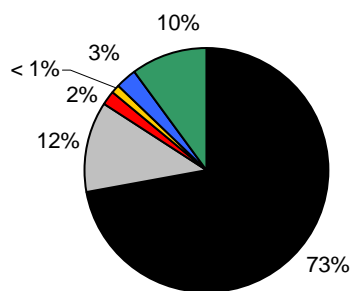


ENERGY REQUIREMENTS IN SOUTH AFRICA

An energy context which favors nuclear

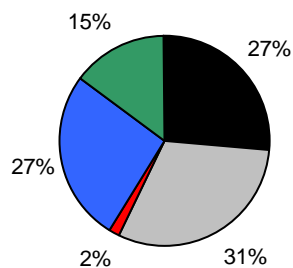
In 2005, over 85% of South Africa's energy came from fossil fuels. Primary energy supplies reached 129 MToe and final energy consumption 64 Mtoe.

South Africa - Total primary energy supply by source in 2005
Total : 129 Mtoe
(Source: IEA, "Energy balances", 2007)



■ Coal □ Oil ■ Gas ■ Hydro ■ Nuclear ■ Other Renew.

South Africa - Final energy consumption by source in 2005
Total : 64 Mtoe
(Source: IEA, "Energy balances", 2007)



■ Coal □ Oil ■ Gas ■ Electricity ■ Other Renew.

In 2005, South Africa emitted 330 million metric tons of CO₂, equivalent to 7 metric tons per inhabitant. This is above the world average (4.2 metric tons/inhabitant) although less than the average emissions for OECD countries (11 metric tons/inhabitant) (source: AIE, Energy balances", 2007).

Access to energy for all

In 2006, electricity consumption reached 216 TWh for a production of 254 TWh by 20 plants. Electricity generation, like the installed electricity generation capacity (44 GW), is over 90% coal based. Growth in electricity demands is estimated at 6% per year.

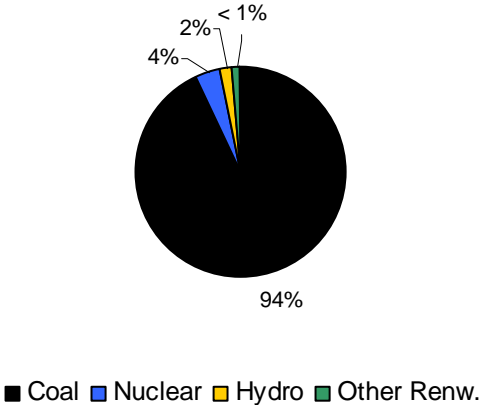
In 2007, South Africa experienced several blackouts. The electricity fleet is aging and quickly becoming saturated. In order to meet demand and avoid spurious blackouts, electricity is imported from Mozambique and ESKOM carries out power cuts on a rotation basis across the country for two to three hours per day. By 2030, electricity demands are set to increase by 20 GW, over and above the 40 GW already installed, 20 GW of which are arriving at the end of their service life and must be replaced.

The increased demand for electricity results from the increased number of households that need to be connected to the grid. One third of all households are not connected to the electricity grid. The issue of access to electricity is essential for the economic growth of South Africa and the African continent in general. Around ten million people – mainly black – live without electricity in townships and the distribution of electricity is a topic which creates much social tension.

The demand for electricity also comes from industrial customers (e.g. Pechiney is interested in building an aluminum production plant in Port Elizabeth which alone will require an availability of 1,000 MW).

The country's economic growth is hindered by an increasingly tense energy situation and major constraints: insufficient infrastructures and investment, including human resources.

South Africa - Electricity production by in 2006
Total : 254 TWh
(Source: AREVA)



Public company ESKOM generates 45% of Africa's electricity and around 95% of electricity in South Africa. The remaining 5% are produced by several independent companies which manage their own plants (mining operators, industrial companies, corporations). ESKOM is involved in the generation, transport and distribution of electricity. In 2006, ESKOM was the 11th largest producer of electricity worldwide in terms of sales (218 TWh) and the 10th largest world group in terms of electricity production capacity (43 GW). ESKOM operates in 15 African countries and employs 32,600 people.

The South African government plans to introduce greater competition in the electricity distribution field. ESKOM's role should be reduced, to the benefit of regional distributors (around six regional electricity distribution companies should be created).

Fossil and fissile fuel resources

- **Oil:** South Africa has oil reserves estimated at around 15 million barrels in 2007, all of which are situated in the Bredasdorp offshore basin in the southern part of the country. Annual oil consumption is 520,000 bl/day. Almost 50% of the country's oil consumption is imported mainly from Middle-Eastern countries (Saudi Arabia and Iran) but also from Nigeria and Angola. The country has Africa's second largest oil refinery industry and synthesis fuels industry. In 2006, South Africa produced 200,000 bl/day, 85% of which was in the form of refined oil products or liquid synthetic derivatives produced from coal or gas.
- **Natural gas:** In 2006, South Africa had an estimated 353 billion m³ of natural gas reserves. Production stood at 79 billion m³, all of which was destined for internal consumption. In order to compensate for its modest gas reserves, the country signed agreements with neighboring countries (Mozambique and Namibia) to import gas by pipeline.
- **Coal:** In 2005, South Africa was the world's 5th largest producer of coal with 244 million metric tons and 6th in terms of reserves (around 5% of world reserves). The vast majority of coal volumes is used to generate electricity and for the synthesis fuels industry. Over one third of coal produced is exported, mainly to Europe (Germany and Spain) and Asia (Japan). It is one of the country's main riches along with the exploitation of metal mines (gold, diamonds, platinum).
- **Uranium:** South African uranium resources are estimated at almost 340,600 metric tons (for a cost below 130\$/kgU), a figure which represents 7% of world reserves. National annual uranium production stands at around 900 metric tons or around 2% of world uranium production. Uranium extracts are a by-product from gold and silver mines.

REVIVAL OF THE SOUTH AFRICAN NUCLEAR PROGRAM

The current position of nuclear energy in South Africa

The Koeberg plant, near Cape Town, is the only nuclear power plant on the African continent (1800 MW net). AREVA built the twin units of the Koeberg nuclear power plant. Koeberg nuclear power plant is owned and operated by ESKOM. The twin 900 MWe pressurized water reactors (PWR) are the same as those providing most of France's electricity. They generate around 10 TWh of electricity, or 5% to 6% of the country's total electricity production

South Africa is a member of the Generation IV International Forum (GIF IV). This forum brings together twelve member countries (United States, France, Canada, UK, South Korea, Switzerland, Japan, South Africa, Brazil, Argentina, China and Russia) and aims to design innovative nuclear systems to meet several criteria including economic competitiveness, safety and non-proliferation, and sustainable development (optimal use of natural resources, minimization of final waste).

Relaunch of the nuclear program

South Africa opted to develop its electricity production sector in a safe and competitive manner using CO₂ free technologies in order to support its economic and social growth. The country's ambitious energy program aims to create a lasting nuclear sector generating 20 GW of electricity by 2025 mainly from super modern water reactors and PBMRs.

South Africa wishes to become a world player in the nuclear energy field, thus reinforcing its position as one of the major world producers of energy.

In the strategic plan for the development of a national nuclear policy unveiled in July 2007, the government's objective is to create the suitable conditions for a nuclear industry based on the most modern technologies and promote an ambitious new builds construction program. By 2030, nuclear energy should provide 30% of electricity in South Africa, from a fleet of PWRs and PBMRs.

In 2007, ESKOM's Board of Directors approved a plan to relaunch the construction of electrical plants in South Africa, to reach around 80 GW by 2025 and including the construction of an additional 20 GW of nuclear-based capacity.

This nuclear revival program provides for the construction of PWR nuclear power plant generating a total of 3 GWe to 3,5 GWe, to go online as of 2016, and the consideration of a fleet of PWR power plants up to 20,000 MWe in total to gradually go on line through 2025.

Five sites have already been identified for the new power stations and the nuclear company to build the power plants will be selected in 2008. AREVA's Evolutionary Power Reactor (EPR) and Westinghouse's AP 1000 have been pre-selected.

PBMR project

South Africa considers the Pebble Bed Modular Reactor (PBMR) project to be a matter of national importance.

Designed by ESKOM based on new technology acquired in March 1989 from the purchase of a German patent co-owned by AREVA and Westinghouse, this low power reactor (150 – 200 MW) is modular: The production capacities of several units can be combined to reach the desired level of production. This type of reactor can provide both electricity and heat.

In 2003, the government approved the construction of a pilot pebble bed nuclear reactor at the Koeberg site and a pilot fuel plant at Pelindaba outside Pretoria.

Subject to conditions and approvals, construction of a PBMR demonstration plant and a pilot fuel plant is set to proceed during the year 2009. Commercial production is scheduled to commence in 2013.

South African authorities envisage constructing a fleet of 24 PBMR units for electricity generation with a total capacity of 4GWe between 2016 and 2030. One quarter of electricity in the RSA should be provided by PBMRs, subject to the success of the demonstration project.

The fuel cycle

Through its document “Nuclear Energy Policy and Strategy for the Republic of South Africa” published as a “Draft for public comment” in July 2007, the Government aims to achieve the objective of encourage the participation of Public entities such as the South African Nuclear Energy Corporation (NECSA) in the uranium value chain. Such public entities shall be used to store the secured uranium supplies, as well as participate in the local beneficiation.

In this extended programmed, NECSA, as the state’s body responsible for research and development in the field of nuclear energy, will play a vital role to:

- Be the anchor for the coordination of all nuclear energy R&D and innovation,
- Undertake and lead the development of uranium conversion capabilities ,
- Develop nuclear fuel fabrication capabilities and obtain established fuel fabrication technologies,
- Investigate the viability of building an indigenous reprocessing facility.

Already, NECSA has managed a low and medium level waste storage site in Vaalputs since 1986.

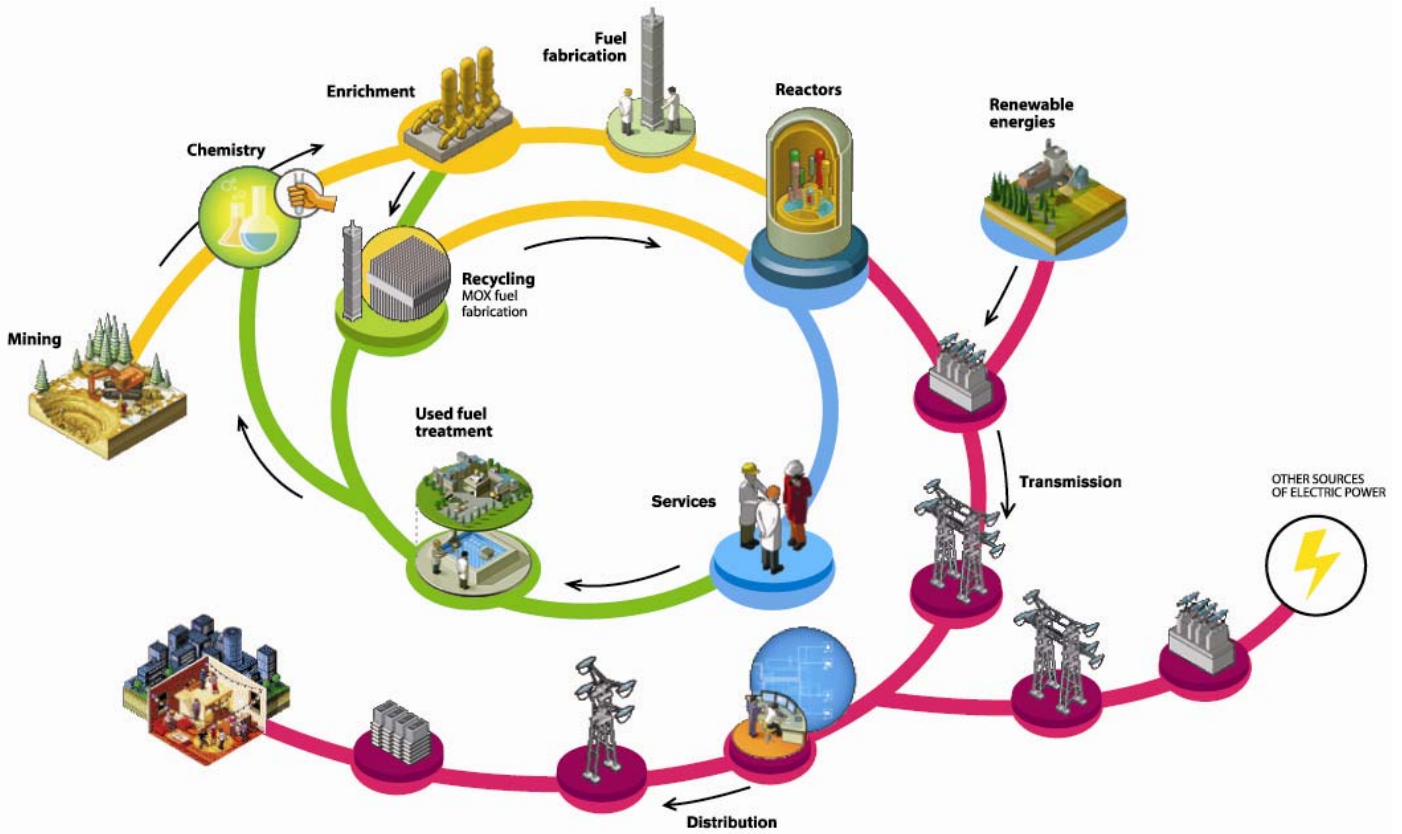
In 2005, the government issued the national radwaste management policy based on the recycling of used fuel and minimizing packaging and storage of waste volumes.

With regard to the **organization of the nuclear sector**, under a law from 1999 the Department of Energy and Raw Materials is responsible for legislation on electrical nuclear production and radwaste management. This responsibility was in turn delegated by the Department to NECSA.

The National Nuclear Regulator Act No. 47 of 1999 establishes the National Nuclear Regulator. (NNR) as the nuclear safety authority for South Africa.

With regard to non-proliferation, South Africa ratified the non-proliferation treaty in 1991 and the additional protocol in 2002.

AREVA'S UNIQUE INTEGRATED OFFER



A solution for each customer

Our customers' needs: generating, transmitting and distributing electricity

<ul style="list-style-type: none"> Secure supply to their reactors. 	<ul style="list-style-type: none"> Ensure facility operations and maintenance while optimizing their performance. Extend reactor service life. Build new generating capacity. 	<ul style="list-style-type: none"> Optimize the management of used nuclear fuel. Shut down nuclear facilities at the end of their service life. 	<ul style="list-style-type: none"> Ensure the continuity and quality of electricity transmission and distribution to the user. Manage grids, boost their capacity, ensure their reliability and provide energy market management.
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Our answers: supplying solutions for CO₂-free power generation and reliable electricity transmission and distribution

<ul style="list-style-type: none"> Uranium exploration and mining. Uranium conversion and enrichment. Nuclear fuel design and fabrication. 	<ul style="list-style-type: none"> Inspection, servicing and retrofitting of all reactor types. Heavy component design, manufacturing and replacement. Design and construction of nuclear power plants, including the EPR, and of biomass plants. 	<ul style="list-style-type: none"> Solutions for used fuel treatment and recycling of reusable materials. Solutions for used fuel storage. Facility decommissioning at the end of service life. 	<ul style="list-style-type: none"> Design, manufacturing and installation of high and medium voltage equipment and systems. Development and installation of grid control systems.
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Front End division	Reactors and Services division	Back End division	Transmission & Distribution division
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LOCALIZING NUCLEAR ACTIVITIES

AREVA, as the world leader in nuclear power and the only integrated company, has been continuously developing, manufacturing and investing in every segment of the nuclear power cycle and in electricity transmission and distribution.

By building over 100 new plants worldwide, **AREVA has an uninterrupted track record for new plants construction and an extensive experience in partnerships and industrial localizations.**

Proven track record of AREVA localizations worldwide covers every segment of the nuclear power cycle and relies on effective partnership models and localization methodology that AREVA has developed over years.

AREVA has at disposal in-house all engineering and manufacturing capacities as well as proprietary industrial processes in nuclear. This has been a decisive factor in AREVA's success in technology transfer, development of local skills, and localization of fabrications in several countries for the past 20 years (Korea, Japan, China, Brazil) and soon South Africa.

Furthermore, **every localization program must be tailored** to considerations of level of ambition, actual industry infrastructure, and requirements of the recipient country.

In consideration of the above as assets, AREVA has developed a methodology for successful localization partnerships based on an **efficient approach calling, not only on technology transfers, but also on a sustained technical back-up and assistance from our multi-national organization.**

When implementing preferably its models within long-term relationships, and applying our key success factors, AREVA has conducted all our localization programs with success and sustainability.

The industrial relationship between **AREVA and South Korea, China, Japan, Brazil, USA, Finland and South Africa has led to many major achievements in the nuclear sector** such as:

- reactor construction,
- development of manufacturing capacities to the nuclear grade activities for equipment and the fuel cycle,
- transfer of technology and knowledge,
- development of all necessary and various skills of workforce,
- participation of large and smaller local enterprises and
- Joint cooperation in research and development.

These major achievements were made of AREVA remarkable and extensive experience in partnerships and industrial localizations worldwide that AREVA proposes to share soon with South Africa on a comprehensive scope.

EPR BY AREVA: THE PATH OF GREATEST CERTAINTY

AREVA's EPR, the world most advanced and first Generation III+ reactor being built, provides to South Africa the path of greatest certainty for nuclear power to the grid on time. The three main great advantages of the Gen III+ EPR are the following ones:

- **Energy supply certainty:** the AREVA EPR fulfils with certainty growing energy needs in the short and long term thanks to:

- The EPR **evolutionary design** leveraging 1,300 reactors years of construction and operation experience, as well as the best of French and German reactor cooperation. EPR has a good pedigree and is a proven reactor. The EPR reactor is a direct descendent of the well-proven N4 and KONVOI reactors, the most modern reactors in France and Germany. The EPR was designed by teams from KWU/Siemens and AREVA, EDF in France and the major German utilities. The EPR integrates the results of decades of R&D programs, in particular those performed by the CEA (French Atomic Energy Commission) and the Karlsruhe Research Center in Germany. The EPR benefits from the experience of several thousand reactor-years of operation of pressurized water reactor technology. This experience has put 87 AREVA PWRs online throughout the world.

- The EPR large net electrical power (1,600+ MWe)

- The EPR design lifetime of sixty years

- **AREVA experience** from EPR licensing and construction projects, which ensures: **engineering certainty** for customers through evolutionary design, **licensing certainty** with construction license obtained in France, Finland and China, licensing launched in USA and UK, **procurement certainty** for critical components directly sourced from AREVA's existing integrated facilities, and **project certainty** with on going building experience and established supply chain.

AREVA has always believed in nuclear energy and has an uninterrupted track record for new plants construction, which speaks for itself in terms of project management and operational experience. AREVA has built over 100 new plants around the world and is a major player in maintaining and fuelling the existing nuclear fleet worldwide. EPR meets the "European Utility Requirements." This specification was drawn up by electricity companies in Belgium, Finland, France, Germany, Great Britain, Italy, Holland, Spain, Sweden, and Switzerland. The "European Utility Requirements" also make allowance for the specifications of operators in the United States, drawn up under the aegis of the Electric Power Research Institute (EPRI). Combined and construction and operating license is currently being reviewed and approved in the USA and China and pre-licensing is underway in the UK.

- An achievable industrial model for **fleet approach**.

- **Business performance certainty:** the AREVA EPR is **competitive** and optimizes the power generation costs through its lifecycle, such as:

- Optimized operation and maintenance costs

- Optimized plant efficiency: the axial economizer inside the steam generator allowing a high level of steam pressure, providing an electrical efficiency up to 37% depending on site conditions, the highest ever for light water reactors.

- Optimized fuel consumption: the EPR saves uranium and enrichment resources thanks to a flexible and optimized fuel management. For example thanks to: the neutron economy improved by a large core and heavy reflector, the optimized core power density, the increased fuel burnup, the fuel cycle lengths from 12 to 24 months, the In-Out / Out-In fuel management, ability to use recycled fuel and different types of fuel.

- Optimized plant availability: the EPR reduces outage durations in particular thanks to preventive maintenance during operation, larger set down areas for the storage of large service equipment and shorter shut down (due to faster cool down, depressurization and vessel head opening phases).

The EPR offers significantly reduced power generation costs, about 20% lower than those of large combined-cycle gas plants.

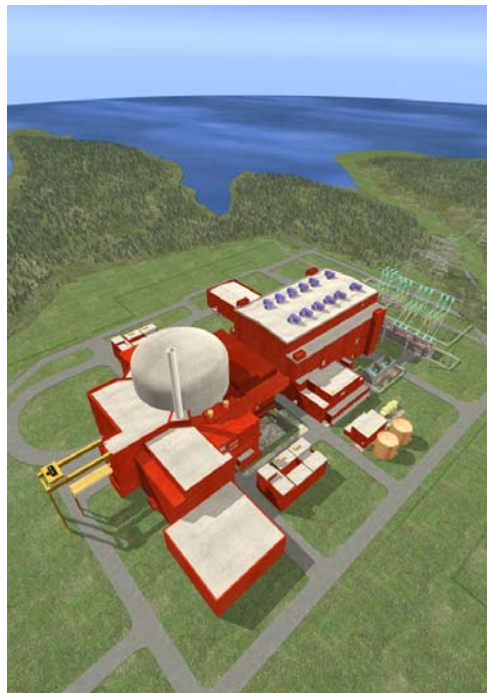
• **Sustainable development certainty:** the EPR is a **safe reactor** and a **key asset** for nations and for energy utilities to act as environmentally and socially responsible players, thanks to:

- The EPR outstanding safety level, optimally combining active and passive safety systems complying with the most stringent safety requirements

- The optimized consumption and recycling of nuclear fuel resources

- The EPR maximum output per site

- The EPR minimized environmental impact: the EPR reduces resource consumption and limits waste generation per CO₂ free MWh produced.



The main innovative features of the EPR evolutionary design are:

- The outer shell covering the reactor building, the spent fuel building and two of the four safeguard buildings, protecting from airplane crash
- The heavy neutron reflector that surrounds the reactor core lowers uranium consumption
- The axial economizer inside the steam generator allowing a high level of steam pressure and better plant efficiency
- The core catcher allowing passive collection and retention of the molten core in case of a reactor vessel fail in the very unlikely event of an accident with a core melt
- A digital technology and a fully computerized control room with an operator friendly man-machine interface, which improves the reactor protection system.

The unbeatable reactor safety of the EPR can be identified by:

- The core meltdown prevention: in the very unlikely event of a reactor accident with a core melt, preventive features to protect include the following safety devices: large water inventory of the primary system and steam generators, four subsystems (called trains) for major safety systems, each capable of performing the entire safety function on its own, diversity of safety systems allowing mitigation of events with total loss of a safety function, valves dedicated on the pressurize to prevent high-pressure core melt.

- Severe accident mitigation: the extremely robust containment around the reactor is designed to prevent radioactivity and its effects from spreading outside, the arrangement of the blockhouses inside the containment and the use of passive hydrogen catalytic recombiners prevent the accumulation of hydrogen and the risk of deflagration, in the unlikely case of a core meltdown, molten core escaping from the reactor vessel would be passively collected, retained and cooled in a specific area inside the reactor containment building.

- Radiological protection: radiological protection of operating and maintenance staff is enhanced thanks to the target collective dose of less than half the 1 man-Sv per reactor per year average currently observed in OECD countries.

- Protection against external hazards:

Airplane crash: the EPR provides particularly effective physical protection against extreme external hazards. The reactor building, the spent fuel building, two of the four safeguard buildings with the control room are protected by an outer shell made of reinforced concrete, thick enough to withstand the high-speed impact of a military or commercial aircraft. The other two safeguard buildings are located at opposite sides of the reactor building; similarly the diesel generators for emergency electricity supply are located in two different buildings also protected by geographical separation.

Earthquakes: the EPR is designed with large safety margins. The entire nuclear island stands on a single reinforced basemat, 6 meters thick. The height of the buildings has been minimized. The heaviest components, in particular water tanks, are located at the lowest possible level.

EPR in the international competition

The AREVA EPR is the first Generation III+ reactor technology that is currently being manufactured and locally built.

Two EPR are under construction on two sites:

- **France:** at Flamanville in the Normandy region for the utility EDF
- **Finland:** at Olkiluoto for the utility TVO.

In **China**, AREVA and the utility CGNPC signed on November 26th, 2007 the biggest contract ever in the history of nuclear power and entered into a long-term commitment. This record contract (8 billion €) is unprecedented in the world of nuclear market. Through a series of agreements, AREVA in conjunction with CGNPC will build two EPR reactors at Taishan site and provide all the materials and services required to operate them. An engineering joint venture will shortly be created. CGNPC agreed also to buy 35% of the production of UraMin, AREVA's subsidiary in the field of uranium production. At the same time, an agreement was signed between China and France opening the way to industrial cooperation in the back-end of the nuclear fuel cycle, notably for undertaking feasibility studies related to the construction of a spent fuel treatment-recycling plant in China.

In the **US**, several utilities have already chosen EPR technology. 7 projects are underway, including:

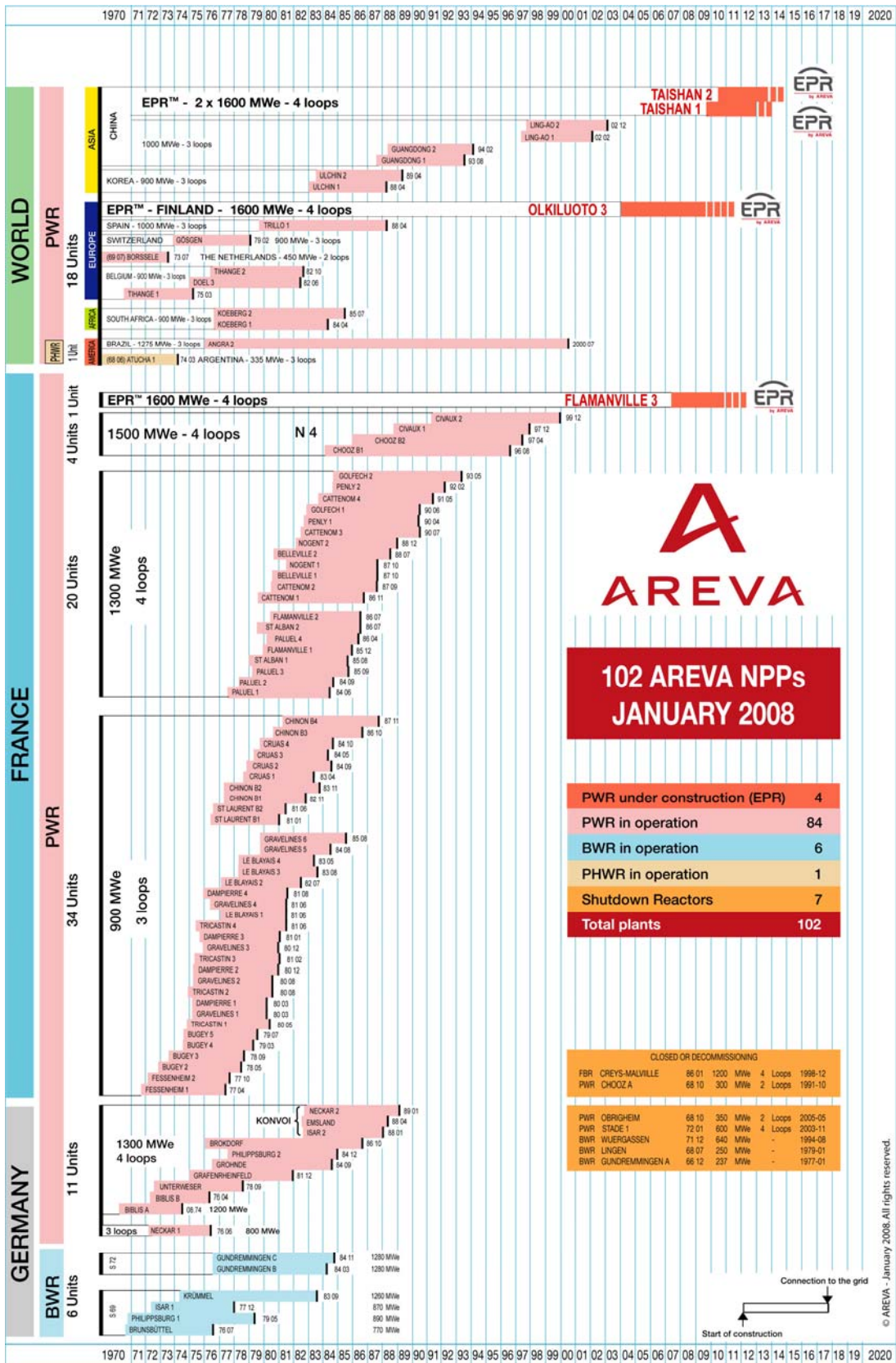
- Constellation: Calvert Cliffs (Maryland) and Nine Mile Point (New York)
- Amarillo power: Amarillo (Texas) (2 units)
- Ameren: Callaway (Missouri)
- AEHI (Alternate Energy Holding): Bruneau (Idaho)
- PP&L: Susquehanna (Pennsylvania).

The EPR design certification application has been put to the NRC on December, 11th 2007.

UniStar Nuclear, a U.S. joint venture established and jointly directed by Constellation Energy and AREVA, has the mission to promote, market, certify and build the EPR in the United States in order to develop a standardized fleet of reactors.

In the **United Kingdom**, on September 10, 2007, AREVA and EDF launched a joint website that presents the details of the EPR nuclear reactor. These details have been submitted to the UK regulators for generic design assessment. On January 10th, 2008 the British government announced the revival of nuclear power in the UK following a consultation process. The UK is a priority for AREVA. Eleven top European utilities are already supporting the pre-licensing of the EPR in the UK (British Energy, Centrica, E.ON, EDF, Iberdrola, RWE, Scottish&Southern Energy, Endesa, Suez, Union Fenosa et Vattenfall). AREVA's ambition is to build at least 4 and probably 6 reactors in the UK.

The 102 nuclear power plants by AREVA



AREVA SUBMITS IN SOUTH AFRICA AMBITIOUS GLOBAL OFFER

On January, 2008, AREVA submitted its bid in the Republic of South Africa (RSA) following the “Invitation to Negotiate” issued by ESKOM in November 2007.

The AREVA proposal covers the construction of two EPRs within the scope of the “Nuclear-1” program and possibly 10 other EPR within the scope of “Fleet” program. The proposal is accompanied by the first elements of a global partnership aiming at the joint development of a South African nuclear industry and related skills development.

AREVA: LEADER ON THE SOUTH AFRICAN NUCLEAR PRODUCTS AND SERVICES MARKET

AREVA achieved overall revenues of 94 million euros in South Africa in 2007, comprising 55 million euros in its Reactors & Services Division, 12 million euros in its Fuel Division and 27 million euros in its T&D Division in 2006.

Reactors

AREVA built the twin units of the Koeberg nuclear power plant. In 2006, the two reactors provided 10 TWh net of electricity, which represents 4.4% of the country’s total electricity production. Today AREVA is present in Koeberg in the fields of utility services, technical assistance and fuel supply.



Koeberg nuclear power plant

Services

Utility services mainly comprise inspection operations, maintenance, repair and component replacement as well as engineering and upgrading services.

In this field, current relations between AREVA and ESKOM are as follows:

- Five-year partnership following a multi-year contract signed in 2005 with ESKOM, for outage and engineering services, the supply of spare parts and permanent AREVA representation on the Koeberg site by a French team.
- Integration in AREVA teams of 150-200 local employees, mainly from LESEDI Nuclear Services, a local AREVA subsidiary, and the secondment of additional expats during unit outages for which AREVA has provided services since the commissioning of units 1 and 2.

LESEDI Nuclear Services, a South African subsidiary located near the Koeberg site, is the product of a longstanding partnership and commitment made by AREVA on the South African nuclear market. In 2001, AREVA (Framatome ANP at the time) bought a 45% stake in LESEDI Nuclear Services, followed by a further 6% stake in 2006, making it a majority shareholder with 51%. LESEDI Nuclear Services employs 200 people and fulfils BEE criteria. Thanks to its geographical and cultural proximity to the customer and its recognized skills, LESEDI Nuclear Services can rapidly respond to the demands of the operator. It has also created new jobs locally in various fields.

Recent highlights:

- 2006: AREVA holds a 51% stake in LESEDI Nuclear Services
- 2007: AREVA replaces the reactor vessel head during outage of unit 1
- 2007: AREVA wins a contract for phase three of the Koeberg 1 and 2 upgrade project.

Fuel

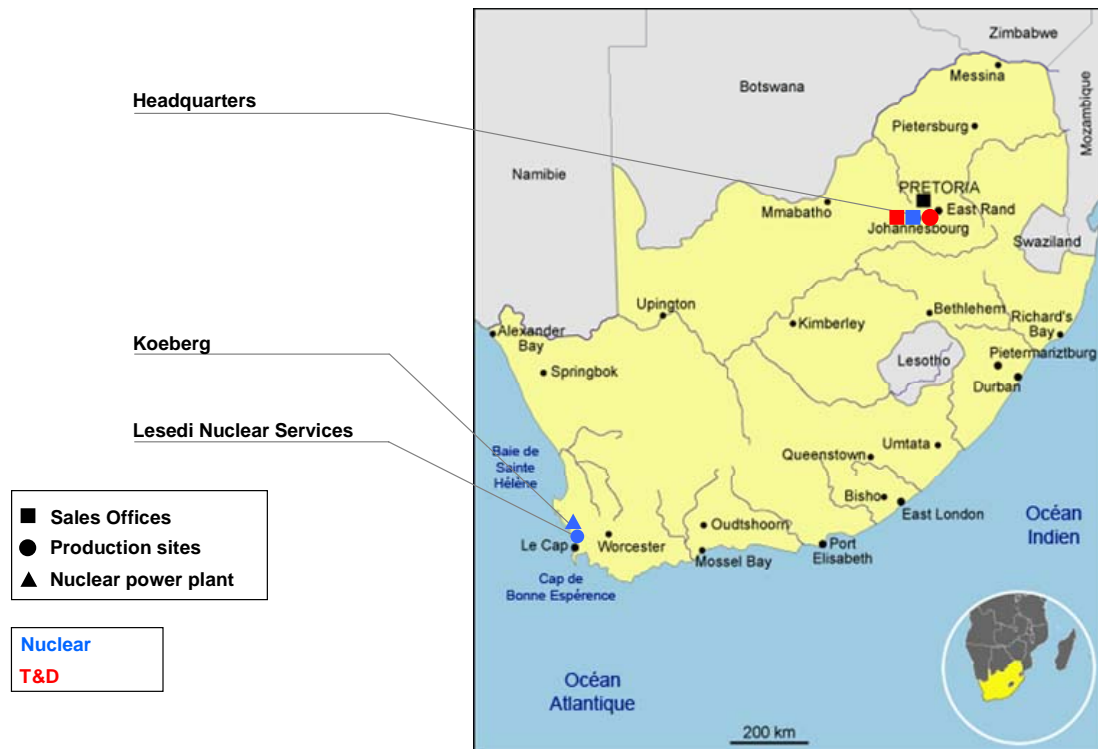
AREVA supplies fuel to the Koeberg nuclear power plant. The fuel contract runs until 2012/2013.

R&D

AREVA provides NECSA with technical support for the conversion and fabrication of low enriched uranium for the SAFARI research reactor. A MOU signed in early 2004 marked the start of a partnership between NECSA and CERCA, an AREVA subsidiary. AREVA provides technical support to NECSA for new conversion processes and fuel supply. Over the ten-year period NECSA needs to adapt its fabrication processes, it will purchase slightly enriched uranium from AREVA.

The cooperation programs will furthermore enable NECSA to implement the manufacturing of LEU fuel targets used for medical radioisotope, and the recovery services of AREVA fuel scraps.

AREVA's sites in South Africa



Education, Training and Societal commitments in SA

AREVA wishes to extend its relations in South Africa to more than simply developing its activities. AREVA is working with South Africa on training in the nuclear energy, mining and high-tech fields. Education and higher education are a major challenge for South Africa. Blacks have only recently been accepted in universities and access conditions are far from sufficient.

This is one of the reasons why in 2002, Anne Lauvergeon, AREVA CEO, spoke to Phumzile Mlambo-Ngcuka, Minister for Mining and Energy, about hosting interns in France. She also suggested creating a joint RSA/AREVA training structure.

An initial agreement signed with South Africa in 2003 brought the main South African nuclear bodies on board (departments of industry and trade, ESKOM, NECSA, NNR and PBMR). ARECSA was created in order to provide technological training to the nuclear community of South Africa. For AREVA, this agreement constituted the recognition of its involvement in the country and development aid it intends to offer.

In 2007, ARECSA launched the master program named "Project Leaders of South Africa", in cooperation with the South African Presidency, the Industrial Development Trust (IDT) and the Paris Sorbonne University.

In February 2008, at a ceremony with French President, Nicolas Sarkozy and South African President, Thabo Mbeki, AREVA CEO, Anne Lauvergeon and NESCA CEO, Rom Adam, signed an agreement that will see AREVA's support for engineering and nuclear skills development extended and increased.

- **Training in nuclear competencies**

ARECSA Human Capital, a joint venture between AREVA and NECSA¹, which provides training in technology and energy to previously disadvantaged South Africans, underlining the company's commitment to government's ASGISA and JIPSA initiatives, will grow rapidly.

Future cooperation between AREVA and NECSA also extends to the training of artisans through the NECSA Artisan Training Center and a Technical Training Center, which reopened this year to address the needs for artisans in the broader nuclear industry.

These agreements support AREVA's initiatives aiming at bridging the gap in nuclear skills necessary to build and maintain South Africa's Nuclear Program, such as:

- **Project Leaders program**

The Project Leaders program that has already trained skilled South African engineers at the Sorbonne and AREVA University will be extended for a further five years, with more engineers benefiting from the training.

- **Partnership with North Western University (NWU)**

This year, AREVA, in partnership with North Western University (NWU), will commence nuclear project management training at the university. The training targets at the SA nuclear industry executives and at NWU post-graduate students registered for nuclear engineering.

At that ceremony, AREVA CEO, Anne Lauvergeon said, *"Skills are critical if South Africa's nuclear industry is to succeed. Today we have extended our support to the Joint Initiative on Priority Skills Acquisition (JIPSA), and made another strong commitment to this vital area of the South African government's economic policy,"*

Societal commitments: AREVA, the NGO Pro-Natura International, and the South African company Necsa have been working together since 2003 on a project that combines energy and development to manufacture "green coal". By avoiding the use of wood, it protects the forests and eliminates methane emissions from the natural carbonization process.

HIV: AREVA help children and their family, infected with or affected by the AIDS virus, and support for the physically and mentally disabled

- In partnership with NGO SIDACTION, **AREVA supports the Groote Schuur Hospital's "Kidzpositive" program**, located near the Cap area. The new challenge of this project is the pediatric patient management. Kidzpositive was one of the first programs to provide access to pediatric treatment and comprehensive patient management for sick children. It has set the standard today for a global approach to patient management for families living with HIV/AIDS by offering mothers membership in an economic and social support unit and revenue-generating activities.

- At the same time, **AREVA also supports a program led by SECOURS POPULAIRE, near Johannesburg**, whose objective is to offer wellness activities to children aged 4 to 18 by setting up writing groups, theatre groups, drawing groups, etc. By allowing children to express their troubles, these groups are helping them to overcome them and to adopt a positive outlook.

Through initiatives such as these, AREVA is reaffirming its strong commitment to defining and establishing its contribution to the fight against AIDS in countries in which it does business, including South Africa, one of hardest hit by the pandemic.

AREVA'S T&D DIVISION: LEADER ON SOUTH AFRICAN T&D MARKET

South Africa's represents 1/3 of Africa's overall T&D market. Approximately €15 billion will be invested over the next 5 years to develop South Africa's power network and to ensure a reliable electricity supply. South African T&D market is a strategic objective for AREVA.

AREVA's T&D Division has been present in South Africa for over a century through its local partner, Alstom Electrical SA (Pty) Ltd, commercializing its high- and medium-voltage products as well as its automation systems. As a world-leading supplier of turnkey solutions for electricity transmission and distribution, the division is well positioned to tackle South Africa's booming T&D industry. Half of the installed transmission & distribution base in South Africa has been supplied by AREVA 's T&D Division & its local partner, Alstom Electrical SA (Pty) Ltd. AREVA provides South Africa with solutions to ensure a safe and reliable supply of electricity throughout the country.

Recent key references are the following ones:

- In 2007: Increase in ESKOM Distribution market share for Automation frame contracts to >40% and a leading company for installation of substation systems.
- In 2006-2007: Frame contracts with ESKOM Transmission for the supply of 765 kV Live Tank Circuit Breakers and 400 kV & 765 kV. Disconnectors that will equip new substations for extra high-voltage network.
- In 2004-2007: Frame agreements with ESKOM for the supply of high and medium voltage surge arresters. In total some 177,000 surge arresters have been delivered to the customer.
- In 2004: Supply of a new SCADA and Energy Management System to ESKOM for the National Control Centre in Johannesburg and at the Standby Control Centre in Witbank, East of Johannesburg. This contract enables ESKOM to better control electricity flows and reduce transmission power losses.

NORTH AND SOUTH AMERICA

17% of sales

% OF SALES BY BUSINESS

Nuclear 67% / T&D 33%

MANUFACTURING OPERATIONS

Argentina, Brazil, Canada, Chile, Columbia,
Mexico, United States, Venezuela.

12% of employees

EUROPE AND CIS

62% of sales

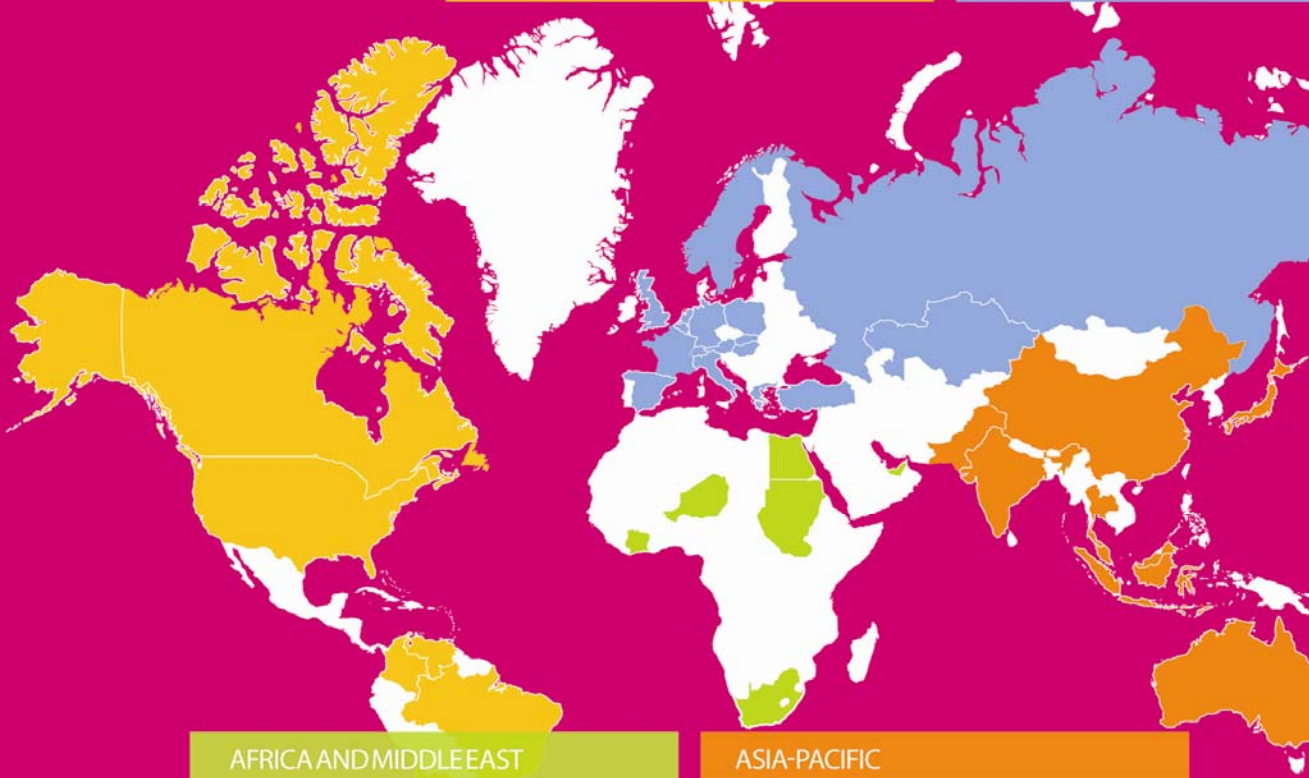
% OF SALES BY BUSINESS

Nuclear 76% / T&D 24%

MANUFACTURING OPERATIONS

Austria, Belgium, France, Germany, Greece,
Italy, Kazakhstan, the Netherlands, Norway,
Russia, Slovakia, Spain, Sweden, Switzerland,
United Kingdom.

73% of employees



AFRICA AND MIDDLE EAST

7% of sales

% OF SALES BY BUSINESS

Nuclear 9% / T&D 91%

MANUFACTURING OPERATIONS

Côte d'Ivoire, Egypt, Niger, South Africa, Sudan,
United Arab Emirates.

4% of employees

ASIA-PACIFIC

14% of sales

% OF SALES BY BUSINESS

Nuclear 47% / T&D 53%

MANUFACTURING OPERATIONS

Australia, China, India, Indonesia, Japan,
Malaysia, Pakistan, Singapore, Thailand.

11% of employees

MAIN ACRONYMS

- **DME : Department of Minerals and Energy**
- **NECSA : Nuclear Energy Corporation of South Africa**
- **NNR : National Nuclear Regulator**

APPENDIX

- ***Energy balances of non-OECD countries***, International Energy Agency, 2007.
- ***The BP Statistical Review of World Energy***, 2007.
- ***Nuclear Energy Policy and Strategy for the Republic of South Africa***”, July 2007.
- ***Nuclear Power in South Africa***, site web <http://www.world-nuclear.org/info/inf88.html>, World Nuclear Association, December 2007.
- ***Country Analysis Briefs - South Africa***, Energy Information Administration, Department of Energy, USA.
- ***Nuclear Energy Policy and Strategy for the Republic of South Africa***, Department of Minerals and Energy, July 2007.
- ***ESKOM Annual Report***, 2007.

With manufacturing facilities in 43 countries and a sales network in more than 100, AREVA offers customers reliable technological solutions for CO₂-free power generation and electricity transmission and distribution. We are the world leader in nuclear power and the only company to cover all industrial activities in this field.

Our 65,000 employees are committed to continuous improvement on a daily basis, making sustainable development the focal point of the group's industrial strategy. AREVA's businesses help meet the 21st century's greatest challenges: making energy available to all, protecting the planet, and acting responsibly towards future generations.

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Energy is our future, don't waste it!

