Canadian NATO Parliamentary Association

Association parlementaire canadienne de l'OTAN

Report of the Canadian Parliamentary Delegation respecting its participation at the Visit of the Science and Technology Committee

Canadian NATO Parliamentary Association (NATO PA)

Berlin and Munich, Germany
May 9-12, 2011

Report

From 9 to 12 May 2011, a delegation of the Science and Technology Committee (STC) of the NATO Parliamentary Assembly (PA) visited Germany on the invitation of the Head of the German Delegation and President of the NATO PA, Dr. Karl A. Lamers. The delegation consisted of parliamentarians from European and North American NATO countries as well as a Member of the Swedish Delegation to the NATO PA. Canada was represented by Senator Pierre Claude Nolin.

The delegation met with German government and military officials, leading think-tank experts and private companies in the Berlin and Munich areas, and discussed biological and chemical threats to Euro-Atlantic and global security, the military-technological aspect of the NATO mission in Afghanistan, and in particular Improvised Explosive Devices, unmanned military systems, and food and water security – all issues covered by committee reports in 2011.

The delegation also heard an official representative of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety on the re-examination of Germany's energy policy as a result of the nuclear incidents at the Fukushima Dai-Ichi nuclear plant in the wake of the double catastrophe - earthquake and tsunami - on 11 March 2011 in Japan.

The delegation furthermore received briefings on the challenges of and possible solutions to climate change; energy security in Europe; terrorism with Weapons of Mass Destruction (WMD); and cutting-edge science and technology that could impact the security environment of the future, for example revolutionary artificial oxygen carriers for blood replacement. Members also visited an Unmanned Aerial Vehicle (UAV) factory and the German site responsible for the production of the Eurofighter and the refurbishment of NATO's Airborne Warning and Control Systems (AWACS) aircraft. The NATO PA delegation took the opportunity to visit the NATO School in Oberammergau, which provides education and training courses in support of NATO operations to civilians and military officials from NATO and partner nations as well as international organizations.

Opening Session at the German Bundestag

Opening the visit at the German Bundestag, the lower house of the federal legislature, Dr Lamers welcomed the STC to the Berlin and Munich areas which are not only close to Germany's political centres of gravity, but also excel in technological innovation. He lauded the STC's continued attention to key Alliance issues, such as energy security, climate change, non-proliferation of WMD, cyber security, missile defence and Afghanistan. Still, the new developments in 2011 also deserved the committee's attention: the popular revolts in the Middle East and North Africa, operations in Libya, the death of Osama bin Laden and the nuclear accidents in Japan.

Berthold Goerke, Head of the Renewable Energies Directorate at the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, talked to the delegation about the massive impact the incidents in Fukushima had had on the popular debate on

nuclear energy in Germany. The German government did not have to start afresh on energy policy; last year's Energy Concept 2050 was a strong basis on which to go forward as it remained, in large part, a sound proposition for long-term energy security. With the Energy Concept 2050, the operating times of Germany's nuclear reactors had been prolonged to ease the way into a future based on renewable energy. This decision was under revision and likely to be changed. Still, no matter what the final decision would be, by 2050 Germany aimed to have reduced green-house gas-emissions by 80 per cent, increased the share of renewable energy in the total mix from 80 to 95 per cent and lowered primary energy use by 50 per cent. He put forward six strategies to achieve these goals:

- Renewable energy had to become a volume market instead of a marginal one at a greater pace.
- Energy distribution and storage networks had to be improved.
- Energy efficiency had to be consistently increased.
- More flexible power plants had to be built.
- Energy research and development had to be refocused and better funded.
- An inclusive adaptation process had to take place to convince the public.

The delegates were particularly interested in the German citizens' acceptance of a future without nuclear energy (which would entail higher energy prices at least for the short- and medium-term), alternative energy sources that could take the place of nuclear energy, as well as the potential for concrete energy savings. Mr Goerke told the members that an accelerated exit would not be free of cost, but that prices could be kept within acceptable limits. Gas and modern coal power plants would play a key role in any strategy, and biomass and photovoltaic energy would also be important. Large-scale energy savings were possible across all sectors.

The STC delegation then received a briefing from Roland Grafe, Head of the Division for the Biological Weapons Convention (BWC) and the Chemical Weapons Convention (CWC) at the German Federal Foreign Office. Mr Grafe gave an overview of the international frameworks in place and German priorities regarding biological and chemical threats. He expressed Germany's satisfaction with the CWC and its implementing organ, the Organization for the Prohibition of Chemical Weapons (OPCW). He testified to the effectiveness of CWC, pointing out the inspections of around 230 chemical facilities in Germany. Still, he voiced concern that several states in the Middle East had not yet ratified or even signed the CWC. He was less optimistic about the Biological and Toxin Weapons Convention (BWC). It was a considerably weaker instrument because of the lack of a proper implementing organization and weak verification measures. Strong verification measures were increasingly difficult and, in fact, unlikely. Still, he hoped improved confidence and compliance measures would be agreed upon at the forthcoming BWC Review Conference in December. The private bio-industry also had to take more responsibility by broader acceptance of codes of conduct, for example. Asked about the status of bio-defence, he highlighted the vast gap between the United States and the rest of the world: whereas per year US $ 6-7

billion were spent in the United States - two-thirds of global spending on bio-defence - Germany for example spent roughly only € 30-35 million.

Colonel Hans-Jürgen Marschall, Head of the Department for Counter-Improvised Explosive Devices at the Operations Command of the Federal Defence Forces of Germany, gave the STC delegation an extensive overview of the IED threat in Afghanistan, described the latest trends in Regional Command-North where the German contingent is concentrated, and offered a German perspective on the way forward. He doubted the value of increasingly sophisticated technological methods of countering IEDs, as the development of new Counter-IED technologies could often not keep pace with the development of new IED tactics. Counter-IED efforts rely 60 per cent on proper training of the troops, 30 per cent on technology and 10 per cent on luck, he said. The "intuition" of the individual soldier, which only comes with first-rate training, was therefore crucial. Asked whether ISAF was on the right track, he believed they were - for example in the protection of the troops - but cautioned against putting too many hopes into technology. For example, UAVs had only a success rate of about 1 per cent in finding IEDs. Rather, communication and information-sharing needed to be improved. When queried on whether Counter-IED efforts provided good grounds for European Union-NATO co-operation, he believed that some recent European Union Counter-IED efforts seemed to replicate efforts already in place in several NATO states.

The Effects of Climate Change and Possible Solutions

In order to further deepen its understanding of climate change, its effects and possible solutions, the committee visited the Institute for Advanced Sustainability Studies (IASS) in Potsdam. Introducing the work of the IASS, Dr. Mario Tobias, its Secretary General, underlined that the institute's mission was to forge an active link between top-class researchers at the IASS and politicians, non-governmental organizations and, not least, the broader public. The IASS focused on five core areas: climate stability, energy security, resource efficiency, issues of ecological and socially-compatible economic growth as well as the co-evolution of rural and urban areas.

Prof. Dr. Carlo Rubbia, the Scientific Director of the Earth, Energy and Environment Cluster and 1984 Nobel Prize winner in Physics, presented the work of his research unit, which he saw as a nursery of ideas for lasting development. He argued that the future of mankind depended on how quickly the world deals with the environmental challenge. Although an enormous challenge, he argued that science had saved humanity before – and could do so again. He focused on two innovative ideas that seemed particularly valuable to him. First, clathrate hydrates could become a major energy source. Trapping vast amounts of methane gas inside them, these water-based solids, also called "burning ice", existed in abundance in many parts of the world but a cheap extraction method had yet to be found. Second, a new "cryocooling" method to minimize energy loss could revolutionize electric energy transport over long distances.

Dr. Klaus Lorenz, a Research Fellow at the IASS, gave a presentation on sustainable soil use. He underlined the important ecosystem services provided by soil. A crucial problem was that soil developed very slowly, but could be destroyed very rapidly by human misuse. This had important consequences. For example, the first 30 cm of soil contained as much CO_2 as the world's atmosphere. While unsustainable soil use was

widespread in the developing world, even in Europe soil was often not used in a way that preserved its quality. The current system of EU subsidies, for example, created incentives to over-use soil and thus produced unnecessary soil erosion. Increasing urbanization and urban sprawl were also threatening soil in Europe. He suggested a range of possible remedies, such as providing continuous ground cover by mulching or using soil amendments such as biochar to improve soil quality.

Dr. Mark G. Lawrence of the Max Planck Institute for Chemistry and a Research Fellow at the IASS put the spotlight on an emerging field of research: climate engineering. While much of the world was searching for solutions to stem human-induced climate change, a small, but growing, community of scientists was grappling with the prospects of a world where the amount of CO2 in the atmosphere would not be reduced sufficiently. These scientists were therefore exploring ways to mitigate the effects of increased CO2 in the atmosphere. Two basic ideas had captured their imagination in particular: to capture CO2 from the atmosphere or to reduce the amount of sunlight hitting the Earth. One idea was to cultivate CO2-capturing plankton in parts of the world's oceans where it was usually rare by way of a process called "iron fertilization". While potentially cheap, this method harboured many risks however because tampering with marine ecosystems could produce unwanted side-effects. Some scientists had instead focused on emitting aerosols into the atmosphere to increase the amount of sunlight reflected back into space, thus cooling the Earth. Similarly, the idea of putting a giant mirror or numerous reflectors between the sun and the Earth had gained some currency, but could be prohibitively costly. Climate-engineering research should be further explored as a hedge against potentially catastrophic scenarios. Furthermore, he called attention to the need for more international regulation, of which there was little at this point, since states could use local climate engineering as a weapon for example.

Innovation in Science and Technology in Germany: The Adlershof Technology Park

A last stop in Berlin was the Adlershof Technology Park, which brought together more than 850 companies, research and development institutions and university institutions. Welcomed by Dr. Peter Strunk, the Head of Communications of WISTA, the park's managing company, the delegates heard how Adlershof had emerged from the East German Academy of Sciences after reunification and was Germany's largest science and technology park at this point. The park's main strength lay in the field of sustainable development, photonics, optics, micro-systems and micro-materials as well as photovoltaic, and it thrived on the synergies created by the concentration of high-end companies.

Prof. Dr. Ulrich Panne of the Federal Agency for Materials Research and Testing (BAM), the German lead agency on analytical measurements, told STC members that his organization had benefited tremendously from the technology park; tomorrow's analytical problem solving could only be taught and learnt using an integrative and interdisciplinary approach. Analytical sciences were important both in everyday life as well as in high politics. The BAM was, for example, responsible for the safety of chemicals and technology. Also, the science of climate change would be impossible without correct measures as well. In the past, the agency had also been called upon to adjudicate in disputes between European countries over how to measure natural gas

transfers. Laser-induced plasma spectroscopy used for stand-off detection and space missions, and the detection of such explosives as TATP used in IEDs were other key research areas for analytical sciences.

Dr. Hans Bäumler of the CC-Ery GmbH, a new Berlin-based company, presented his company's technology for artificial oxygen carriers for blood replacement. There was an increasing need for red blood cells for use in important surgical operations, accidents or the treatment of war victims, for example. CC-Ery had therefore developed a technology platform for fabrication of haemoglobin micro-particles for blood replacement. Where the attempts of others to produce such carriers had run into difficulties, CC-Ery believed that its technology could succeed. Their haemoglobin micro-particles could be fabricated in large amounts and at low cost and were physically and chemically stable over a long period. In fact, the technology could also be used for gas exchange in submarines or scuba-diving equipment. The delegates' questions focused on how to bring these micro-particles into mass production.

Finally, Dirk Oberschmidt of the Fraunhofer Institute for Production Systems and Design Technology presented an overview of high precision manufacturing technologies at the Fraunhofer Institute. With over 70 test areas and a budget of € 28.3 million, this part of the Fraunhofer Institute focused on micro-production engineering, i.e. the production of goods with at least one functional geometry feature that has dimensions or an accuracy of less than 10 µm. The Fraunhofer Institute thus worked on smaller and more accurate tools or machine parts in many industries, including the defence sector, but also on basic-level research. Two of their concrete projects were the production of the new German ID cards and the prospective reconstruction of government documents destroyed during the recent upheaval in Egypt.

Visit to the NATO School in Oberammergau

STC members took the opportunity to pay the NATO School in Oberammergau its second visit by a NATO PA delegation, where they were warmly welcomed by its Commandant, Colonel Mark D. Baines. An institution crucial to the Alliance, the NATO School conducts education and individual training in support of current and developing NATO operations, strategy, policy, doctrine and procedure. In 2009, the delegation included US Congressman and then-NATO PA President John S. Tanner, who subsequently took the lead in passing the 2010 Resolution 527 of the US House of Representatives that commended the school for its achievements.

The Deputy Chief of Staff, Lieutenant Colonel John Leigh, took the delegates on a tour de force of the history of the barracks from its early beginnings as a signalling school in 1937 to its post-World War II transformation into the NATO School and its recognition as a NATO military body in 2004. He underlined that the school was always at the forefront of Allied training and education. In particular, it excelled in recognizing emergent needs and providing the necessary courses, even before the NATO command structure asked for them. Priorities at this point were, for example, cyber security, incorporating the new strategic concept and counter-insurgency operations in Afghanistan.

STC delegates also heard and saw first-hand how popular the NATO School is with partner nations. In 2010, students had come from 67 states. A particular focus was the

education and training of Afghan and Iraqi students. Indeed, over 1000 Iraqi students had already attended courses. The NATO School continuously updated itself on the situation in Afghanistan and best practices in counter-insurgency, sending their own teams to the country and receiving Afghan teams in Oberammergau. However, current Afghan priorities lay on teaching basic military skills. Additionally, current high-intensity operations meant that little room existed for more in-depth training and education courses at this point. Nevertheless, they believed that a maturing process would take place in due time, as was the case with Iraq.

The STC delegation received a briefing on a concrete example of how the NATO School supports current operations in Afghanistan. Lieutenant Colonel Richard Ellis, the Department Director of the Expeditionary Intelligence Training Program, presented the school's approach to teaching courses on Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR), which were naturally targeted at counter-insurgency operations in Afghanistan. In 2010, the NATO School had taught 22 different courses on this subject, with 59 iterations, and had sent three Mobile Education Training Teams to the country. To be close to operational needs, the programme relied heavily on lecturers with recent in-theatre experiences and Afghan officials.

EMT: A Tactical UAV Factory

The STC delegation was received at one of Europe's leading manufacturers of tactical UAVs, the EMT Ingenieurgesellschaft in Iffeldorf (located halfway between Oberammergau and Munich). Sascha Lange, the Business Development Manager of the middle-sized company, pointed out that, with over 500 UAVs produced and 20,000 missions flown, EMT was the most experienced company in Europe in terms of numbers produced and flight hours. First used by the German Armed Forces in Kosovo and Macedonia in 2000, its UAVs were also in use in the Netherlands, Norway, Pakistan, Saudi Arabia and South Africa at this point.

EMT produces a wide range of UAVs, from hand- to catapult-launched but are strictly unarmed. The flagship system LUNA is a runway independent system with a weight of 40 kg, a range of over 100km and a maximum flight time of 6-8 hours. It was also possible to add a small helicopter, the MUSECO, to the LUNA system, which would increase operational utility. Questions revolved around UAVs specifications, possible civilian applications as well as performance in Afghanistan, where no drone had been lost to enemy fire.

The Center for Applied Policy Research

In Munich proper, the committee delegation met with one of the premier international relations think tanks in the German academic landscape: the Center for Applied Policy Research (CAP). Its Director, Prof. Dr. Dr. h. c. Werner Weidenfeld, welcomed the members and presented the overall agenda of the CAP, which aimed to have a direct impact on policy-making through strategic problem-solving.

Michael Bauer, a Senior Researcher at the CAP, presented his research on the prospects of terrorists acquiring and employing WMD in their strategy. He saw the September 11 attacks as a "game-changer" that made policy-makers focus on worst-case scenarios regarding WMD terrorism. While this perspective was still widespread in

the United States, the European view had evolved into a more risk-based assessment. He said that WMD terrorism remained more of a metaphor than a concrete scenario of future terrorist activities. The discussion which followed centered on such questions as future terrorist trends, the root causes of terrorist recruitment, state-sponsored terrorism, as well as national counter-terrorism efforts and readiness.

Florian Baumann, a Research Fellow at the CAP, reported to the committee delegation on his research into energy security, especially in a European context. Of course, the dependency on Russian natural gas loomed large in any such discussion. Resource nationalism was another sore point in making Europe more secure in its energy supplies. He made clear that Europe had to find the right balance between energy security, energy sustainability and economic competitiveness, which could not be done without sometimes difficult tradeoffs. Energy security consisted of four dimensions: internal policies, economic dimensions, geopolitics and security considerations. At the European Union level, he noticed a strategic deficit, as "energy solidarity" was oft-invoked but insufficiently operationalized. This lack of solidarity among European friends and allies was also the centre of attention in the discussions. Nevertheless, he was reasonably optimistic that a step-by-step evolution towards more solidarity would take place over time. Discussions also turned to the possible accelerated nuclear exit of Germany.

Cassidian: An EADS Subsidiary

The committee trip to Germany ended with a visit to Cassidian in Manching, north of Munich, a subsidiary company of the European Aeronautic Defence and Space Company (EADS). Peter Maute, Senior Vice President Sales Combat Air Systems, gave the delegation an overview of Cassidian and the facilities in Manching. The main activity in Manching was the final assembly of the German Eurofighters and the production of the German components in the Eurofighter programme, but the company also refurbished the Alliance's AWACS. In Manching, Cassidian employed roughly 4,000 personnel, which had overseen over 1,400 final assemblies of the Eurofighter since the start of the programme. In Austria, Germany, Italy, Spain, Saudi Arabia and the United Kingdom, the Eurofighter, which Mr. Maute called the best combat aircraft in the world, replaced 11 aircraft systems. The debate following the presentation included a discussion of the Eurofighter programme in relation to the US Joint Strike Fighter F-35 programme. Mr. Maute told the delegates that the Eurofighter excelled as a multi-role aircraft focused on air-to-air combat, whereas the F-35 was more geared towards an air-to-ground role.

Respectfully submitted,

The Honourable Senator Pierre Claude Nolin
Canadian NATO Parliamentary
Association (NATO PA)

Travel Costs

ASSOCIATION	Canadian NATO Parliamentary Association (NATO PA)
ACTIVITY	Visit of the Science and Technology Committee
DESTINATION	Berlin and Munich, Germany
DATES	May 9-12, 2011
DELEGATION	
SENATE	Senator Pierre Claude Nolin
HOUSE OF COMMONS	
STAFF	
TRANSPORTATION	**$5,257.35**
ACCOMMODATION	**$1,261.39**
HOSPITALITY	**$0.00**
PER DIEMS	**$467.20**
OFFICIAL GIFTS	**$0.00**
MISCELLANEOUS / REGISTRATION FEES	**$0.00**
TOTAL	**$6,985.94**