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## **RELIABLE AND SUSTAINABLE: TOWARDS A NEW IMAGE OF NUCLEAR ENERGY**

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It is a real pleasure for me to speak in front of you, only three days after the formal creation of AREVA. With the merger of CEA-Industrie, COGEMA and Framatome operations, AREVA group now provides services for every aspect of nuclear power generation and for every customer of connectors and interconnection systems.

I have been quite impressed, so far, by the generally favourable response from the international media. We all are indeed quite used to mixed press reports, to say the least, on nuclear topics. But times are changing, and it is in fact quite striking that, according to a well-respected British journal's recent article, the only "shadow" on the launch of AREVA would come, not from its well-recognised nuclear activities, but from the current downturn on the communications market...

Times are indeed changing for nuclear energy and for our industry. As representatives of that industry, we all are convinced already that nuclear energy is necessary to satisfy future world energy needs. But today, there is a great opportunity to be seized by the nuclear industry:

- Energy supply once again raises quite crucial questions in most countries; and governments are re-considering the need of nuclear contribution, in the USA as well as in the European Union.
- More and more people are recognising the positive features of nuclear energy, such as its availability, reliability and sustainability.

I will develop these two observations. However, we have to admit that not all stakeholders consider this energy to be acceptable. Our duty is to convince decision makers outside our circle. Several challenges remain ahead of us. I will suggest some perspectives and actions that could help us overcome the hurdles.

Let us first examine the new favourable context.

## **1. Compelling needs: energy security plus climate change mitigation**

Recently, the need for energy supply security has returned to the forefront in Europe and in the USA:

- In the European Union, the Commission's Green Paper "Towards a European Strategy for Security of Energy Supply" warns against the growing energy dependence of the Union, which will rise from 52 % today to beyond 70% in 2020 if we continue the current trend, and calls for urgent counter-actions. The sudden oil price increase in 2000, after the depressed cycle in the preceding years, has reminded us how sensitive to energy imports the European economies remain, and of the need to master the volatility of energy indices.
- In the USA, the shortage of power supply in California has been recognized as the most prominent demonstration of a more generalised situation: after merely 10 years of under-investment, shortages of increasing amplitude are occurring for electricity generation. In response, President G.W. Bush adopted a proactive energy policy to increase supply capacities, including a fair amount of new nuclear capacity.

Moreover, the massive and growing needs of the developing countries will not be satisfied. World energy consumption is forecast to double by 2050.

At the same time, updated evaluations of the climate change threat have been published by IPCC experts. The prognosis is scaring. Temperatures could rise between 1.4 and 5.8 °C by 2100, if we do not drastically control carbon emissions. Beyond the dryness of the figures, a lot of people are concerned in their day-to-day lives, especially in the developing countries.

This dilemma of rising energy supply needs against the need to reduce carbon emissions will find no realistic answer without a significant contribution of nuclear energy.

Last July in Bonn, this reality did not force its way through the lengthy and difficult Ministerial discussions of COP6. But careful reading of the agreement shows that nuclear energy is not completely excluded in the application of UNFCCC.

We can obtain better outcomes from COP7. A crucial condition for that is a change in the composition of national delegations. The action to mitigate climate change should not be limited to the competence of Environment Ministers, but should also involve the Ministers in charge of industry, transport and finance.

A still more important appointment will perhaps be the Rio+10 Conference next year, where nuclear energy will have to be recognised as a component of sustainable development. That means that we have to fight and develop more intensive lobbying, and WNA should be a central pillar in that. We have to offer more information to governments, demonstrating the positive features of nuclear energy.

Let me mention some of them.

## 2. Some attractive features of nuclear energy

### *i. Available and reliable*

For the consumer, the security of supply involves several conditions: permanent and unlimited access to the source, no black outs, reasonable and predictable prices. Nuclear energy ensures that all those conditions are fulfilled. Nuclear energy is available now, on a permanent basis, at a high rate of consumption and delivery, for a long time.

Mrs Loyola de Palacio, Vice-President of the European Commission, declared that “*nuclear power energy is emerging as an unavoidable energy source to guarantee the greater stability and lower vulnerability of our economies*”. Several arguments come supporting her statement:

#### **First, the extent of the natural resource.**

#### **Second, the small cost of natural uranium in the price of electricity.**

As of today, the price of natural uranium is 8%, at most, of the generation cost. A 50 % rise in the price of yellow cake would result in a tariff increase of only 4 %, whereas in the case of oil or gas it would be around 38 %. That means predictable costs and no threat of a price jump for the power consumer and for decision makers investing in new projects.

#### **Third, the low mass flows and volumes involved.**

Remember, 1 tonne of uranium can produce as much energy as 14,000 tonnes of coal. Currently, importing countries can easily store the equivalent of 2 to 3 years of consumption. In the oil industry, storage in the European Union countries covers only 3 months of consumption.

#### **Fourth, reliability and safety.**

These have always been main objectives for utilities and nuclear operators. High reliability benefits productivity as well as safety. From the beginning of nuclear electricity, Western technology based reactors have accumulated nearly 10,000 years of commercial operation.

#### **Fifth, high availability factors.**

The availability factor of nuclear power plants has been continuously improved, reaching a world average of 79% in 2000, against 65% in 1990. Since nuclear plants are usually operated as a base load, their contribution to overall production is bigger than their share of installed capacities: in the European Union, nuclear power produces 34% of the electricity with 20% of the installed capacity.

*ii. Sustainable*

Sustainable development challenges us to deliver economic development, environmental quality and social equality—all at the same time. Sustainability must be viewed as a continuous process that takes those three aspects into account simultaneously.

Ecosystems are finite and vulnerable, their capacity as sinks and sources is limited. In that perspective, nuclear energy has strong environmental advantages:

- **CO<sub>2</sub> equivalent emissions** for the entire nuclear fuel cycle (including materials for construction) reach about 10 g/kWh, which is the same as for wind power. Comparable figures for the fossil fuel cycles are between 450 and 1,200 g/kWh.
- **Land use** is small in comparison with other energy sources.
- **Health impacts** are much smaller than for other energy sources. A major indicator is the loss of life expectancy, calculated as the number of Years Of Life Lost (YOLL), resulting from the exposure to the emitted pollutants. On that indicator, nuclear performance is ten times better than coal and three times better than gas.

**The positive aspects of nuclear energy that I just recalled are a matter of fact, but they are not sufficiently known or recognised. I reiterate here my call for the creation of a world energy database, which perhaps could be managed by OECD's competent agencies, highlighting the pros and cons of each energy source.** Such a database should leave aside no alternative and involve all the criteria for decision: earth resources, cost efficiency, health and environmental impacts, long-term consequences, etc...

The energy policy debate will benefit from such factual data. They will provide a good basis to design a well-balanced energy mix for the future.

### **3. Three major challenges**

Nuclear energy will remain a major component of the world energy mix if we are able to meet three major challenges.

#### **First, competitiveness.**

There is no question about the competitiveness of the now operating nuclear power plants. But under what economic conditions can new nuclear units be built?

Recent national assessments in 1999 and 2000 have concluded positively for the competitiveness of new nuclear capacities: in Belgium, Finland, France, Japan, and South Korea. The closest competitor of nuclear is gas in the Combined Cycle Turbines (CCGT) in Europe; in North East Asia, it is coal.

One main determinant of the decision is how the capital cost issue is handled: since the investment cost accounts for more than 50% of the total generation cost for nuclear, instead of 20% for gas turbines, nuclear power competitiveness will be hampered by a high rate of interest, a required high rate of return on equity, or a high risk premium related to financiers' risk aversion. Investment choices result from a choice between different risks. In their wider approach, large power companies take into account other risks besides high capital cost, such as gas price volatility and the potential cost of carbon emissions. In Europe, gas supply will remain reliable and affordable only if heavy investments are made for new gas fields and transport lines from Russia.

However, all energy technologies are improving their performance; and the nuclear industry must minimise its generation costs.

**The newly formed industrial group AREVA mobilises all the necessary know-how required for maximal efficiency. AREVA is strongly committed to the cost optimisation of nuclear reactors, with Framatome ANP, and the nuclear fuel cycle, with COGEMA.**

Competition between gas, coal and nuclear will remain a strong incentive for progress. We have to design advanced concepts, proposing a more efficient combination of reactors and nuclear fuel cycles and an optimal waste reduction and management system. The challenge here is R&D financing. It can imply international joint programmes to share the burden.

### **Second, the waste issue**

Waste disposal appears still now as the most serious public concern about nuclear. Finland last year was first country in the world to find a definitive outcome. We have to make this case more well known and to extend this first success.

I am personally convinced that more dialogue and stakeholder involvement in the decision process will help us.

A rational management of resources in the case of nuclear energy was and remains the central reason why spent fuel reprocessing and recycling were implemented. On one hand, plutonium recycling in LWRs is now current industrial practice and prepares the way for more extensive recycling in fast reactors; reprocessed uranium has been recycled in several countries; and more generally, several intermediate uranium stores along the fuel cycle (e.g. depleted uranium, reprocessed uranium) can be considered as mines for the future. On the other hand, ultimate waste is contained in stable and tight confinements, and only limited volumes of such waste must be disposed of, resulting in very small and localised risks.

### **Third, transparency and communication.**

The importance of public understanding should not be underestimated. Nuclear energy remains feared and suspicious. Past misunderstandings weigh on our present image.

We must listen to the people if we want them to listen to us.

COGEMA has therefore adopted an innovative policy of transparency. Through the Internet, the public can get the information it wants about our nuclear operations. Web cameras enable anyone to see live what happens at La Hague, our reprocessing plant, and in MELOX, our MOX fuel fabrication plant. Information on plant performance and environmental monitoring is available on our website. In 2000 we had more than 200 000 connections. All our industrial sites are open to visitors: for example, we receive each year more than 12,000 visitors at La Hague.

Inside the AREVA Group, the extension of Intranet organisation and communications will make staff more informed and involved, as they are key for external relationships. And attacks by anti-nuclear groups will not change our attitude: they will rather reinforce our resolve and our commitment to more transparency.

## **Conclusion**

I have only quickly examined some challenges facing us.

We are confident that we can maintain nuclear competitiveness. And a well-balanced mix of energy sources can be regarded as more robust by the power companies and by the consumers. The real barriers to nuclear investment will lie rather in social acceptance, the waste issue, regulatory swings (safety standards) and delays.

More transparency and improved dialogue with stakeholders is possible, coupled with an extended social assessment of all the pros and cons for each energy technology. Then everybody will see nuclear energy as it is: available and reliable, sustainable and affordable. Let us make it not only more acceptable, but also more friendly. Let us improve our communication and our lobbying, let us especially work for the 2002 World Conference on Sustainable Development, Rio+10. This is our common challenge, at home as well as through a rejuvenated World Nuclear Association.

Thank you for your attention.