Nuclear non-proliferation, Civilian Nuclear Energy, and Energy Security

WORKING GROUP #2 FINAL REPORT

This short report highlights the main topics of discussion among the members of the working group and presents a series of recommendations for Pugwash to consider in the development of the future portfolio of initiatives.

The approach adopted by the working group to explore the issue of nuclear non-proliferation and the global governance of the nuclear fuel cycle is a systemic one. While specific cases of proliferation crises such as North Korea and Iran continue to demand international attention, the group has directed its efforts to analyze more structural issues and global trends that in the near future might impact severely the Nuclear Non-Proliferation Regime and undermine its efficacy and credibility. The changing nuclear energy market, the prospects for the emergence of new nuclear technologies and the problematic and ever-changing relation between nuclear energy and climate change will bear understudied repercussions on whether the demand of nuclear energy will continue to grow around the world. Understanding and exploring the relation between peaceful use of nuclear energy and its proliferation risks is of the utmost importance today in order to prevent future crises.

The group identified and discussed four main global trends:

First, the nuclear order is witnessing both institutional crises and break-through: On the one hand, new institutions are emerging to address specific weaknesses embedded in traditional institutions such as the NPT. The inauguration of the LEU Nuclear Fuel in Astana, Kazakhstan is certainly an important concrete step towards the real internationalization of the nuclear fuel cycle, although its scale remains uncertain and rather unpredictable at the moment. The members of the working group noted that internationalization so far is limited to nuclear suppliers, through the Nuclear Fuel Bank and the Nuclear Supplier Group. But it is plausible to think that new internationalization schemes might emerge in the near future also among nuclear customers particularly in the sharing of fuel fabrication services. In addition participants have noted that this nuclear fuel bank is completely owned and managed by the IAEA and this fundamentally changes the nature of the IAEA from a verification organization into a middle-man in the international nuclear fuel cycle. On the other traditional institutions like the NPT and the Nuclear Supplier Group are facing deepening crisis of identity and legitimacy. The institutional impasse within the NPT between NWSs and the rest of the member-states has been one of the main drivers behind the negotiations of a Nuclear Weapons Ban Treaty, outside of the NPT Review Conference process. Similarly, the Nuclear Supplier Group is now struggling to cope with the increasing globalization of the nuclear energy market.

It is critical for the international community to reaffirm its unequivocal support to the Nuclear Non Proliferation Treaty in particular and to the nuclear nonproliferation regime more broadly. Such commitment should also be followed by specific and concrete steps to curtail the development of technologies and policies that might lead to the undermining of the nuclear nonproliferation regime.

Second, while previously western dominated, the nuclear energy market is now increasingly led and influenced by Asian powers including China, South Korea and Russia. The recent bankruptcy of Westinghouse and the uncertainty surrounding the future of AREVA/FRANCE have led experts to discuss of a "meltdown of the western nuclear industry". The shift in the geography of nuclear supplies is important for more than one reason: 1). It has altered the way in which nuclear power plants have been financed, from private investments to state-to-state subsidies 2) It has allowed for the development of new unexpected geopolitical alignments (for instance Russia-Turkey and China-Pakistan) 3) it has begun to undermine the credibility and the homogeneity of key global institutions such as the Nuclear Supplier Group;

Third, **the nuclear fuel cycle is undergoing significant changes.** New nuclear technologies are gradually emerging and might become commercially viable. Technologies such as Small Module Reactors (SMRs) and Molten Salt Reactors are now beginning to emerge as technologies that might allow the global nuclear industry to be more economically competitive vis a vis renewable energies. These new technologies will impact the current safeguards system in significant ways and will demand the IAEA a revision of current verification and monitoring procedures and systems so as to make them more adaptable to the new nuclear technologies. In addition, attempts to limit the spread of highly sensitive technologies such as enrichment and reprocessing have intensified especially in the aftermath of the Iran nuclear crisis. Global discussions over the establishment of enrichment-free regions or multilateral facilities have increased over time together with efforts to measure and curb nuclear latency. Working group members examined the possibility of preventing "nuclear latency" through the developing a series of indicators that could help government and civil society organizations to track countries' nuclear trajectories. These instruments would complement (but not replace) the comprehensive verification system that the IAEA is successfully implementing.

Fourth, energy security will encourage countries to pursue a more diversified energy portfolio. The future of nuclear energy at the global level will be remarkably affected by the diffusion and adoption of renewable energies. There is little doubt that the progress on these technologies has been fast and significant, however disagreements exist among participants on whether this progress will be sufficient to force a complete decline and collapse of the nuclear industry at the global level. Some participants argued that nuclear energy will continue to remain economically unviable and that what drives a country towards nuclear energy is simply "techno-nationalism" and the prestige that the country might draw from acquiring nuclear power plants. However others participants have noted that renewable energies still have not solved the problem of intermittency, and that storage of energy produced by renewable sources continue to constitute

a major technical challenge. Because of the complexity of predicting and addressing national energy needs, it is critical for countries to base their energy policies on accurate, rigorously tested and verified scientific and technological knowledge. In addition such policies should be as inclusive as possible and conceived through inter-disciplinary and inter-generational dialogues.

Recommendations

Based on this rich and inclusive discussion, the working group members would like to recommend Pugwash to undertake the following activities

a. To convene a workshop to explore "emerging countries views on nuclear and renewable energies" and to include a discussion on the costs to consumption and lifestyle that ought to be faced if the international community wants to tackle the problem of climate change;

b. To call on all nuclear newcomers to develop a nuclear waste and decommissioning plan before they undertake any specific step towards the development of a national nuclear power program;

c. To convene a series of workshops among scientists and policy-makers to investigate what type of solutions to the storage and/or disposal of nuclear waste might be more viable today;

d. To conduct an investigation on the future of the safeguards regime, most specifically on the incentives that can be given to member-states to support new safeguards standards and guidelines in line with the development of new technologies and the expanding role of the IAEA;

e. To urge all nuclear stakeholders (including government, nuclear industry, communities and other parties) involved in the nuclear fuel cycle to commit to act transparency and to be fully accountable to the general public and to the international community as a whole.