Report to the 51st Regular Session of the IAEA General Conference from the 10th Scientific Forum

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Forum Chair: Honorable Gareth Evans
President, International Crisis Group
Former Minister for Energy and Foreign Minister of Australia

Mr. President,

This year's Scientific Forum, with 250 specialist participants meeting in the margins of this General Conference in this 50th Anniversary year of the IAEA, was given the daunting task of exploring and reporting back to you on how the world's nuclear energy future might unfold over the next 25 years, and how in this context the Agency might best advance its mission of ensuring the peaceful, safe and secure use of that energy source.

As the Forum Chair, I was given the even more daunting task (thankfully with much helpful input from the very professional scientific staff of the Agency and the session moderators) of distilling for you, in terms that you will find both interesting and of some practical utility, the content of 25 excellent presentations, spread over two full days, and involving four major sessions on, respectively, the future of nuclear power in meeting the world's energy needs; new roles for nuclear technology in food, agriculture and health; meeting the challenge of safety and security in nuclear infrastructure; and – most challenging of all – holding the line against weapons breakout through effective safeguards and verification.

Bearing in mind the Director-General's comment in opening this Conference that 'the role of the Agency is not so much to predict the future as to plan and prepare for it', the focus of my report will be a little selective. Although this necessarily means giving less than deserved attention to a number of contributions that were rich and thought provoking – including, e.g., on the future of fusion research - I want to put the emphasis on those conclusions and recommendations emerging from the Forum discussion that have direct relevance for the role of the IAEA rather than the world at large. What does the Agency need to be doing, or planning, that it is not doing at the moment? And of what it is doing, what does it need to do more, better or differently?

To the extent that we came up with answers to these questions, they grew out of a number of what seemed to be commonly accepted starting points:

- First, the overall world demand for energy is going to grow dramatically over the next 25 years, probably by around 50 per cent or even more, with two-thirds of that increase occurring in developing countries.

- Second, pressure is going to grow for a very substantial part of that demand to be met by non-fossil fuels, and in particular by nuclear energy. It is just not sustainable for 80 per cent of the world's energy supply to come from fossil fuels, as is the case at the moment: rising oil prices, energy security concerns due to the geographic concentration of oil and gas reserves in the Gulf States and Russia, and of course global warming environmental concerns will all see to that.

- Third, there will be continuing strong demand to apply nuclear technology to the world's needs, and in particular developing countries' needs, in health, food, agriculture and industry. An important part of this story is not just the need for more readily available nuclear technology in its application to human and animal health, to agricultural crop development and preservation, and to industrial uses: it is also the potential need in the longer term for massive additional amounts of energy for desalination plants to meet ever growing water shortages.

- Fourth, while there is thus a major opportunity for the rapid further development of nuclear energy, there is still a high level of uncertainty as to what extent that opportunity will actually be taken up over the next quarter century, for three main reasons: the huge capital cost of most nuclear infrastructure (which is a significant disincentive to developing countries, not least with the current World Bank policy of not investing in nuclear power); the acute shortage of trained human resources and the associated lack of regulatory and technical infrastructure (particularly again in many developing countries); and the political difficulty of making rapid advances given continuing public concern about safety, security and proliferation.

- Fifth, the pressure for nuclear weapons proliferation is not going to go away. It remains something of a miracle that the prediction widely made in the 1960s that there would by now be at least 20-30 nuclear weapon States has not been realized, and it cannot be assumed that this miracle can be sustained – particularly when the nuclear weapons States remain so conspicuously indifferent to their own obligation under Article VI of the NPT to take serious continuing steps toward nuclear disarmament.

Against this background, a variety of enhanced and in some cases new roles for the IAEA were identified in the presentations and subsequent exchanges. They can be grouped under four headings:

Making Nuclear Energy More Affordable and Deliverable

- The Agency has an important role to play in assisting its Member States, and particularly developing countries, in energy planning. As more States contemplate nuclear power, with all the immensely complex infrastructure that requires – in terms of legal and regulatory capability, educated and trained manpower, a stable electrical grid, access to financial and industrial resources, and development of an appropriate safety culture – that role can only increase, and more resources should be allocated accordingly.

- The Agency may have a useful role, with constructive third-party analysis of planning options, in assisting States in particular regions to collaborate in building and operating a nuclear power plant: some of the more technologically developed (and in some cases oil-poor) countries of the Middle East and South East Asia were mentioned as ones possibly interested in such an exercise.

- Financing the huge upfront capital cost of major nuclear power plants is a major burden for developing countries. While not having, or needing to have, any direct financing role, the Agency can play a useful technical support role in compiling information, assembling experts, working with international financial institutions such as the World Bank, and generally helping to communicate opportunities and options to interested Member States.

- The IAEA, together with established nuclear power countries, should continue to assist States in meeting the immense challenge of building the human resources needed to support nuclear power operations. Expanding the capacity of colleges, universities and nuclear research institutes for intensive training of nuclear specialists, assisting countries to send personnel abroad for training, and providing continuous education and on-the-job training activities within nuclear industry are all areas in which the Agency can play an enhanced role.

- On issues related to research and development of nuclear energy technology, there was a general view that the Agency should give policy support to efforts to close the fuel cycle

to the extent that this can be done in ways that enhance the sustainability of nuclear energy systems, decrease the amount of waste requiring management, and help to reduce rather than increase proliferation risks.

Making Nuclear Technology More Readily Available

- The IAEA should continue and if possible increase its activities on the transfer of technologies, training, capacity building and the more efficient use of nuclear and nuclear-related technologies in human health and agriculture, including normative support (e.g. guidelines) to national counterparts and other organisations (e.g. OIE, the World Organization for Animal Health).

- The IAEA should build on its existing outstanding collaboration with the FAO, and increase it with other international organisations such as the WHO, OIE, and UNIDO. Since sustainable agricultural development will only be achieved if market driven and profitable, it is also important for the Agency to broaden its collaborative network to more actively include the private sector.

- The Agency should use specific nuclear technologies and molecular biology knowledge to develop better diagnostic agents and tools - including the use of non-invasive stable isotopes for tracing - to prevent and control diseases and pests of importance in plants, animals and humans.

- Given the need for cancer to assume a higher priority on the global health agenda, and the role of the Agency's Programme on Action for Cancer Therapy (PACT) in this area, the Agency should continue and strengthen PACT and its ability to help its Member States raise funds, and plan and build national cancer control programmes with national guidelines adapted to local needs.

- Given that the role of radiotherapy will still be essential in cancer care over the next 25 years, the Agency should continue to assist its Member States in upgrading radiotherapy centers and training professionals. In this area, as in others, it should explore the potential of information technology for distance learning.

Responding to Nuclear Safety and Security Concerns

- The IAEA has a critical policy leadership role to play in building, for a future generation of new nuclear power plants, a robust safety and security global regime and the associated infrastructure that can guarantee long term attention to safety and security. Such a regime needs to be based on sharing state of the art scientific and technical knowledge, and operational information in areas such as nuclear facility decommissioning, waste management, and the transport of radioactive materials. The Agency should continue to be the focal point for this global regime by maintaining and perfecting its safety standards, encouraging compliance and helping to foster strong national regulatory structures.

- The IAEA also needs to be concerned with the current fleet of nuclear power plants some of which fall behind in safety performance either due to limited resources for upgrades, lack of awareness of the deficiencies, or simply because of complacency and a lack of proper safety culture. The chains of nuclear safety and security are no stronger than their weakest links and those who are lagging behind need to be given priority attention and help.

- The new generation of reactors that will be designed and constructed in the next 25 years will operate along with many of the current 438 operating reactors worldwide. The regulation of safety and security should not shy away from forcing shutdown of old (or indeed new) reactors in cases where this is ever considered necessary. It will be necessary to keep under continuous review the safety of nuclear power plants and, as appropriate, upgrade safety culture, plant hardware, procedures and emergency preparedness plans.

- In this regard, the Agency should also plan to increase the frequency and scope of its international peer review missions of regulatory bodies and the safety performance of power plant and other nuclear facilities.

- Since technically sound and publicly acceptable waste management practices are essential the IAEA's work and assistance in this area will also continue to be indispensable, as will the construction and putting into operation by States of waste disposal facilities, in particular for spent fuel and high level waste.

- In the area of sealed radioactive sources, the IAEA could help States with: the proper identification of sources through the establishment in all countries of accurate up to date national records; the regaining of control over orphan sources; and, importantly, the development of associated security measures.

- Given that even with a stringent global safety regime there will be incidents and accidents, emergency preparedness plans will need to address such eventualities. The IAEA should enhance its role in coordinating international radiological and nuclear emergency planning, preparedness and response, helping States to prepare for and respond to emergencies through setting standards, developing binding international conventions, organising international peer reviews and further developing an international system of emergency preparedness.

Responding to Nuclear Weapons Proliferation Concerns

- The Agency's verification system does not exist in a vacuum. It is inextricably connected to, and is an indispensable component of, the wider arms control and non-proliferation regime. Disarmament and non-proliferation are two sides of the same coin. Therefore, the sustainable strengthening of nuclear verification must be accompanied by sustained cuts in nuclear arsenals and the implementation of further steps towards a nuclear weapon-free world.

- Given that public confidence in effective nuclear verification is likely to be a precondition for the significantly expanded use of nuclear energy, it is important that the IAEA continues to fulfil its verification responsibilities credibly by perfecting its safeguards system and applying it in an impartial and objective manner.

- IAEA verification will only be able to provide credible, impartial information to decision makers that would not otherwise be available, if its inspectors are provided adequate authority, are aided by all available information, backed by an effective compliance mechanism, and supported by international consensus.

- States with relevant non-proliferation undertakings should support the IAEA's work in this regard by bringing into force the safeguards agreements they have committed to and conclude Additional Protocols with the Agency in order to provide the IAEA with the required legal authority for its verification work. Only then will the IAEA have the basic

tools it needs to draw safeguards conclusions about the absence of undeclared nuclear material and activities. In some cases, e.g. where there has been a pattern of less than cooperative past behaviour, there may well be a need to seek investigative authority going beyond the Additional Protocol.

- Lessons must also be drawn from the discovery of covert nuclear supply networks, and relevant information furnished to the IAEA to assist the Agency in drawing its safeguards conclusions. Supply-side controls offer some promise of raising the costs and risks of would-be illicit suppliers, and the Agency should explore ways to build agreement on controls of this nature which would not unnecessarily hinder the development of peaceful uses.

- The expansion of the use of nuclear energy will only be possible if the proliferation risk created by the further spread of sensitive nuclear technology such as enrichment and reprocessing is minimized. The Agency needs to continue its work in trying to build consensus on the establishment of an international fuel bank or the development of other acceptable international arrangements aimed at guaranteeing nuclear fuel supply and avoiding the need for the development at the national level of full fuel cycle capability with the inherent proliferation risks that poses.

Mr. President,

Throughout the deliberations of the Scientific Forum there was a strong sense that the matters we were discussing were at the cutting edge of the international public policy debate – with widespread current concerns about energy security, about the environmental impact of fossil fuels and renewed fears about a new surge of nuclear weapons proliferation making the whole constellation of issues about both the peaceful and non-peaceful uses of nuclear energy more alive and important than they have been for many years. There was a recurring hope evident in the presentations that policymakers would be willing to think hard about whether present policies and institutional structures and resources were really up to the multiple challenges the international community was now facing.

I discerned throughout our deliberations a great respect for the role and competence of the IAEA right across the range of its mandate, and great confidence in the organisation's leadership. I am sure that the Agency, with the support of its Member States, will justify that confidence by

looking carefully at our conclusions and recommendations, and continue to work hard – in an international environment that is becoming ever more challenging – to maintain a reputation for professionalism and independence that is second to none in the family of international institutions.