

There has unfortunately never been a more fortuitous time to focus attention on energy security and NATO involvement in confronting this strategic challenge albeit for all the wrong reasons. Stubbornly high oil prices are a proven burden to NATO Member State economies and their oil dependent militaries. Ongoing political instability in the Middle East, the world's most important and concentrated oil producing region, underscores oil's strategic importance as a transportation fuel and the vulnerabilities associated with it. And the enduring global economic recession, catalyzed at least in part by the historic oil price peak in July 2008, have forced NATO Allies to carefully consider the cost of Alliance defense and security in what has become an age of austerity.

Against this gloomy background, and in spite of the fact that the Alliance has been mandated to address a narrow list of energy concerns - ranging from critical infrastructure protection to information and intelligence fusion and sharing to assess how global developments, including energy, may impact on NATO nations - consensus on precisely what NATO's role should be on energy is lacking. Having said this, NATO has for example two relevant maritime operations vital to European energy supply security. Operation Active Endeavor launched in October 2001 protects shipping in the Mediterranean (through which 65% of Europe's oil and gas transit), and Operation Ocean Shield is designed to address piracy in the Gulf of Aden and Horn of Africa a region vital for global maritime trade in oil.

There are however a few actionable items NATO can immediately undertake in incremental fashion to begin to address these emerging threats and challenges to sustain Allied Forces in operations. Each one of these items exhibits the following characteristics: they are non-political, they encourage Allies to cooperate in developing, acquiring and maintaining military capabilities through reducing oil dependence in tactical weapons systems through the introduction of alternative fuel blends for these systems, they will contribute to reducing the financial burden of fuel in military operations and/or will lessen the strategic importance of oil, they will reduce the oil-cost volatility effects of oil on military budgets, and will encourage greater cooperation, the pooling of knowledge resources, and strengthen Allied consensus on how to achieve better military efficiency through the introduction of new technologies and power/fuel savings measures.

Focus on oil

On an Alliance basis, oil is a non-political issue. It is a fact. All NATO Member States are oil dependent in the transportation sector regardless of whether they are net producers or consumers of oil and oil derivatives. All NATO military land, sea and air based tactical weapons systems run on oil. The military oil burden is significant. For example, the US DoD spent approximately \$16 billion on fuel in 2011. This is equivalent to 26% of France's 2010 defense budget, 34% of Germany's 2010 defense budget and 42% of Italy's 2010 defense budget. This figure is 16 times the annual defense budgets of Latvia, Estonia and Lithuania combined.

In an age of austerity and while NATO military expeditionary forces such as ISAF are in a period of draw-down, military budgets and fuel expenditures in a non-combat era will be tightened and decidedly fixed lessening leeway in meeting large and unforeseen expenditures for fuel and power generation requirements. At the same time, an unforeseen \$1 increase in the cost of oil sustained over one year costs for example the Pentagon an additional \$130 million per year. According to the IMF the average price of oil in USD in 2011 was approximately \$104/b. In February 2012 the price of oil was pegged at approximately \$124/b. If sustained over one year, a year-on-year 20% increase in the cost of oil would add an additional \$2.6 billion USD to the

US DoD's fuel bill. A pertinent question to ask and then answer is how much does a \$1 increase in the cost of oil sustained over one year cost NATO Member States collectively? In short the greater understanding there is of the fuel cost-burden to NATO militaries the greater an appreciation for the financial benefits to be derived from fuels' savings either through enhanced military efficiency or through scaling up the large-scale, long term introduction of alternative fuel blends for use in NATO military tactical weapons systems and operations.

Second, even if alternative fuel blends offer no cost-advantage over oil (in short where there is price parity between oil exclusive fuels and alternative blended fuels) a consolidated and coordinated attempt on an Alliance-wide basis to better understand and then implement the introduction of alternative fuels in NATO militaries will work to diminish the strategic importance of oil as a transportation fuel.

Third, there is the very real risk that if the strategic importance of oil to NATO operations and weapons systems is poorly understood, and lacks consensus on an Alliance basis, that efforts to increase military efficiency to decrease military oil dependency, will render low if not negligible results. The reason for this is that the oil market is not a completely free market but one in which prices are affected by a cartel and supply is manipulated by it. Military organizations are not immune from this paradigm. The experience of energy efficiency measures to increase fuel economy in the private vehicle market is instructive here. As for example, US fuel efficiency standards have increased (and consumption declined as measured by MPG) gasoline prices continue to increase over time due to supply manipulation and incessant demand particularly from countries like India and China. Based on this hypothesis, anything less than introducing fuel competition and diversification for military fuel usage will have little impact on prices, will maintain the strategic importance of oil and related vulnerabilities, and fail to realize the intended objectives of reducing the strategic dependency on oil for military purposes.

Actionable Item

A study should be commissioned and conducted to ascertain the cost of oil to NATO militaries. Baseline assessments on present fuel use and cost could be easily derived and several scenarios could be plotted to determine the projected cost of fuel use in NATO military operations based on a variety of oil price/growth and combatant scenarios. An additional data collection and collation exercise should be carried out to present lessons learned regarding the human cost of fuel transport and delivery in current theaters of operations where Alliance troops have been or are present. It is estimated for example that approximately 10% of all casualties in Iraq between 2003-2007 were incurred during the protection of fuel convoys. In Afghanistan, it is estimated that there is one casualty for every 24 fuel convoys. It is further recommended that casualty impacts (and other operational impacts) related to using alternative energy and water technologies to sustain NATO missions should be evaluated in NATO combat and combat support models over a wide range of theaters and scenarios to better reflect the complex conditions and actions at the tactical and theater levels.

Providing a platform for information exchange

Addressing energy security issues within a NATO context on an ad hoc basis sends the wrong message to nations on the strategic importance and vulnerabilities associated with oil and energy *writ large* as a security issue. To de-politicize this exchange, the focus of information exchange should be on best practices and lesson learned from military energy efficiency measures, studies, fuels and technologies gleaned from individual NATO Member States' experience. The Energy Security Section of the NATO's Emerging Security Challenges Division

(ESCD) and Allied Command Transformation could assist in this exchange. The Lithuanian Energy Security Center could also be utilized as a clearing house for execution and dissemination of this information. The reality is that many nations are working in stove-pipe fashion on a variety of fuels and military efficiency efforts, strategies, and technologies. Coordination is severely lacking on an Alliance level. This information requires that it be thematically collated, discussed and disseminated to maximize its value and impact. As ACT is NATO's leading agent for change, driving, facilitating, and advocating continuous improvement of Alliance capabilities to maintain and enhance the military relevance and effectiveness of the Alliance, ACT could play an important role if not lead this effort in cooperation with ESCD at NATO HQ.

Actionable items

A clear and distinct platform for information exchange should be organized and established inter alia by ESCD, ACT, and the Lithuanian Energy Security Center to maximize the dissemination of information on military energy efficiency measures, studies, alternative fuels and deployed technologies. This will further require public-private sector input, cooperation and exchange as the private sector is the primary provider of scientific innovation, product development and production of new technologies and fuels geared towards reducing the military fuel and power burden.

Education and Training

The energy landscape is populated with an ever-growing number of strategic, technological, and scientific developments that can drive forward the introduction of new innovations and technologies to improve military energy efficiency and thinking regarding energy needs and requirements. Operational energy is the key phrase that captures this concept. However operational energy requirements need to be integrated into the early stages of hardware procurement in order to assess the life-cycle requirements of building a more energy sustainable military with new fuels and technologies. Such an evolution in thinking will only come with education and training across all NATO military combatant commands, logistical and support agencies, and those responsible for strategy and planning. Fortunately NATO has a number of institutions which, if equipped with appropriate knowledge resources, can lead to the realization of the long term objective of an operational energy strategy for NATO forces. Clarity on 'operational energy' can benefit as a departure point for discussion from the US Operational Energy Strategy. This strategy stresses:

- More fight, less fuel: Reduce the demand for energy in military operations.
- More options, less risk: Expand and secure the supply of energy to military operations.
- More capability, less cost: Build energy security into the future force.

The NATO School in Oberammergau, Germany is an appropriate setting for providing professional education and training to NATO personnel on operational energy issues and the German Marshall Center in neighboring Garmisch-Partenkirchen, Germany is a second institution that could support education and training to NATO Partner Country personnel.

Actionable items

NATO Member States should contribute to and support the establishment of an ongoing education and training course for NATO military personnel. Specific educational component blocks can be established in consultation with NATO combatant commanders to assess their training needs and these needs can be met by energy security professionals drawn from academia, think tanks, and from current and retired military personnel with experience in

managing and addressing operational needs and requirements as well as on the strategic dimensions of energy security.

Linking 'Smart Defense' and NATO energy security

Linking smart defense, the concept that encourages Allies to cooperate in developing, acquiring and maintaining military capabilities to meet current security problems in accordance with the new NATO strategic concept, to addressing NATO's energy security can be galvanized through 'Smart Energy.' Smart Energy is a concept that embraces forward-thinking solutions to vulnerabilities associated with Allied energy security. It addresses the operational energy needs of the warfighter. It addresses the key strategic vulnerabilities of oil as the primary feedstock for all military tactical weapons systems. And it addresses the key NATO requirement of being a more robust, deployable, and sustainable collective security organization moving towards NATO 2020 and beyond.

'Smart Energy' is the energy sector's program for Smart Defense. It is a holistic approach that incorporates into a single program all of the incremental steps required for actualizing NATO thinking and response to energy security as presented herein. Smart energy focuses on minimizing the strategic vulnerabilities associated with oil dependency in NATO militaries. It provides a platform for information sharing drawing on the best practices and lessons learned by individual NATO Member State military organizations. This information is presently locked-up, stove-pipe fashion even within a single nation's various combatant commands. A platform for information sharing would unleash these practices and lessons learned for the benefit of the Alliance in order to increase military efficiency and reduce human casualties associated with fuel use for transportation and power in NATO operations.

Smart energy also promotes a strong education and training component to sensitize military leadership to operational energy considerations in building a more forceful and sustainable military for the future. Smart energy is austere in its approach with the objective of minimizing or reducing the fuel-cost burden for military operations. In doing so it will erode the strategic importance of oil as a monopoly transportation fuel and increase Alliance capabilities for meeting 21st century emerging security threats and challenges.

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