POLARIS

SPECIAL ISSUE

NATO SCHOOL

March 2009

NATO'S ROLE IN A CHANGING ENERGY ENVIRONMENT:
The Case of Nuclear Renaissance

BY KATARINA HANUSOVA
Visiting Research Fellow, NATO School

NATO SCHOOL
Research Department
Am Rainenbichl 54
82487 Oberammergau
GERMANY
URL: www.natoschool.nato.int
E-mail: RPD@natoschool.nato.int

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Editorial

The past twelve months have been a roller-coaster year in the energy markets, seeing record oil prices crash with the economic crisis and gas disputes erupt again in Europe causing widespread outages. One result of such volatility and uncertainty, both of which had been increasing over the past several years, is a renewed interest in nuclear power.

With energy security slated to hold a high profile at next month's anniversary summit in Strasbourg and Kehl, Katarina Hanusova examines the implications of this issue for NATO from a new perspective. Rather than focus on critical hydrocarbon infrastructure protection or gas politics, Ms Hanusova points out that the civil nuclear renaissance carries its own implications for the Alliance and for global security generally.

Nuclear infrastructure is indeed vulnerable to attack, and security regimes are often lacking. But the increased risk of technology, expertise, and material proliferation which necessarily results from expanded civilian use adds a new dimension to the interplay between energy and security policy. Existing regulatory frameworks have been described as fragmented and insufficient, raising question as to a need for greater coordination or even a new overarching regime.

The new American administration has made clear the strong connection it sees between civilian energy developments and security policy, and NATO itself has been seriously mulling its role in energy security since 2006. Ms Hanusova's timely commentary on the civil nuclear dynamic offers scope to enrich those debates.

This paper is the result of the NATO School's ongoing cooperation and research exchange program with the Ludwig-Maximilian University in Munich. Ms Hanusova is currently completing her Master's thesis and resided in Oberammergau during the preparation of this work with the generous support of the NATO School command. I would like to extend my thanks to the LMU for the continued success of this academic exchange program.

Phillip Cornell

Senior Fellow and Director, International Initiatives

NATO's Role in a Changing Energy Environment: The Case of Nuclear Renaissance

Introduction

Since the end of the Cold War, the North Atlantic Treaty Organization (NATO) has experienced radical change. While throughout the Cold War period NATO's mission was limited to the maintenance and defence of peace and territory, the end of that conflict opened up space for new initiatives. These aimed at the improvement of political relations with non-western countries and coping with new challenges arising from the changing security environment.

Energy security has long been an issue of global economic and security concern. The oil price shocks following the geopolitical tensions in the Middle East in the 1970s and 1980s, as well as the catastrophic events at Three Mile Island and Chernobyl, serve as lucid illustration. Yet despite these events, NATO's involvement in energy security in the past was limited to ensuring security of energy supplies for the purpose of military operability. In recent years, daunting developments have shaken energy markets and indeed international affairs, causing energy security to become an issue of greater importance to the members of the Alliance. A slow but growing departure from the long-standing belief that market regulatory forces alone could sufficiently guarantee security against all troubling energy concerns prompted NATO to put the energy issue onto the political agenda.[1]

This paper aims to show that while NATO has increasingly recognized the need to deal with energy as a security issue, the debate about where it could add value has focused mainly on a very particular aspect of energy security, namely the assurance of fossil fuel supplies. By doing so, NATO risks focusing on immediate energy risks only, without addressing the issue in its entirety and all accompanying security challenges. Thus the following article highlights various ongoing developments which are yielding a new energy security environment, but identifies nuclear renaissance as a significant cause of future security concerns. It will be argued that if NATO wishes to add truly substantial value, its debate on energy security must become more receptive to the wide range of security challenges.

After recognizing some critically dangerous aspects of the emerging nuclear renaissance, and highlighting a few ongoing initiatives aimed at reducing energy security risks, this paper identifies the need to address nuclear energy security and proposes NATO's added value.

NATO's Energy Security Debate

The first official remark addressing the relevance of energy security was made in the 1999 Strategic Concept. This stated that "Alliance security interests can be affected by other risks of a wider nature, including the disruption of the flow of vital resources."[2]

However, it would be several more years before the Alliance began to actively consider the issue of energy security again. At the Riga Summit in 2006 the Heads of State and Government made the first move towards defining a coherent approach and a consistent policy on energy security.[3] In the Riga Declaration, the Allies affirmed that they "support a coordinated, international effort to assess risks to energy infrastructures and to promote energy infrastructure security. With this in mind, [they] directed the Council in Permanent Session to consult on the most immediate risks in the field of energy security, in order to define those areas where NATO may add value to safeguard the security interests of the Allies and, upon request, assist national and international efforts."[4] Consequently, numerous discussions, workshops and forums have been initiated to find out what NATO's contribution in energy security could look like in practice. A brief review of the results of these different initiatives was presented at the Bucharest Summit in 2008, where the Allies agreed on taking a more active role and outlined several fields for possible action. The proposed actions included: "information and intelligence fusion and sharing; projecting stability; advancing

[1] Khamashuridze, Z. (2008) Energy Security and NATO: Any Role for the Alliance?, In *Connections The Quarterly Journal*, Vol. 7, No. 4, p. 53

[2] NATO, (1999) *The Alliance's Strategic Concept*, [available online: http://www.nato.int/docu/pr/1999/p99-065e.htm] [last accessed 12 January 2009]

[3] Legendre, T. (2008) *Energy Security, a new NATO issue?*, [available online: http://www.nato.int/docu/speech/2008/s080116b.html] [last accessed 12 January 2009]

[4] NATO, (2006) *Riga Summit Declaration*, [online available: http://www.nato.int/docu/pr/2006/p06-150e.htm] [last accessed 12 January 2009]

international and regional cooperation; supporting consequence management; and supporting the protection of critical energy infrastructure." [5] The Allies further declared that NATO's contribution intends to be entirely coordinated and entrenched within the initiatives of the international community. This note attempted to mitigate the growing fears accompanying the NATO energy debate, resulting from potential danger of westernizing and militarizing the energy issue.

In 2006 for instance, Russian Foreign Minister Sergey Lavrov openly criticised energy security talks at the Riga Summit, arguing that energy security issues which impinge on everyone should be discussed in international forums that include all the key players.[6] Others pointed out that substantial involvement of the Alliance in matters of energy security could negatively affect the relationship with producer countries by incorporating an ostensibly confrontational element.[7]

To understand the controversy around the NATO energy debate, it is necessary to distinguish between the two most common, yet incomplete understandings of energy security. Whereas consumers define energy security as secure access to adequate, affordable and reliable energy supplies, producers on the other hand associate it with sustainable demand at acceptable prices. What both (but especially consumers) tend to forget is that they are bound by mutual interdependence, and thus similarly vulnerable to any event that impacts on, or results from, energy consumption. Simply, no single country can consider itself entirely secure. Therefore, it would be irrational to dismiss support of any willing legal international body, including NATO.

However, despite the progress achieved at the Bucharest Summit, the Alliance is still far from developing a coherent approach to energy security. Apart from external skepticism over NATO's involvement in energy security, there has been an ongoing internal dispute. The diverging nature of Allies' energy interests, as well as their different ties and dependence on producer countries, made it very difficult for the Alliance to continue moving forward in defining its role.

High expectations are placed on the upcoming NATO Summit in 2009, where an update of achieved progress, including a set of further concrete initiatives is to be presented in a consolidated report.[8] Until then, it can be argued that so far NATO's evolving policy and debate on energy security has been characterised by particular attention to securing the transport of oil and gas, and other forms of critical energy infrastructure protection (CEIP). While understandable due to the heavy reliance of the Allies on fossil fuels, this narrow view may soon prove to be short-sighted especially in the context of ongoing developments. These include building environmental concerns, the depletion of vital natural resources, growing demand in the developing world and advancing economies (like China and India), price volatility, and energy supply instability. Much of the recent supply and price instability has in turn resulted from the increased use of energy as a political weapon, rising energy nationalism, political instability within many transit and producer countries, and terrorism. It is generally accepted that under such circumstances, the global trend of greater reliance on hydrocarbons is not sustainable. According to data from the 2006 BP Statistical Review, global proven oil reserves are estimated at about 1,200 billion barrels. Based on current projections, these reserves could last for about 41 years. Similar conclusions were drawn for the world proven gas reserves, estimated at around 179.8 trillion cubic meters and projected to last for 65 more years.[9]

Changing Energy Security Environment

States are increasingly aware of this situation and have put great effort in searching for other viable (and often environmentally acceptable) alternatives. Renewable sources of energy are often presented as the hope for future energy security.

According to the World Energy Outlook 2008, renewable energy is expected to play an

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[5] NATO, (2008) *Bucharest Summit Declaration*, [online available: http://www.nato.int/docu/pr/2008/p08-049e.html#energy] [last accessed 12 January 2009]

[6] Smith, M. A. (2007) *Russian Foreign Policy: A Chronology October – December 2006,* Defence Academy of the United Kingdom [online available: http://www.da.mod.uk/colleges/arag/document-listings/russian-chronologies/a-russian-chronology-october-december-2006] [last accessed 13 January 2009] p. 56

[7] Cornell, P. E. (2007) Introduction, In *Energy Security and Security Policy: NATO and the Role of International Security Actors in Achieving Energy Security*, p.4

[8] Legendre, T. (2008) Interview, In *ATA Newsletter*, Spring/ Summer, p.4-5 [online available: http://www.ata-sec.org/downloads/newsletters/ata_newsletter_spring_summer_08.pdf] [last accessed 13 January 2009]

[9] BP Statistical Review of World Energy, (2006), quoted In *HoC Library Research Paper 07/42 (2007), Energy Security*, p.17-18 [online available: www.parliament.uk/commons/lib/research/rp2007/rp07-042.pdf] [last accessed 13 January 2009]

increasing role in the world's primary energy mix. However, given the prospects that world energy demand will expand by 45% to 2030,[10] renewable energy will hardly be able to meet a substantial portion of that demand at current development pace.

In developing countries particularly, the luxury nature of renewable energy becomes clear. While nuclear energy costs only 0.25 - 0.6 cent/kWh to produce, solar energy costs 50 – 80 cent/kWh and wind between 5.5 - 13 cent/kWh.[11] In Africa, where in 2005 nearly two-thirds of its population had no access to electricity[12], governments are particularly likely to opt for cheaper and more reliable forms of energy over renewables. As the Czech Ambassador-at-Large for Energy Security suggested, it is nothing but *"wishful thinking"* to believe that countries with a constantly increasing demand for energy and a strong wish to catch up with social and economic standards of the developed world, will opt for these costly and comparatively less efficient forms of energy.[13]

Given the uneasy energy situation, countries across the globe have shown a renewed and growing interest in nuclear power. According to the Nuclear Energy Agency, there is particularly strong public support for nuclear power plant construction in China, India, Russia, Ukraine and the US.[14] The EU on the other hand seems to be divided. While many member states and the European Commission support a "substantial contribution" of nuclear power to the EU energy strategy, countries like Belgium, Germany and Sweden form a skeptical opposition and are committed to phasing out their reactors. However, it is likely that even such strong opponents may reverse their positions. This was the case in Italy, which recently decided to put an end to its moratorium on new nuclear power and has since expressed an interest in constructing new reactors. Minister for Economy Claudio Scajola described the original decision to phase out nuclear power plants as a "terrible mistake, the cost of which totalled over €50 billion".[15] He listed cost competitiveness, reduction of dependence on fossil fuels and meeting the challenges of climate change to be the crucial factors leading to Italy's decision.

The estimates of the UN Intergovernmental Panel on Climate Change suggested that CO2 emissions, including those from electricity generation, would have to be halved to bring the negative effects of climate change to a sustainable level. In order to do so, states would have to adhere to very strict CO2 emission levels by reducing the use of fossil fuels and increasing the use of carbon-free technologies. Nuclear power remains the only available technology to achieve such significant results. Conversion to nuclear power also offers the lucrative strategic benefit of reducing supply security concerns. In the short term, uranium's high energy density demands less transport and storage capacity, rendering the supply chain less vulnerable to disruption. In the medium term, most of the world's uranium ore deposits are situated in politically and socio-economically stable countries. And in the long term, global uranium deposits are less scarce than those of fossil fuels in terms of potential energy yield.

Such redeeming qualities of nuclear energy have been encouraging governments to discover or indeed relearn its benefits. As of January 2007, there were 435 nuclear power plants; another 29 reactors were under construction; 64 projects were planned; and around 158 were under consideration.[16] Thus, barring major deviations from current trends, the role of nuclear power can be expected to increase significantly over the next decades.

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[10] IAEA, (2008) *World Energy Outlook 2008: Options for a Cleaner, Smarter Energy Future*, p.4 [online available: http://www.iea.org/Textbase/speech/2008/Tanaka/cop_weosideeven.pdf] [last accessed 13 January 2009]

[11] Cardon, S. S. (2006) *Project 22: An efficiency comparison between wind and solar energy*, p.19 [online available: http://www.fh-nordhausen.de/fileadmin/mediadaten_fhn/Daten_Internationales/ipw_2006/praes/AP_22_Shelton_Cardon.pdf] [last accessed 13 January 2009]

[12] ElBaradei, M. (2008) *Addressing the global energy crisis*, p. 1 [online available: http://www.iaea.or.at/NewsCenter/Transcripts/2008/cfm061008.pdf] [last accessed 13 January 2009]

[13] Bartuška, V. (2007) A Non-Implicit Luxury. What 'Energy Security' Really Means", In *International Issues & Slovak Foreign Policy Affairs*, Vol. 16, No. 4, p. 3 – 7.

[14] NEA, (2008) *Nuclear Energy Outlook 2008: Executive Summary*, p. 13 [online available: http://www.nea.fr/neo/summaries/english.pdf] [last accessed 15 Jaunary 2009]

[15] Scajola, C. (2008) Nuclear phase out a '€50 billion mistake', In *World Nuclear News*, [online available: http://www.world-nuclear-news.org/NP_Nuclear_phase_out_a_50_billion_mistake_2010081.html] [last accessed 15 January 2009]

[16] Falksohn, R. (2007) A Nuclear Power Renaissance 2007, In *Spiegel Online International*, [online available: http://www.spiegel.de/international/spiegel/0,1518,460011,00.html] [last accessed 15 January 2009]

A Problematic Nuclear Renaissance?

It would appear then that nuclear power is experiencing renewed popularity, and the industry a consequent boom. Given increasing demand, the uranium price has seen a seven-fold growth since 2002 to reach $72 per pound (454 grams) in 2007.[17] But at the same time, the expanding market and growing political support for nuclear power have been accompanied by concerns about the associated risks to international security. The lack of final storage place for highly radioactive waste; the possibility of turning a nuclear power program into a nuclear weapons program; the threat of nuclear terrorism and the actual operation of nuclear power plants are some of the most commonly cited examples of dangers associated with nuclear energy.

The recent breakdown at Sweden's Forsmark reactor was a clear reminder that the safety of nuclear power technology is still an issue of serious concern. The incident prompted policy makers to call into question the operating capability of power plant control systems, and to advise the operators to take advanced security measures to improve reliability. The fact is that the majority of nuclear reactors, particularly in Eastern Europe and the former Soviet Union, have been operational for more than half of their original life cycle.[18]

In light of accelerating plant construction, the incident highlighted the need for adequate support in all technological and regulatory matters, especially in countries with no previous nuclear experience. The international nuclear community is trying to address the problem of reactor safety by enhancing harmonisation of individual national safety practices through a number of international initiatives, such as the Multinational Design Evaluation Programme (MDEP). The MDEP was created by ten experienced nuclear countries to exchange information among national regulatory authorities in light of new reactor designs. The goal is to harmonize regulatory practices and regulations to improve the safety of new power plants.[19] The challenge for the MDEP founders and the wider international nuclear community will be to ensure widespread implementation of common regulations, particularly among new nuclear countries.

Ensuring safety of nuclear power plants and other nuclear related infrastructure from acts of terrorism poses another serious challenge. It is also one which is increasingly considered to be beyond the responsibility of the nuclear industry.

Subsequent to the September 11 attacks, countries with nuclear reactor facilities increasingly began to consider their vulnerability to aerial attack – including a particularly notable report by the US Nuclear Regulatory Commission (NRC). Even though the studies dismissed "the likelihood of both damaging the reactor core and releasing radioactivity that could affect public health and safety *as* low", attacks on radioactive spent fuel stored in pools of water or in dry casks were identified as concerns.[20] Storage facilities were subsequently subjected to stricter NRC security requirements.

Concerns about terrorist attacks were boosted after the US Government Accountability Office (GAO) pointed out that the nuclear industry has been using the same security company (which is also responsible for securing about half of the US nuclear reactors) to conduct special force-on-force exercises crucial to the identification of potential existing safety gaps. In addition, the US Department of Energy had previously accused the company in question of covering up safety flaws.[21] Such revelations cast a damning light on both the ability of power plants to withstand an attack and also the risks posed by leaving such security issues to the private sector. Over the last decade a number of legislative proposals have suggested the replacement of private guards by a national force, and the establishment of a special task force to conduct regular power plant security reviews.[22]

In Russia, on the other hand, inspections revealed direly lacking control over some 85 radio-thermal generators in the Far North and East provinces, and their vulnerability to terrorist attack.[23]

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[17] Ibid.

[18] Umbach, F. (2003) Nuclear Energy Issues: Global Dimensions and Security Challenges, In *Recherches & Documents n° 30: Nuclear Issues in the Post-September 11 Era*, p. 26 [online available: http://www.dgap.org/midcom-serveattachmentguid-8c044016caef11daa8b14fe228e689d389d3/Nuclear_Energy_Worldwide_umbach.pdf] [last accessed 16 January 2009]

[19] Kaufer, B. (2008) *Multinational Design Evaluation Programme (MDEP)* [online available: www.iter.org/conferences/feb08/presentations/panel1/kaufer.ppt] [last accessed 16 January 2009]

[20] Behrens, C., Holt, M. (2005) CRS Report, Nuclear Power Plants: Vulnerability to Terrorist Attacks, p.4-5 [online available: http://www.globalsecurity.org/military/library/report/crs/rs21131.pdf] [last accessed 16 January 2009]

[21] Ibid., p.2-3

[22] Ibid., p.6

[23] Umbach, F. (2003) Nuclear Energy Issues: Global Dimensions and Security Challenges, In *Recherches & Documents n° 30: Nuclear Issues in the*

Another nuclear security concern is the proliferation of nuclear technology to questionable regimes such as North Korea or Iran. Whereas North Korea has openly declared its possession of nuclear weapons, Iran has been accused of disguising nuclear weapons aspirations as civil energy plans.[24] The former US Assistant Secretary of Defense Graham Allison depicted a threatening future scenario, stating that "if Iran crosses its nuclear finish line, a Middle Eastern cascade of new nuclear weapons states could trigger the first multi-party nuclear arms race, far more volatile than the Cold War competition between the United States and the Soviet Union."[25]

Since nuclear power plants built for peaceful purposes can also be misused to develop material for nuclear weapons, it is imperative that the spread of nuclear reactors and fuel be managed properly by the international community. This includes close consideration of all safety, security and non-proliferation requirements – particularly in politically unstable regions.

The challenge is two fold: to reduce existing stockpiles of nuclear weapons and to avoid further production.

As a result of the Cold War, 95 percent of the approximately 30,000 existing nuclear weapons are held by Russia and the United States. The rest are distributed among the United Kingdom, France, China, Israel, India, Pakistan, and possibly North Korea.[26] In the last two decades, United States and Russia have signed several disarmament treaties seeking to reduce nuclear weaponry by about 80%. In 1993, they implemented the Megaton to Megawatts program, aimed at converting of high-enriched uranium from Russian warheads and military stockpiles into low-enriched uranium for use in US civil nuclear power plants.

The total amount of highly-enriched uranium stored in US and Russian weapons and military reserves is estimated at some 2000 tonnes, equal to about twelve times annual uranium mining production.[27] Tapping the energy potential of existing warheads could thus not only help reduce stockpiles of nuclear weapons, but also prolong the utility of uranium reserves, currently projected to be sufficient for approximately 85 years.[28]

Concerning nuclear warhead production, the US National Academy of Sciences' Committee on International Security and Arms Control estimated that the amount of existing global nuclear explosive material in military and civil nuclear facilities could expand the current stockpile of nuclear weapons by an additional 100,000 units.[29] Given that much fissile material is considered to be insecurely stored,[30] the danger of nuclear explosive material falling into the possession of criminal networks, terrorist groups, or nuclear aspiring states poses a significant threat.

The outstanding legal and political instrument to restrain the diversion of civil nuclear material and technologies to weapons programs is the International Atomic Energy Agency (IAEA) safeguards system under the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). The system is sustained by

Post-September 11 Era, p. 12 [online available: http://www.dgap.org/midcom-serveattachmentguid-8c044016caef11daa8b14fe228e689d389d3/Nuclear_Energy_Worldwide_umbach.pdf] [last accessed 16 January 2009]

[24] Howard, N. (2007) *Nuclear Energy without Weapons*, Defense Concept Series, Center for Advanced Defense Studies, [online available: http://www.c4ads.org/files/cads_oped_nuclear_apr07.pdf?PHPSESSID=1545febd6f1be27a7b01531937d0] [last accessed 16 January 2009]

[25] Allison, G. (2006). The Will to Prevent. Global Challenges of Nuclear Proliferation, In *Harvard International Review,* Summer, Vol. 28, No. 2 quoted In Michel-Kerjan, E.O., Decker, D.K. (2008) *The Economics of Nuclear Energy Markets and the Future of International Security*, p. 29 [online available: http://opim.wharton.upenn.edu/risk/library/WP2008-01-08,EMK,DD_ENEM.pdf] [last accessed 16 January 2009]

[26] Fetter, S., Holdren, J.P. (2005) *Monitoring Nuclear Weapons and Nuclear-Explosive Materials: An Assessment of Methods and Capabilities*, Washington, D.C.: The National Academies Press, p. 2 [online available: http://books.nap.edu/openbook.php?record_id=11265&page=2] [last accessed 16 Januaryg 2009]

[27] World Nuclear Association, (2008) *Military Warheads as a Source of Nuclear Fuel* [online available: http://www.world-nuclear.org/info/inf13.html] [last accessed 16 January 2009]

[28] IAEA.org, (2006) *Global Uranium Resources to Meet Projected Demand: Latest Edition of "Red Book" Predicts Consistent Supply Up to 2025* [online available: http://www.iaea.org/NewsCenter/News/2006/uranium_resources.html] [last accessed 16 January 2009]

[29] Fetter, S., Holdren, J.P. (2005) *Monitoring Nuclear Weapons and Nuclear-Explosive Materials: An Assessment of Methods and Capabilities*, Washington, D.C.: The National Academies Press, p. 2 [online available: http://books.nap.edu/openbook.php?record_id=11265&page=2] [last accessed 16 January 2009]

[30] Umbach, F. (2003) Nuclear Energy Issues: Global Dimensions and Security Challenges, In *Recherches & Documents n° 30: Nuclear Issues in the Post-September 11 Era*, p. 5 [online available: http://www.dgap.org/midcom-serveattachmentguid-8c044016caef11daa8b14fe228e689d389d3/Nuclear_Energy_Worldwide_umbach.pdf] [last accessed 16 January 2009]

diplomatic, political and economic measures which aim partly to control the export of critical technologies.[31] The IAEA Expert Group Report (INFCIRC/640) identified four sensitive technologies with a high-proliferation risk: uranium enrichment, spent fuel reprocessing, spent fuel repositories and spent fuel storage.[32] The potential danger for inadequate control over these technologies prompted the IAEA to promote multilateral nuclear approaches directed at enhancing non-proliferation assurances for nuclear fuel cycle facilities.

Altogether, five approaches have been proposed: "supporting existing commercial market arrangements, creating and putting into effect international nuclear fuel supply guarantees with IAEA participation as a guarantor, encouraging voluntary conversion of existing national facilities to multinational, promoting the establishment of new multinational, and regional facilities based on joint ownership, and creating nuclear fuel cycle with stronger multilateral arrangements."[33]

In 2006, the Russian Federation and the United States presented separately two promising multilateral nuclear approaches, an International Uranium Enrichment Centre (IUEC) and a Global Nuclear Energy Partnership (GNEP), respectively. The IUEC suggests an international nuclear fuel centres system embedded within a "Global Nuclear Power Infrastructure" that would make nuclear fuel cycle services available on a non-discriminatory basis, and under the regulation of the IAEA. The GNEP, on the other hand, aims at developing advanced fuel cycle technologies and a fuel services programme, with the objective of providing developing countries with reliable access to nuclear fuel in exchange for abandoning aspirations of their own facilities.[34]

At the Sochi Meeting in 2008, Washington and Moscow finally issued a common Strategic Framework Declaration, expressing their mutual support for the establishment of both initiatives.[35] These joined other proposals such as those from Japan (IAEA Standby Arrangements System for the Assurance of Nuclear Fuel Supply), the UK (Enrichment bond), and Germany (International Enrichment Centre).[36]

At the G8 Summit in 2008 members also recognized the great significance of assuring nuclear safeguards, safety and security *(3S)*[37] in the civilian use of nuclear energy, and expressed a strong interest in their further development. They argued that ensuring 3S provides a solid ground for enhancing international transparency and trust in the employment of nuclear energy;[38] reiterated the need for a coordinated international cooperation; and encouraged active engagement of other relevant international institutions. In the Report of the Nuclear Safety and Security Group**,** the G8 members explicitly declared their support for the Convention on Nuclear Safety as well as the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. They noted the coming into force of the International Convention for the Suppression of Acts of Nuclear Terrorism, expressed support for the IAEA Code of Conduct on the Safety and Security of Radioactive Sources as well as the IAEA Guidance on the Import and Export of Radioactive Sources. Finally, the G8 members appealed to all other countries to participate in said instruments and guidance in order to increase multinational collaboration.[39]

Although the large number of legally and non-legally binding nuclear regulatory treaties, conventions, agreements, codes, guidelines and standards appear to be very promising at first sight, alarming shortfalls persist. The legal framework is fragmented and lacks consistent coordination and supervision by an overarching collective global body.

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[31] NEA, (2008) *Nuclear Energy Outlook 2008: Executive Summary*, p. 19 [online available: http://www.nea.fr/neo/summaries/english.pdf] [last accessed 15 Jaunary 2009]

[32] Rauf, T. (2007) *Multilateral Approaches to the Nuclear Fuel Cycle and other proposals* [online available: www-pub.iaea.org/MTCD/Meetings/PDFplus/2007/Seminar_For_Diplomats/Rauf_Presentation_NEW.ppt] [last accessed 19 January 2009]

[33] Ibid.

[34] Ibid.

[35] *U.S.-Russia Strategic Framework Declaration*, (2008) Press Release, Office of the Press Secretary, the White House, April 6, [online available: http://www.whitehouse.gov/news/releases/2008/04/20080406-4.html] [last accessed 19 January]

[36] Rauf, T. (2007) *Multilateral Approaches to the Nuclear Fuel Cycle and other proposals* [online available: www-pub.iaea.org/MTCD/Meetings/PDFplus/2007/Seminar_For_Diplomats/Rauf_Presentation_NEW.ppt] [last accessed 19 January 2009]

[37] "3S" as identified in the IAEA "Milestones in the Development of a National Infrastructure for Nuclear Power"

[38] G8 Summit, Hokkaido Toyako, (2008*) International Initiative on 3S-based Nuclear Energy Infrastructure,* p.1 [online available: http://www.mofa.go.jp/policy/economy/summit/2008/doc/pdf/0708_04_en.pdf] [last accessed 19 January 2009]

[39] G8 Summit, Hokkaido Toyako, (2008*)* Report of the Nuclear Safety and Security Group, p.1 [online available: http://www.g8.utoronto.ca/summit/2008hokkaido/2008-nuclear-safety.pdf] [last accessed 19 January 2009]

Accordingly, concerns that such efforts might not bring the expected result are mounting. The forthcoming challenge for the international community, therefore, will be to find common ground on which to agree the establishment of a world nuclear energy organization to oversee and coordinate a comprehensive legal, regulatory, and technical framework for the more transparent and sustainable use of nuclear energy.

The organization could be tasked with the licensing and oversight of new and existing power plants; determining the strategies for eventual phase-out; supervising the non-proliferation efforts regarding the four sensitive technologies; and facilitating the sharing of information and knowledge exchange on effective and non-risky technologies.

Also Mohammed El Baradei, Director of the IAEA, has criticised the existing legal energy framework for the fragmented piecemeal nature in which energy concerns are addressed. He argued that energy in all its forms requires, like health or food, a holistic approach based in the establishment of a global energy organisation. He pointed out that even though there are numerous international institutions concerned with energy, none of them can claim to be in possession of a comprehensive universal mandate[40] that would enable it to manage and oversee the gamut of international measures and instruments. The UN co-coordinating mechanism, UN-Energy (which since coming into force in 2002 has not even reached the status of a programme), does not seem capable of filling this gap. According to El Baradei, the ineffectiveness of UN-Energy derives from its fragmented nature, limited budget, and lack of implementation authority.[41] To assure the success of any future world energy organization, such weaknesses must be designed out from the start.

NATO's Added Value

In light of the risks associated with the deepening energy crisis, energy security has become an issue of global responsibility and concern – reinforcing the value of a world energy organization. However, as El Baradei pointed out, the establishment of such a body would not necessarily aim to replace other energy-concerned institutions. On the contrary, these shall remain and will support the work of the global organization as necessary. NATO should be no exception. However, if NATO is to add value, its debate on energy security must become more flexible and adaptive to the new challenges of the rapidly changing energy security environment. It would appear that the Alliance is more concerned with an ongoing internal dispute as to whether the institution should be active at all, while meekly limiting its vague public intentions to oil and gas infrastructure protection.

Although NATO Secretary General Jaap de Hoop Scheffer admitted in a 2008 speech to the Security and Defence Agenda that the "renaissance of civilian nuclear energy poses its very own proliferation problems[42]", the debate about NATO's role in energy security has so far remained limited to CEIP and has successfully avoided growing civilian nuclear risks.

NATO already has the capacity to add value in this area. The majority of NATO members are experienced nuclear countries with long traditions in designing, operating, securing and decommissioning nuclear power plants. They possess significant knowledge and practice in dealing with spent nuclear fuel, one of the greatest challenges posed by accelerated worldwide plant construction. France is particularly experienced in the field of nuclear fuel reprocessing, providing its services to other countries on a commercial basis.[43]

Newer NATO members possess experience with Soviet nuclear power technologies, providing the Alliance with complex technological and security understanding of most power plant types.

Given the diverse nature of its partnerships and its ties with nuclear and non-nuclear countries, NATO can further add value by providing an effective platform for information sharing and exchange of knowledge. In fairness, NATO has already initiated several workshops examining sensitive nuclear technologies and solutions. In 1996, a workshop was held on "Advanced Nuclear Systems Consuming Excess Plutonium" with the objective to explore new

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[40] ElBaradei, M. (2008) *Addressing the global energy crisis*, p. 1 [online available: http://www.iaea.or.at/NewsCenter/Transcripts/2008/cfm061008.pdf] [last accessed 19 January 2009]

[41] Ibid.

[42] de Hoop Scheffer, J. (2008) Speech at the SDA, *NATO: The Next Decade* [online available: http://www.nato.int/docu/speech/2008/s080603a.html] [last accessed 23 January 2009]

[43] NEA, (2008) *Nuclear Energy Outlook 2008: Executive Summary*, p. 24 [online available: http://www.nea.fr/neo/summaries/english.pdf] [last accessed 23 Jaunary 2009]

possibilities for plutonium disposal.[44] In 1997, NATO organised an advanced research workshop on "Nuclear Materials Safety Management," to examine nuclear materials handling, safety, disposition and storage.[45] The high attendance to these events demonstrates that NATO is widely accepted as a vehicle for dialogue in this area.

Monitoring and assessing the safety of nuclear power plants and other nuclear infrastructure are other areas for the Alliance to potentially add value. On a voluntary basis NATO could offer interested countries to assess safety and security measures at their facilities, as well as provide special training for plant security personnel. Moreover, in light of several multilateral fuel supply assurance proposals, NATO could assist in ensuring the security of these nuclear fuel centres as well as the security of nuclear fuel transportation.

These are only some of the many ways in which NATO could help improve nuclear energy security, and there is still room to deepen the discussion. The Alliance must acknowledge the security challenges of the emerging nuclear renaissance, and recognize its potential to add significant value. Internal disputes must be put aside to assure NATO's ability to react flexibly and anticipate new energy security challenges.

It is essential to note that the nuclear renaissance cannot provide an ultimate solution for energy security - which is why the international community (including NATO) should make use of the intervening time to foster other viable alternatives.

Conclusion

Energy security is a vivid concept which is much wider than security of supply and demand of fossil fuels. It is also a concept that, when not properly addressed, can pose a significant threat to international peace and stability. Thus, it is essential to treat energy security as a common concern and welcome any debate seeking measures to improve it. NATO's energy approach should be no exception. Rather than feared, NATO's steps toward adding value to energy security should be endorsed and sensibly directed. NATO's energy security discussion is relatively young and not yet fully developed. Perhaps as a result, it lacks receptivity to the broad variety risks arising from the rapidly changing energy security environment. While this paper aimed to point out one particular aspect for improvement, namely the need to foster debate on NATO's contribution to addressing the security challenges posed by the nuclear renaissance, the Alliance should strive to include the entire range of security issues which arise from the changing energy reality.

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[44] NATO, (1996) Workshop, *Scientists Explore Advanced Nuclear Systems Consuming Excess Plutonium* [online available:http://www.nato.int/docu/pr/1996/p96-144e.htm] [last accessed 23 January 2009]

[45] NATO, (1997) *NATO Advanced Research Workshop on nuclear materials safety management* [online available: http://www.nato.int/docu/pr/1997/p97-026e.htm] [last accessed 23 January 2009]

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