INTERNATIONAL NUCLEAR SOCIETIES COUNCIL - INSC

Providing for Our Energy Future While Protecting our Environment

A Statement by the International Nuclear Societies Council

May 2006

To assure the sustainability and reliability of the world's long-term energy supply, the International Nuclear Societies Council (INSC)* calls upon the G8 Heads of States and Governments to encourage the deployment of advanced nuclear power stations and pursue an aggressive international development program of fast neutron reactors to assure future long-term uranium supply and efficiently manage nuclear wastes.

At the Gleneagles meeting, in July 2005, the Heads of States and Governments of the G8 countries acknowledged the clear and present danger of climate change due to the release of greenhouse gases (GHG) in the atmosphere in the course of human activities and notably of the burning of fossil fuels, oil, coal and gas, which today account for 80% of the world's primary energy consumption.

Energy is the life-blood of survival and development. Studies carried out under the auspices of the UN agencies WHO and UNDP have underlined that without minimal access to energy, there is no human development, sustainable or not. In 2000, 6 billion inhabitants of planet Earth consumed the energy equivalent of 10 billion metric tons of oil (10 Gtoe). In 2006, 6.5 billion people will consume 12 Gtoe, and yet 1.6 billion have no access to electricity. By 2050, 8 to 9 billion human beings will probably consume annually between 15 and 18 Gtoe.

Where this energy will come from is an unanswered question. Fossil fuels, especially oil and gas, even though they currently provide a dominant fraction of the world's energy, are finite resources that even now are showing signs of supply restrictions and price increases. Furthermore, a policy of continued dependence on fossil fuels would be unsustainable because of the negative, possibly disastrous, impact on the environment.

Accommodating the needs and aspirations of a growing global population, while at the same time cutting by half the world's emissions of carbon dioxide, will prove a formidable challenge - but we must face it or expose mankind to unacceptable risks. The stakes are huge and the time is now. Only a full array of measures can meet such a challenge. These measures include:

* *The INSC represents nuclear engineers and scientists from around the world.*

1. Control the energy demand in the industrialized and emergent nations by aggressively increasing energy efficiency and promoting thrifty ways of life;

2. Increase, within the diversified energy mix, the share of those energy sources that emit very little CO_2 during their life cycle, namely nuclear power and renewable energies, which, together, account today for a mere 10% of the world energy production (another 10% is supplied by traditional biomass, the contribution of which is unlikely to increase);.

3. Implement wherever reasonably feasible carbon sequestration at those facilities which emit large amounts of CO_2.

Conservation and renewables are the politically easy solutions to support. However, nuclear energy, despite the fact that it now provides 16% of the world's electricity cleanly, does not have international support as a way to help meet our future energy and environmental needs. It is urgent to realize that, while nuclear, by itself, is not *the* solution, there is no realistic solution at all *without* nuclear power.

Countries that have the capability to use nuclear power safely and economically, but have elected to forgo this use, are actually emitting more CO_2 into the environment than needed, and consuming more fossil fuels than needed. They are depleting resources and putting pressure on fuel prices, to the detriment of those poorer and less industrialized countries for which nuclear power is not yet an option. The INSC calls on those countries to seriously reconsider their policies and priorities, to encourage greater development of safe nuclear energy, and to support strongly the efforts of other governments to do the same.

Today, nuclear power is devoted almost exclusively to generating electricity. New types of reactor design under development could open the field to non-electrical applications, notably transportation through clean production of hydrogen, and desalination. Currently 97% of the energy used for transportation comes from oil.

Today there are several new types of advanced reactor ready for deployment—designs that have improved safety and economic performance. In addition, there are smaller advanced reactors under development that are suited for developing nations that do not need large nuclear power stations. Should the deployment of nuclear power stations expand as expected, care must be taken that its development be sustainable, and not limited by uranium availability.

Nearly all current power reactors are "thermal"— they use thermal neutrons, and therefore extract less than 1% of the energy in the mined uranium. The remainder of the energy is left unused in the spent fuel and in the depleted uranium that remains after uranium is enriched

for use in thermal reactors. With known fast-neutron reactor technology, this unutilized energy can be harvested, thereby extending a hundredfold the energy extracted from the same amount of mined uranium. Spent fuel from thermal reactors and depleted uranium from the enrichment process can be utilized in fast-neutron reactors; the energy that can be extracted from this alone would be sufficient for several hundred years without additional mining.

Fast neutron reactors with advanced fuel cycle facilities also can recycle transuranic elements, thus reducing significantly the long-lived radioactive waste and therefore facilitating the acceptability of radwaste disposal sites.

To assure the sustainability and reliability of the world's long-term energy supply, the International Nuclear Societies Council sees an urgent need to deploy safe and proven thermal-neutron reactors and to commit to an international program to develop fast neutron reactors and advanced proliferation-resistant fuel cycle facilities such that the long-term energy contribution from clean nuclear power can be assured.

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