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Prospects for Nuclear Power in the 21st Century

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This is a vast subject. Within the European Union, the contribution of nuclear energy has been fully recognised: it provides 35% of our electricity. However, its future role often gives rise to passionate debate. Indeed, it can be said that the subject has been taboo for a long time within the European Commission. And so I am pleased to be here to highlight the new context which we, at the European Commission, see emerging from our recent works in this domain.

The Euratom Treaty creates an obligation for the Commission to promote the conditions to allow the rapid growth of nuclear energy. The original Treaty has achieved quite remarkable success: research, safeguards, and the Euratom Supply Agency. In parallel, industry invested to achieve the present level of contribution of nuclear energy to our energy balance. However, the accident at Three-Miles Island in 1979 followed in 1986 by the Chernobyl accident, against the background of a strong political campaign against nuclear weapons during the Cold War, brought about important changes in attitude. The reduction of energy prices, the availability of natural gas as an alternative source of fuel and the feeling that security of supply constraints were relaxing all led energy policy makers to promote other energy vectors. At the same time, and because of these developments, we witnessed the emergence of a strong opposition to nuclear energy in some Member States.

The approach of the European Commission has also been influenced by this situation. This culminated in a policy which recognised the full application of the subsidiarity principle: Member States develop their own specific policies on the types of fuel for electricity production. Also, at a Community level, reform of the energy markets and the development of environmental protection policy became major lines of policy.

However, the Vice President of the Commission, Mme Loyola de Palacio, as soon as she took over the energy and transport portfolio, pointed out forcibly that the underlying conditions were changing in terms of market structure, the geopolitical situation and environmental challenges. Therefore, she argued, the policy at EU level should take these new conditions into consideration.

Major issues

- There is a strong relationship between energy and sustainable development. The Treaties place sustainable development as one of the core tasks of the European Community, and so the policy to reduce CO₂ emissions has become a priority. However, emissions are still growing. The forecasts of the European Environment Agency, under “business as usual” scenarios, predict a 5% increase by 2010 in such emissions, instead of the reduction to which the European Union committed itself at Kyoto. If no action is undertaken, then emissions from transport will increase by 50% between 1990 and 2010. These figures have tremendous importance in our discussion today since they put the real challenges into perspective.

In this context, any reduction of the nuclear share in electricity production looks contradictory to our global objective of CO₂ emissions reduction. Even if we keep nuclear output at its present levels we must still make huge efforts to reduce energy consumption, to promote renewable energy sources and to mitigate CO₂ emissions from the use of fossil fuels.

- Security of supply is back on our energy agenda. In a liberalised market there are no easy ways to dampen price increases brought about by physical or political shortages. Price shocks hit energy users – citizens or industry – directly and inflation hits almost immediately, leading to harmful macro economic consequences. The Green Paper adopted in November 2000 by the European Commission points out that our increasing dependency – from a present level of 50% to a possible level of 70% in 2020 - reduces flexibility and exposes our economy.

As recent studies – for example, in Belgium and France – have shown, nuclear plays a strong role in security of supply. It is true that under the current scenario, nuclear energy would decrease its share in supply by 2020 due to the closure programmes in Germany and other countries. Nevertheless, Finland has recently embarked on the process which could lead to building its fifth nuclear unit.

It is clear that it would be unwise to neglect nuclear’s potential to create the conditions for the European Union to fulfil its obligations both in terms of security of supply and sustainable development.

Is the future for nuclear bright?

If nuclear has the potential to contribute to the EU energy balance, one must also take into consideration the new environment in which it will have to operate.

- The liberalised market will soon - I am convinced - prevail over the whole continent. Nuclear may be handicapped by the magnitude of the capital investment that it requires and by its long construction times. Nuclear power is also heavily regulated and must meet what appears to be a diverse and ever increasing number of safety requirements.

Nevertheless, most of the existing nuclear plants are well placed in liberalised markets and they often have a competitive advantage there. Nuclear has proved in the recent past that it is capable of sustaining competition, and it has improved its record in terms of production availability while continuing also to meet a high standard of safety. We have surely a lot to learn from current developments in the US, where improvements in performance have been so clear. Also in the US, the concentration of market players - a process which is also going on in Europe - will result most probably in fewer companies with mixed portfolios of sources of generation.

- Nuclear energy is generally regarded with suspicion by public opinion. The military origin of much of nuclear technology explains largely why, in the past, it was far from being the most transparent of sectors. This culture seems now to be changing, but the public is apparently still not convinced. It still feels that it is poorly informed about nuclear issues. The independent nuclear regulatory bodies, in addition to helping to promoting high levels of safety, have an important role to play in communicating with the public. But they are not alone. Industry, government agencies and other organisations can - and should - enter the debate and play the card of transparency. The European Commission's Green Paper encourages a reasoned, dispassionate debate on the future role of nuclear power. The UK Energy Review will, I hope, help to further improve the level of communication and to promote confidence in this sector.
- Even more of a problem might be the perception by the younger generation that nuclear is a declining sector. Maintaining its position will require the nuclear sector to invest in new technologies. It must also communicate its successes to younger people and attract them back into the sector.

I am convinced that the nuclear industry has the capability to resolve these issues. But the first step is to persevere in adopting a culture of openness, showing the general public that there is nothing to hide. In particular, I think that the nuclear industry now has an opportunity to open a dialogue with all its stakeholders to determine the conditions of its operation as well as to make clear its contribution to a cleaner environment and a more competitive economy.

Major issues for the future

The Commission has referred in its Green Paper to other issues, which have a direct impact on the individual citizen's perception of the potential of nuclear energy potential to cover our future needs.

- Enlargement is for tomorrow. This means the fulfilment of a major goal for the European Union. Regarding nuclear, it means also having on EU territory several reactors of Soviet design. Some of them have safety deficiencies: they must be closed as soon as possible. Others are upgradable: this upgrading should be financed by the sector through normal market mechanisms.

During recent months, Member States and the Commission have worked to define a basis to ensure that, at the time of accession, the candidate countries will have achieved high levels of nuclear safety. This work has also created the conditions for a bottom-up approach towards an increased “harmonisation” of nuclear safety regulations and practices in the European Union. The Commission is ready to cooperate in the continuation of this process in which our Member States must continue to play a major role.

- Electricity exchanges will increase within the European Union and with its neighbouring countries. In parallel, a level playing field should be developed both in relation to conditions for environmental protection and for nuclear safety, including that of spent fuel and radioactive wastes.
- **THE LINK BETWEEN A FUTURE FOR NUCLEAR ENERGY AND THE MANAGEMENT OF RADIOACTIVE WASTE, ESPECIALLY THE LONG TERM MANAGEMENT OF THE HIGH LEVEL RADIOACTIVE WASTE, IS AT THE CENTRE OF ANY DISCUSSION ON NUCLEAR ENERGY. THE GREEN PAPER STATES THAT “NUCLEAR ENERGY CANNOT DEVELOP WITHOUT A CONSENSUS THAT GIVES IT A LONG ENOUGH PERIOD OF STABILITY THIS WILL ONLY BE THE CASE WHEN THE WASTE ISSUE FINDS A SATISFACTORY SOLUTION WITH MAXIMUM TRANSPARENCY”.**

There is a very broad consensus on the concept of geological disposal for such wastes. The necessary technologies have all been tried and tested. Research and development will continue to refine data, models, and concepts related to the long-term safety of disposal. The experts have no doubt that we could dispose safely of wastes today, and that there are now no technical reasons to delay decisions on disposal. Radioactive waste exists. We generated it. We must manage it. If we are not to pass our waste on to future generations, we should also dispose of it.

But there continues to be opposition from large sectors of the public to most proposals concerning the siting of repositories. Given this, it is increasingly difficult to get political support for— or even political decisions on — such sites. This failure to advance to the next stage in the waste management process reinforces the public’s initial suspicions and resistance. In turn, this makes political decisions even harder. The spiral continues. Major efforts will be required to change its course. The Commission has urged Member States to work closely together and to make progress towards siting, construction and operation of repositories. In this context, we warmly welcome the decision of the Finnish Parliament in May this year.

Nuclear’s future role

To contribute to a global reflection about nuclear power in the 21st century we have, I think, to admit that, at first glance, significant investment in new nuclear power plants within the EU is unlikely in the near future. In many parts of the EU, the electricity market has an overcapacity, and extending the lifetime of existing nuclear plants will in any case limit the need to build new ones. This is not the situation everywhere, and new nuclear capacity might be looked for soon in Finland and perhaps also in some candidate countries.

In the medium term – from the beginning of the next decade - if the policy to fight CO₂ emissions is enforced, the environmental and economic advantages of nuclear power for base load electricity production should give it a chance to maintain its contribution and to reverse the trend towards closure. Industry might have to look to less capital-intensive technology. The European Pressurised-water Reactor (EPR) and other designs are available, and some of these have already been licensed. Such developments will also be influenced by price increases for competing natural gas. In that time horizon it will become clear if climate change is confirmed as a real and serious threat. If that is the case, the prospects for nuclear will improve significantly because the reduction of CO₂ needed will be of the order of 60 to 70% of present levels and not just 8%.

Nuclear energy has strong advantages which should permit this energy to contribute significantly to our energy needs. It is essential to the European Union that European industry is in position to compete both within the EU and in external markets.

In my view, given nuclear's long lead times, I would suggest that, beyond 2020, new fission technologies now being developed will have to be deployed. Their ultimate acceptance will depend on their cost effectiveness and their ability to produce less waste while maintaining a high level of nuclear safety and proliferation resistance. Fusion continues to be a prospect for the future, but here progress is dependent on political will and long-term financing. Indeed, the European Commission still believes in this technology, although intensified international co-operation is needed due to the magnitude of the efforts required.

Finally, as a conclusion, I would like to point out that whatever our thoughts may be about the future of nuclear energy, we cannot exclude the possibility that technological progress in other sectors could significantly impact on the nuclear sector. What might be the consequences of an overall conversion of the transport sector to cars powered by fuel cells? In that case which technologies will generate the massive demand for hydrogen? The answers to these and other questions are not easy. Depending on your views about the forces which create changes in our society, answers might be different. But, in any case, nuclear energy will almost certainly be a part of the equation and in the European Commission's view, it is not an option that mankind can afford to put aside.