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TO : See Distribution

SUBJECT : Report from the SFA Workshop, Budapest, Hungary

DATE : 17 November 2018

1. Supreme Allied Commander Transformation (SACT) is pleased to report the findings of the Strategic Foresight Analysis (SFA) workshop in Budapest, Hungary on 6-8 November 2018. Building on the discussions at the previous SFA workshop in Cadiz, Spain, the aim of this workshop was to set the foundation for the three regional perspectives workshops that are planned for 2019; focused on North Africa, Russia and Eastern Europe, and the Arctic/High North. This event was supported by over 130 participants from 26 NATO and Partner Nations (22 NATO, 4 Partners), NATO HQ, NATO Commands and Agencies, 14 Centres of Excellence (COEs), the European Defence Agency, industry, think tanks and academia.

2. The SFA Budapest Workshop provided an open and transparent environment that allowed extremely useful discussions on the regional perspectives. The breakout sessions started with a review of SFA 2017 trends and their associated implications specific to the regions. The breakout sessions continued with identification of key areas, concerns, and issues that required further analysis and could potentially be used as a topic for a call for papers in preparation for the respective regional perspectives workshops. Additionally, industry representatives provided briefings on how computing power could be used to support the research and analysis phases of SFA which validate and inform trend analysis and the identification of implications.

3. It has been increasingly clear that there are diverging national views and interests in the respective regions. The SFA Budapest workshop set the stage for the follow-on regional perspectives workshops which will help us to understand these differences and find areas in which we can develop a shared perspective of the future security environment. This report should be read as a reflection of the discussions held at the workshop and breakout sessions, and should not be perceived as the views of ACT or the Alliance.

4. I remain extremely grateful for the continued support and engagement that we benefit from across the Alliance in the development of the SFA, FFAO and Regional Perspectives Reports. These documents directly inform our understanding of and preparation for the challenges of the future, and it is through the broad participation in events such as these workshops, that true insight and innovation can be captured.

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5. HQ SACT will release a separate 'save the date' message and invitation letter for each regional perspectives workshop. However, for initial planning purposes, please note the dates and locations of the intended activities for 2019:

- a. North Africa Regional Perspectives Workshop: 2-4 April 2019, Madrid, Spain,
- b. Russia and Eastern Europe Regional Perspectives Workshop: 17-19 June 2019, Helsinki, Finland
- c. The Arctic/High North Regional Perspectives Workshop: 16-19 September 2019, Oslo Area (TBC), Norway

6. Should there be any questions, the ACT points of contacts are COL Tibor SZABO, (tibor.szabo@act.nato.int), Branch Head, SACT SPP Strategic Analysis Branch; Mr. Mehmet KINACI, (mehmet.kinaci@act.nato.int) for SFA matters and LTC Richard PLEIJSANT, (richard.pleijsant@act.nato.int) for FFAO matters.



William.Hickman
Major General, US Army
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ENCLOSURES:

1. Strategic Foresight Analysis (SFA) Workshop Report, 6-8 November 2018.

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Strategic Foresight Analysis (SFA) Workshop Report
6-8 November 2018
Budapest, Hungary

1. Background:

- 1.1** Headquarters, Supreme Allied Command Transformation (HQ SACT) is pleased to report the findings of the Strategic Foresight Analysis (SFA) workshop in Budapest, Hungary, at the National Public University on 6-8 November 2018. Building on the discussions at the previous SFA workshop in Cadiz, Spain, the aim of this workshop was to set the foundation for the three Regional Perspectives Workshops (RPWs) that are planned for 2019; respectively on North Africa, Russia and Eastern Europe, and the Arctic/High North. These workshops will contribute to the development of Regional Perspectives Reports for each region. The Budapest workshop also provided an opportunity to demonstrate potential use of data science applications to improve the efficiency and increase the capacity of ACT's foresight methodology.
- 1.2** The workshop started with welcoming remarks by the Hungarian Deputy State Secretary and an overview of Hungarian transformational efforts, followed by a briefing from Microsoft Solutions Group on their applications to conduct large data analytics., A short overview of the Long Term Military Transformation (LTMT) program followed to inform first-time attendees on ACT's Future Work and the purpose of the regional perspectives reports. The morning session concluded with a short lead-in briefing focused on the aim, objectives and desired outcomes of the first breakout sessions on North Africa.
- 1.3** Over the preceding two days, participants worked in breakout sessions along the five themes of the SFA (Political, Human/Social, Technology, Economics/Resources, and Environment) to analyse trends and implications, and to identify key areas, concerns, issues for the different regions. They were also asked to determine initial ideas that will require in-depth analysis. These ideas will be distributed to a wider audience for their inputs which will serve as the basis for call for papers in development of the Regional Reports. The participants were also requested to identify potential SMEs that could support the Regional Perspectives workshops and reports. Before the breakout sessions on Russia and Eastern Europe and the Arctic/High North regions, the Host Nation gave an overview of its Innovation Hub, followed by lead-in briefings on these respective regions.
- 1.4** On the final day, the breakout sessions were finalised and the workshop continued with a briefing on Space. Breakout session leaders/SMEs provided back briefs of their respective regional discussions. Finally, the workshop concluded with closing remarks provided by Col Tibor Szabo, Strategic Foresight Branch Head.
- 1.5** The Budapest workshop provided valuable input to the development of the respective Regional Perspectives Workshops. Moving forward with this project, the SFA/FFAO teams will continue to plan and organize the Regional Perspectives Workshops in close coordination with the respective host nations: Spain, Finland, and Norway. The results of the workshops will be reflected in, and establish, the foundation of the regional reports. These reports will inform the development of SFA 2021 report and provide input to the FFAO 2022 report.

2. SFA Workshop Budapest, Hungary - Participants:

Attendees	
ACT (including SEE & STRE)	23
ACO	4
NATO HQ	3
14 COEs	17
25 Nationalities	85
Total	132

Member Nations	BEL, BGR, CAN, CZE, DEU, DNK, ESP, FRA, GBR, GRC, HUN, ITA, LTU, NLD, NOR, POL, PRT, ROU, SLO, SVK, TUR, USA
Partner Nations	AUT, CHE, FIN, SWE
COEs	CCD, CIMIC, CJOS, CMDR, CWO, DAT, ENSEC, EOD, JAPCC, JCBRN, MILMED, MW, SP, STRATCOM
Academia/Industry	Microsoft, Austrian Institute of Technology, Old Dominion University, Kindred Spirits, The Netherlands Organisation for Applied Scientific Research, US Army Training and Doctrine Command, Swedish Defense Research Agency, Bundeswehr University, University of Loughborough, Leonardo Company, National University of Public Service, NUPS Doctoral School of Military Sciences, and University of Copenhagen

3. Foundational documents:

The SFA 2017 and FFAO 2018 Reports. SME presentations provided by Dr. Regina Karp, Dr. Adrian Kendry, CDR Geir Arne Hestvik and LTC Ryan Snider. Additionally, Hungarian authorities provided briefings on their approach to defence planning and innovation.

4. Workshop Findings:

4.1 Part – 1: North Africa:

4.1.1 Political:

• **Analysis of trends and implications:**

There is not one Africa but multiple “Africas” – all of them are interconnected. Understanding the future trends in the North-Africa area can be only accomplished through the comprehension of those which occur in the Sahel and the Sub Sahel region and by the study of the interactions of this “group of countries” with the Mediterranean and Gulf area nations.

A short historical review of the last ten years (Arab spring, end of the dictatorship, ISIS and the caliphate, mass migration, war, and civil war) show us the impossibility to elaborate a credible assessment beyond a range of 10 years.

North Africa can be depicted as an area of friction and competition between different political, religious, societal and economic models. The friction between these models has driven positive outcomes such as Tunisia’s “Democratic Hope” and negative outcomes such as the chaos in Libya. In a context of the redefinition of the international order, the future dynamic in this region will likely balance between integration and succession of extreme events through a series of shock, war and crisis. Divided by the temptation to escape from the “mess” through an “African solutions to African Problems” strategy and the absolutely necessity to “stay” to prevent disasters, the western nations will try, unified or not, to provide an answer to what seems to be a region of endless crisis with no attainable solutions. Nevertheless, progress and opportunities will occur but more in response to events rather than achieved through proactive efforts. The main trends and their implications:

- Political manipulation of Islam will continue: This phenomenon will increase with likely impacts on the West and in its efforts to interact with the countries of the region.
- Mass migration is the ultimate challenge: The point of inflection is reached. This issue is identified as a political game changer which can redesign the political map of Europe. Nevertheless, the problem and its roots seem to be impossible to fix in the near future.

- The redistribution of power: A new international order is developing. The confrontation between the “Unilateralism” approach and the “Multilateralism” one will drive future western strategies and their implementation in the area. New opportunities will occur especially for regional powers and peer competitors which will try to take the lead in the region.
- Actual borders could be challenged: Resulting from the outcomes of the redistribution of power in the 20th century, the actual borders of nations in North Africa will be challenged. Non-state actors supported by external entities will try to destabilize nation states in attempts to create new countries in ungoverned and challenged areas.
- **Key areas/concerns/issues:**
 - Radical political manipulation of Islam will likely drive to an amplification of the polarization of western societies. This phenomenon could impact the NATO and EU’s cohesion.
 - Africa is now a playground for great power and regional power competition. China will increase its influence to control resources and develop their economic business plan. Russia will increase its political influence of the Suez Canal and will attempt to get along with Egypt and to settle in the region thanks to its military power. Competition for the Sunni leadership will likely influence the way the next generation of North African leaders will govern and how they consider their relationship with the world.
 - Implementation of democracy will be challenging. The West will try to promote its liberal democratic model in competition with its ideological, political and economic peer, and regional competitors.
- **Initial ideas for call papers:**
 - How to build effective institutions in North Africa and the Sahel region?
 - Which political and societal models are the more relevant to stabilize North Africa and the Sahel strip?
 - Potential paths of the political manipulation of Islam for the future.
 - “African solutions to African problems” A relevant strategy for the future?
 - Understanding the new redistribution of power in North Africa and the Sahel.

4.1.2 Human:

- **Analysis of trends and implications:**

The population in Northern Africa will grow over the next decades, but at a slower rate than in other areas in Africa. Although still higher than replacement rate, fertility rates are relatively low for Africa and still dropping, with the exception of Egypt. Life expectancy is steadily growing, however due to fertility and an existing youth bulge, the average age will remain low. Urbanization is likely to continue, driven by several factors including insecurity and lacking basic needs. Social media will play an increasingly important role in how people communicate. Although the Arab Spring uprisings have ended, root causes for polarization have not been addressed sufficiently and large parts of the disenfranchised population are alienated from and have no loyalty to the government and perhaps society. Migration will remain an issue for the region, not only as transit nations, but also as sending and increasingly as receiving countries.

Implications: The developing social systems in the region will be challenged in dealing with increased health care demands and huge youth unemployment rates. Governments will be challenged to provide basic needs for their urbanized populations, and existing institutions will need to regain their credibility as they are increasingly facing decentralized and diverse social networks. This all may lead to increased instability and migration.

- **Key areas/concerns/issues:**

- Women and children are the most vulnerable groups in destabilized regions. Migration of men, trying to make a living and provide for their families, may leave women and children unprotected and increases the likelihood of them becoming victims of abuse, slavery, etc. Protecting these groups is essential to prevent further destabilization.
- Poverty and radicalization are often linked. Despite economic growth, a large part of the population will remain (extremely) poor. High unemployment rates, even amongst well educated young people, are a concern, not only as a possible source for migration but also radicalization.
- The geographical conditions of the region do not facilitate its governance, leading to vast uncontrolled spaces where state sovereignty is not recognized or challenged. The tribal population of this area does not consider themselves part of the society or citizens of a country. The control of this area and its population is essential in order to control migration, and stop human trafficking or terrorism.
- Uncontrolled urbanization and governments failing to provide basic needs are serious concerns for the health situation in the region with an increased risk of outbreaks of pandemic diseases.

- **Initial ideas for call for papers (2035 focused):**

- How are ungoverned spaces actually governed and what implications does this have for North Africa and/or NATO?
Large parts of the region are covered by the Sahara desert and effectively ungoverned by the state. The area is almost exclusively inhabited by nomadic people who don't consider themselves part of the society or citizens of a country, and without loyalty to whatever county they are in at any given time. However, a certain type of self-governance may exist.
- How can North African countries execute effective border control, both on land and sea?

4.1.3 Technology:

- **Analysis of trends and implications:**

In consideration of the role of technology in North Africa in the future, the syndicate developed a list of broad categories that would likely have significant influence on the trends and implications across the region. These categories were global influences, communications, business/commerce, environment, energy/resources, education, labour, healthcare, military, infrastructure, and governance/culture.

There are a number of global influences that will impact the North Africa region. Particularly among those, climate change will have global impact that will extend throughout the entire African region. Climate change will increase the importance of renewable energy, particularly solar, of which abundant amounts could come from North Africa. The migration of disease driven

by climate change and large number of refugees will impact the region increasing demand for healthcare and rapidly developed or universal vaccines.

Ubiquitous computing and predictive analytics will drive information everywhere and allow the monitoring of everything. Access to this abundant information will be very important. It will also allow government or companies to limit access based upon political or business priorities. Pervasive education will lead to greater gender equality within education as girls and women will be able to access education anywhere. Quantum computing will supplement ubiquitous computing and allow application across areas of modelling, simulation, and cryptography amongst others.

Business practices will evolve supported by technologies such as mobile payments (M-pesa), Blockchain, cryptocurrency, crowd sourcing/Uber of everything, and distributed autonomous organisations.

- **Key areas/concerns/issues:**

The anticipated abundance of solar resources will make the arrival of the cost-benefit tipping point between renewable and fossil fuels important to North Africa. More efficient solar panels, transmission means (through the application of superconductors and graphene), and improved storage will make the collection of solar energy for sale to Europe an important economic driver for North Africa. The possibility of compact fusion may offset renewables.

The ‘greenfield’ conditions in North Africa – the lack of existing infrastructure that would delay the incorporation of new technologies, will allow for faster adoption of ‘leap ahead’ technologies. Communications means and social media will change the way we communicate (e.g. what will be the “email of 2040”?) impacting social change and governance across North Africa. Advanced and readily available means of communication will also provide an avenue for disinformation, propaganda, and intelligence collection by North African governments and other governments and organisations operating in the region.

Labour structures will be changed through human performance augmentation supported by the ability to measure “achievers” vs “non-achievers” early in life. The sensitivity in the use and consequences of this information must be understood.

In the area of healthcare, universal or rapidly developed vaccines will be important as old and new pathogens interact with human populations in North Africa. The democratisation of healthcare by broadening access to a larger population, through lowering costs enabled by ubiquitous computing, artificial intelligence (AI), lab-on-chip, CRISPR genetic studies, etc. will improve the overall health of the population.

Genetically modified organisms will enable the ability to develop crops that are resistant to pests and extreme weather brought about by climate change preventing wholesale crop destruction and/or lower crop yields. Cheap desalination could completely change the agricultural prospects of North Africa. Food security will be supported through improvements in agriculture and the application of supply chain management tools and blockchain. The rise of mega-farming in the face of growing agricultural output may change the face of farming making property rights particularly important.

From a military perspective, the group focused on the growing affordability and accessibility of more powerful weapons and applicable training. The growing application of face recognition, computer vision, and other capabilities will allow micro-targeting and empower swarms.

- **Initial ideas for call for papers:**
 - Ethics in Technology
 - Renewables in 2040 in North Africa

4.1.4 Economics/Resources:

- **Analysis of trends and implications:**

With an expanding population of over 239 million (some 3% of the world population) North Africa is confronted by high levels of unemployment among the 15-24 age group (3.6 million) together with continuing population and economic pressures coming from economic, conflict and climate migration from the Sahel and sub-Sahel (where more than 12 million young people are unemployed). Although the regional economy has been growing significantly (real GDP growth in 2017 was 4.9 percent, up from 3.3 percent in 2016 and above the African average of 3.6 percent.), the combination of poverty, unemployment, gender discrimination, lack of economic diversification and reforms, growing public debts and persistent threats from radical Islamist groups may provoke significant social unrest and interstate conflict.

- **Key areas/concerns/issues:**

One in four young people in work live in extreme or moderate poverty and the 35% youth migration from North Africa seeking permanent relocation is much greater than the 20% global average. The lack of jobs for both the uneducated and educated fuels potential recruitment into extremism and organised crime with insurgency and insecurity coming from Islamic State, Al Qaeda in the Maghreb and other groups in Libya and Algeria, accompanied by rising tensions in Morocco, Tunisia and Egypt.

The North Africa region has the second highest gender unemployment gap in the world, after the Middle East, and female unemployment is nearly double male unemployment in Algeria, Egypt, and Tunisia. The participation rate of women in the labour force in North Africa was less than 16 percent in 2016, compared with 52 percent in the rest of Africa and 37 percent globally.

Fiscal expansion (food and energy subsidies, safety nets, and recruitment of youth in public enterprises in several countries) has been used to appease popular demands (Egypt and Tunisia) or maintain social peace in countries that did not experience heightened political unrest (Algeria and Morocco). However, rising public debts and growing current account deficits have necessitated fiscal consolidation and economic reforms that include reduced energy and food subsidies.

Among individual countries, Egypt's growth in 2018 is estimated at 5.3% with per capita GDP (in purchasing power parity) is \$10,900. Unemployment has declined to 9.9% overall in the second quarter of 2018, but youth unemployment is nearly 25% and female unemployment is over 20%. The main risks arise from a slow-down in reforms, and increases in global oil prices that would delay fiscal consolidation.

In Morocco, GDP grew by 2.8% in the first half of 2018, down from 4.0% in the same period in 2017, mainly due to declining agricultural output. Per capita GDP is \$8,648 and overall unemployment is around 10.5%. Downside risks include further delays in reform, the potential lowering of phosphate, wheat and vegetable prices and the vulnerability of agricultural activity to climate-related weather patterns. Morocco has strengthened its regional energy ties in pipeline and renewable projects with Nigeria, the Ivory Coast and elsewhere in the sub-Sahara.

Tunisia's growth accelerated in the first half of 2018 with improved economic confidence and tourism. Per capita GDP is at \$11,467 but inflation at 7.8% is at its highest level for more than a quarter of a century. Greater coordination is required between education, vocational training, skills development, female labour market participation and job creation in sectors such as renewable energy. In spite of the continuing insecurity coming from rival insurgencies seeking control of the energy sector and major urban centres, Libya has experienced improved economic performance due to higher production and export of oil with GDP growth of over 55% (the result of better security and international political and economic cooperation). Libya's per capita GDP (PPP) is measured at \$9,792.

North Africa has the largest oil and gas resources in Africa. Individually, Libya has the largest oil reserves (48 billion barrels), followed by Algeria (12 billion) and Egypt (3.5 billion). Algeria has the largest proven gas reserves in Africa (159 trillion cubic feet) after Nigeria, followed by Egypt (65 trillion) and Libya (53 trillion). These resources have resulted in substantial revenues for economic expansion (although widespread corruption and a lack of transparency and legal guarantees in contracts have dissipated some of these benefits) but demonstrated the critical importance of the petroleum sector in financing government budgets. The volatility of petroleum prices is transferred to government revenues, upsetting budget planning and impeding social and economic development.

- **Initial ideas for call for papers:**

How can NATO states provide meaningful economic and financial assistance to support internal stability in North Africa states and greater job creation with reduced migration to Europe?

Proximity to the European Union gives North African countries a unique advantage in attracting FDI. Morocco's political stability, strategic location, and good infrastructure (including the Tangier-Med port, located less than 10 miles from Europe and connected by rail and highway to free zones and industrial parks) have been instrumental in attracting considerable FDI in recent years.

What new initiatives should be developed to encourage greater population participation in economic and energy projects to promote greater inclusiveness and economic democracy?

What will be the future role of China and Russia in the area?

NATO's efforts to project its influence on the Southern Flank through its partners could encounter difficulties due to, among other things, the growing influence in the area of geopolitical rivals like Russia or China.

4.1.5 Environment:

- **Analysis of trends and implications:**

Climate change in North Africa will continue to challenge multiple social and economic themes with an increasing humanitarian impact as the effects of sea-level rise and predicted temperature increases converge. Lack of Governance will constrain the ability of North African states to manage the threats most notably in low-lying coastal regions and areas where disruptive weather patterns and extreme climatic conditions become increasingly common. Although climate change is the most dominant theme, natural disasters are likely to become common place as the effects of climate change are felt by increasingly stressed human/social factors. As such the Trends and Implications of the SFA and FFAO remain extant within the environmental field, but there are no new additions.

- **Key areas/concerns/issues:**

Humanitarian disasters are likely continue on the African continent, but there was no indication of a greater trajectory which would prompt NATO to re-examine the impacts and implications of humanitarian crises. Climate change in North Africa, however, presents a multi-faceted problem as the impacts of desertification and temperature rise, rising sea levels, decreasing arable land and access to water for consumption and farming combine and stress governments and populations that have limited ability to invest in adequate mitigation strategies.

Additionally, the impacts of climate change are not bounded within the environmental theme, but rapidly manifest in social, economic and other areas. A particularly problematic scenario emerged wherein the impacts of desertification could pressure populations to shift toward coastal areas, and rising sea levels could have the reverse impact of pushing populations inland. Adding to this the potential for loss of farmland, shortened growing season and lesser abilities to provide water for farming and the potentiality of climate change impacts manifest within North Africa.

Dialogue also briefly examined the competition between external, commercial entities and their desire for access to natural resources, but their seemingly 'blind eye' toward governance issues or investment or other efforts to improve the same.

- **Initial Ideas for call for papers:**

A Clash of the Environment – rising sea levels & temperatures and domino effects on populations
Multiple environmental pressures stemming from climate change have the potential to cause great disturbances to the population of Africa. With increasingly inhospitable inland temperatures and the potential loss of coastal population centers to rising sea levels, how will governments remain able to re-locate and adequately sustain their populace?

4.2. Part – 2: Russia and Eastern Europe:

4.2.1. Political:

- **Analysis of trends and implications:**

Russia is expected to continue to challenge the liberal world order that has become its primary strategic goal. Russia views a weakening of the liberal order as necessary to assert its own interests which in turn would lead others to treat Russia as an equal on the world stage. Russia is not seeking open conflict with the West but instead aims to undermine the West's confidence in norms, values, and institutions. Russia is especially interested in challenging the universality of Western norms and values as these emphasize democracy, transparency, and the rule of law. To accomplish its goals of weakening the West, Russia employs a variety of tools including but not limited to, systematic and sustained disinformation campaigns, violation of sovereignty (especially in the Baltic States) by air and sea intrusions, and an offensive tactical nuclear strategy that is made to appear defensive. Russia is careful to pursue these activities below the Article V threshold lest they invite NATO retaliation. Russia's military and non-military strategy is geared towards contesting NATO's sway in areas where Russia has strategic interests, most immediately in states that were part of the former Soviet Union. Russia aims to foreclose a future enlargement of NATO by undermining the alliance's resolve to keep its doors open.

- **Key areas/concerns/issues:**

For much of its history Russia has faced the notorious problem of power transition. Despite holding nation-wide elections, it is clear that the post-Putin leadership will be selected, not elected. Over the course of 14 years, Putin has put in place a tightly controlled and highly centralized governing system under his own personal management. His inner circle is held together through patronage and a potential successor is likely to be chosen by this circle which he largely controls.

Putin's centralized control hides deeply rooted Russian demographic and economic vulnerabilities. Life expectancy is far lower than in other developed countries and economic dependence on oil exports reveal Russia's failure to develop a viable manufacturing and service economy. The threat of civic unrest in the form of another color revolution is just below the surface and Putin has taken steps to limit the growth of civil society to stem the voices of democratic dissent.

As Russia is determined to carve out a strategically relevant space for itself, relations with China have warmed. While this should concern NATO and the West at large, this relationship is not one of equals. China is indisputably the more powerful player especially in economic terms and can invest abroad at a magnitude that Russia can only dream about. But Russia is painstakingly asserting itself whenever an opportunity arises as it demonstrates with claims on the Arctic and the militarization of its presence in the High North.

- **Initial ideas for call for papers:**

How can we create space for Russia in the International System?

As we have seen Russia asserting itself and exploiting opportunities to undermine Western goals, the West-Russia relationship has plummeted. The fact that Russia rejects the universality of Western values and norms means that Russia will continue to 'rub' against the liberal world order and clash with the West on a variety of issues. Traditionally, the West has aimed at 'bringing Russia in' expecting it to adhere to western standards of behavior. This effort has summarily failed. The critical question now is whether a Russia that rejects the liberal order can nonetheless be accommodated. In other words, are there areas of cooperation that can be targeted without demanding that Russia adopt a western-style democracy? Can the West build a long-term relationship with an autocracy and to what extent would Russia be willing to compromise? The need to better understand Russia is urgent as the current relationship is fraught with acrimony and suspicion. In the absence of strong arms control measures, this urgency is even greater.

How can we revitalize confidence-building measures (CBMs)?

CBMs have a long history in East-West relations going back to at least the 1970s. The 1990 CFE Treaty was the culmination of these efforts but it is largely defunct now. At the same time, relations with Russia are in dire straits and need to be put on a more cooperative footing lest misunderstandings and miscalculations lead to violent conflict. That is precisely what CBMs were initially created to prevent.

4.2.2. Human:

- **Analysis of trends and implications:**

Life expectancy in Russia, especially among working-age males, has dropped precipitously. The Russian fertility rate has declined to among the world's lowest. As a result, for the first time in

Russian history, the population is aging rapidly with the annual number of deaths exceeding the number of births. Significantly larger flows of immigrants from the former Soviet Union have been entering Russia for the last twenty years creating significant Muslim societies especially in large Russian cities. Many of the immigrants coming to Russia are able to earn much higher wages than they could in their home countries. Therefore Russia will suffer disproportionately from aging and negative net growth rate, which will put considerable stress on the national budget to provide the necessary resources for medical and social welfare.

Russia has high level of urbanization, urban population reached 73% in 1990, and the rate of urbanization over the past 25 years historically sits at this level, while the low birth rate has become a major factor in reducing the number of urban residents. Concluding urbanization is not a significant trend in Russia, but the situation in their population centers contributes to the vulnerability of Russia.

Russia faces a number of social and economic problems that have resulted in some unrest, mainly in the urbanized areas. Especially after oil prices dropped in late 2014, the country began to see economic and labor protests. Since then, unrest has spread across Russia. Furthermore, elections are mostly meaningless and the declining approval rating is troublesome for a one-party political system. Even though, typically for a one-party political systems, political polarization is low. Compared to Western countries it is almost non-existent.

80% of the population has internet access and is well connected through a wide range of digital and non-digital networks. Internet censorship in the Russian Federation is enforced on the basis of several laws and through several mechanisms and since 2012, Russia maintains a centralized internet blacklist. Therefore, particularly the digital network trend is more insular because of the restrictions imposed by Russian authorities. This trend increases the role of non-digital/social networks.

- **Key areas/concerns/issues:**

Russia has over 100 recognized nationalities while the non-ethnic Russian population is constantly growing because of the continuing influx of migrants. Additionally the problem of a rapidly aging ethnic Russian population and a decreasing birth rate within the ethnic Russian population might stress the ethnical balance within the Russian security forces reaching a point where the potential reliability and allegiance of foreign-born soldiers in the Russian army might be questioned as previously seen during Russia's invasion of Afghanistan in the 90s. This also might degrade the expeditionary capabilities of the Russian forces.

In recent months, Russia, previously seen as stable and even apathetic, has been rocked by mass protests against fraudulent elections and Vladimir Putin's rule. Nevertheless the Russian population is apparently used to being suppressed for centuries by an either Czarist or Stalinist regime, which leads to the question of where the tipping point for a revolution or even a wide scale civil unrest is. History suggests that it is very high for Russians and many other East Europeans. A special focus should be on the North Caucasus Region where a series of suicide bombings ahead of the 2014 Winter Olympics brought new attention to Russia's instability.

Furthermore, these recent protests in Russia brought the attention to Russia's internal dissatisfaction creating speculation that the chance of foreign adventures may increase as a distraction and to sidestep public unrest. Fractured societies and polarized societies within Russia might be used by the state to trigger internal and external actions. Consequently, external threats are even more necessary to cover internal fractures.

The separate insular nature of Russia's digital network makes censorship and shaping the narrative easier in the digital domain. Consequently there is the necessity to take a closer look at non-digital social networks such as the Orthodox Church which is coopted by the state to advance its goals. On the contrary, diaspora and hacker networks constantly work against Russia's narrative.

The role of the Russian diaspora has to be evaluated closer because it can potentially pose a double threat, as a source for a hostile intelligence network and as well as a pretext for hostile actions.

- **Initial ideas for call for papers:**

What does political polarization in an authoritarian society mean?

4.2.3. Technology:

- **Analysis of trends and implications**

In consideration of the role of technology in Russia and Eastern Europe in the future, the syndicate continued to consider the list of broad categories that would likely have significant technological aspects that would influence the trends and implications across the region. These categories were global influences, communications, business/commerce, environment, energy/resources, education, labour, healthcare, military, infrastructure, and governance/culture. Broadly speaking, many of the trends and implications discussed for North Africa will also impact Russia and Eastern Europe in the future, albeit with different specific manifestations, implications, and results. However, much greater emphasis was placed on the trends in the military category in Russia and Eastern Europe vice that of North Africa.

- **Key areas/concerns/issues**

In addition to many of the ideas presented for North Africa which also had relevance, the group gathered insights of other issues related directly to Russia. In the category of technological issues related to the environment, the group highlighted concerns with the ability to operate under extreme cold conditions and technologies related to remediating hazardous material waste sites (nuclear/chemical) in Russia.

Within governance, the group found that there is a strong motivation within political leaders to empower technological leadership. This has led to a small but highly educated group of people to support the development of advanced military systems and weapons. Related to governance, there will continue to be strong criminal structures in the region which will continue to engage in criminal activity enabled by technology such as cyber.

As renewable energy reaches a tipping point, the most important economic driver in the region – oil and gas – will not provide the demanded resources to support government activity.

There is no indication that social media interference on the part of the government will not continue as a societal control mechanism. There will be a demand by the government for strong tools (such as AI) to moderate social media.

Synthetic biology supported by dual-use facilities (the same laboratory could be used for agricultural and weapons development purposes) could become a more important issue. Especially if existing arms control mechanisms/regimes continue to be diminished.

Critical infrastructure protection will become an increasingly important factor given the growing accessibility, through advanced autonomous systems, of pipelines and telecommunications lines.

Cyber deterrence will be significantly effective with accurate attribution tools and cognitive cyber protection.

The group gathered some thoughts on military systems that could be improved through advancing technologies including:

- Requirement for autonomous systems and the ability to counter autonomous systems (ground, maritime, and air systems)
 - Space situational awareness
 - Anti-satellite weapons/protection of our systems (hardening, stealth, maneuverable)
 - Weaponisation of space (kinetic, directed energy weapons, debris). Related to this is the requirement to increase NATO resilience to the loss of space systems
 - Hypersonic weapons/defence against hypersonic weapons
 - Systems to counter A2/AD (Cognitive Electronic Warfare, stealth, etc.)
 - Emerging classes of WMD
- **Initial ideas for call for papers:**

Given the large base of literature for technology with respect to Russia, there were no proposed ideas for calls for papers.

4.2.4. Economy/Resources:

- **Analysis of trends and implications:**

Russia's economic security and future are inextricably bound up in five major trends: the continuing dependency on oil and gas revenues and prices; the juggling and management of state budgetary expenditures on non-military and military spending; the vital need for economic restructuring and large infrastructure investment across the vast continent; the ability to reverse a declining population (144 million in 2018 compared to 146 million in 2015); and the future of economic, financial and technological relations with China and the West.

- **Economic security and reforms:**

After a two-year recession, GDP grew by 1.5% in 2017 and 1.6% year-on-year in the first half of 2018. The recovery of household consumption and exports has underpinned this growth. However, without significant economic and financial reforms and external investment, Russia's long-term economic growth path is destined to remain in the 1-2% range. This is a result of outmoded and neglected productive capacities, low investment and weak demographics, obsolete infrastructure and unreconstructed economic and financial institutions.

The government has introduced tax and controversial pension reforms, including the October 2018 law that will gradually raise the retirement age for men from 60 to 65 by 2028 and for women from 55 to 60 by 2034. The widespread protests that greeted these announcements demonstrated the politically dangerous vulnerabilities and concerns of a population where the life expectancy of men (66) and women (77) (compared to 76 and 81 in the USA). The government has also implemented measures to increase the birth rate with incentives to new mothers and for mothers with three or more children.

However, it is extremely unlikely that these reforms will repair the fundamental and structural weaknesses in the Russian economy notwithstanding the impact of the FIFA 2018 World Cup that injected a temporary increase in public investment. There has been a substantial improvement in

doing business through access to and granting of construction permits but Russia's global competitiveness is significantly constrained by weaknesses in the financial system (especially with regard to financing SMEs) and product and labour markets as well as institutions.

- **Budgets:**

While government revenues have increased due to higher oil prices and increasing oil and gas receipts, government expenditures have fallen due to lower defence spending as well as an extension of the freeze in pension contributions and civil servant salaries.

- **Resources:**

Oil and gas exports are responsible for 40 per cent of Russia's federal budget revenues. Russia anticipates that its oil and gas revenues will in 2018 increase by 500% compared to the expected revenues that were reported in its 2018 budget, leading to a budget surplus for the first time since 2011. However, its previous forecasts were predicated on the assumption that the Urals crude blend would average around \$40 a barrel compared to the actual \$66.15 during the first quarter of 2018 (this windfall will probably be allocated to Russia's State Budget Reserves). The recovery of oil prices was accompanied by the rouble's appreciation against the US dollar in 2017 (around 15 per cent) and in early 2018. However, foreign exchange interventions triggered by a new fiscal rule, together with the new US sanctions against Russia (which provoked a sell-off of Russian financial assets) exerted downward pressure on the ruble after April 2018.

- **Russian defence spending:**

In 2017, Russia's military spending (approximately \$66 billion) was 20% lower than in 2016, the first annual decrease since 1998. Russia has signalled that peak defence spending is over following substantial investments in the modernisation of its armaments and military equipment. It has been forecast that military spending will decline to 1.5% of GDP by 2024.

- **Initial Ideas for call for papers:**

How can Russia be supported in meeting the IPCC global warming target of 1.5 degree C?

Russia will struggle to implement the urgent climate change measures outlined in the October 2018 Intergovernmental Panel on Climate Change Report in the absence of alternative sources of revenue and new energy technologies.

What will be the emerging economic and energy relationship between Russia, China and Central Asia taking account of the symbiotic relationship between Russia and Western Europe?

Russia will continue to provide more than 30% of Western Europe's gas consumption while further deepening its energy and economic partnerships with China (partly in the context of China's Belt and Road strategy and mutual relationships with Central Asia).

It will be vital for Russia to considerably improve its business relationships with China, Eastern Europe and NATO states by strengthening property rights and its legal frameworks to increase international trust in Russia. Russian energy infrastructure network (pipelines, refineries) has traditionally covered Eastern Europe and Russia will seek to strengthen this energy partnership by moving energy investments downstream and co-locating new petrochemical facilities with refineries to generate operational synergies.

4.2.5. Environment:

- **Analysis of trends and implications:**

The impact of climate change and the potential for natural disasters is arguably more prevalent in Russia than any other region. Gross variation in temperatures and climatic conditions are predicted and therefore the influence of a changing environment will both challenge and offer opportunity to Moscow. The Arctic remains the most obvious sector for development but the wider impacts in central Siberia are yet to be understood. Areas such as migration could have potential for dramatic fluctuation once the dividend of climate change yields natural resources and increased access. The ability of disruptive weather patterns to restrict growth and the impact of perma-frost degradation will further influence the development but the Trends and Implications of the SFA and FFAO are ultimately upheld.

- **Key areas/concerns/issues:**

The impact of climate change in Russia is portrayed nationally as opportunity. Favourable climatic conditions in central Russia may improve resource access and crop yield (food security remains an increasing concern to Moscow). Yet the reality of perma-frost melt; especially in terms of ingress/egress infrastructure which includes natural resource extraction, CO2 emission rise, unpredictable weather patterns, and increased maritime access for non or near-Arctic actors into Russia's back yard is likely to increase Russian sense of insecurity and represent more challenges in the near-term than opportunity.

Nuclear waste disposal of legacy military and industrial infrastructure represents a diplomatic dilemma for the current regime contrasting the requirement to seek external help (EU assistance to dismantle aging fleet) and the perception of weakness. The significant impact of contamination on the environment is still to be determined, but open dialogue by NATO will not dilute the Alliance position of deterrence. Increased access to the Arctic/High North will increase the demand to expand NATO's maritime AO, although recognized governance mechanisms will best determine cooperative resilience in the commercial sector.

- **Initial ideas for call for papers:**

The decline of Perma-frost – opportunity or misconception in the High North?

Understanding the true potential of climate change in the High North. What are the real term cost impacts to the Arctic Nations; does access and infrastructure requirements outstrip potential yields and will this determine a reversal in migration flow. Or is climate unpredictability going to have a detrimental effect.

Russia's Nuclear Legacy – Environmental catastrophe?

Further research into what lies under Russia's frozen North and what might be the environmental impact is required. EU assistance in legacy Nuclear Fleet may provide an indication of what to expect and how to manage. Does NATO have a role or a responsibility to play in assisting Russia? Can Russia accept external assistance from a competitor?

4.3 Part – 3: The Arctic/High North:

4.3.1 Political:

- **Analysis of trends and implications:**

With the last decades of sea-ice decline, the Arctic and High North have received increased attention from several nations. Easier access to natural resources and shorter sea lines of communications between Asia and Europe, may lead to significant economic and political gains. For the moment Arctic seems to be an area of peace, stability and cooperation. However, there are many indications on increased competitive national positioning to exploit future options in the Arctic, including infrastructure building, research activities, commercial activities and increased militarization. In the future, thriving economic activities in the Arctic and increasing competition for natural resources may lead to heightened tension and competition between nations. Further analysis of trends indicates that:

- **Redistribution of geostrategic power:**

China. This trend has China “written all over it.” By joining the competition for resources, China will challenge rules-based order (India also to a lesser extent) and may seek to cooperate directly with Canadian native peoples in Nunavut. Increased research competition, notably in “tech” and economic investment strategies, the imbalance of icebreakers between Russia and US, and the question of Greenland’s alignment, potentially leaving Denmark and moving closer to Russia or China, presents challenges.

- **Use of power politics:**

Increased militarization will see the involvement of NATO increase; 4 or 5 NATO members are already in the Arctic Circle, but the Arctic remains a nationalist issue, divergent on risk and threat perception for countries like Russia and possibly Norway. A possibly increasing role for NGOs, especially since the Arctic is a global issue could see States use companies or NGOs to support strategic goals. As the stakes increase, states will increase their commitment to defend these investments. Additionally, an increased gap in cyber operations, especially given the limited population and the potential for “piracy fishing” are two examples of the unique nature of the region.

- **Non-state actor influence in domestic and international affairs:**

Increasing role of environmental organizations, some even violent, such as against Japanese fishing trawlers signals a bigger environmental role in single-issue politics. An increased need for protection of infrastructure (environment and terrorist) and an uplift for multinational regulations and agreements (e.g., navigation) to include the need for augmented SAR resources— public and private.

- **Challenges to governance:**

The Arctic is and will remain a difficult to govern area with most governments lacking a persistent presence. With and increased risk of competition, conflict over claims (the new Middle East?), are countries positioning themselves toward cooperation or competition/conflict? Might the fact of declining Russian population push Moscow to quicker action in the Arctic and could Russia, China, and an independent Greenland propose an alternative multilateral structure to the Arctic Council with alternate governance structures, public discontent/disaffection and increased tensions. Will claims of legitimacy be undermined by disinformation, will scientific research

continue to be influenced by political goals and how high-value resource targets that might tempt an “Arctic ISIS” or other terrorist group into action is yet to be determined.

- **Key areas/concerns/issues**

- Greenland – what if Greenland leaves Denmark (Strategic shock?)
- NEP vs Suez vs Panama, what is the impact on global trade and SLOC (Jellyfish about to start?)
- Environment and climate change (Jellyfish already started?)
- Russian Militarization (Elephant)
- Balance between cooperation and competition
- Increased risk of competition
- Will more people move to the Arctic as it warms up and natural resources get more available?
- BMD. Why has there been no ballistic missile defense equipment introduced in the Arctic region (besides submarines).
- Submarines increasingly vulnerable due to technology advances...“transparent oceans.”
- Countries building military capabilities or scientific/climate research to establish presence, countries expressing views or investing in the area – these could be good indicators.
- Panama and Suez. What are the implications of increased Arctic shipping for Panama and Suez Canal economies? (a Jellyfish)
- More People/Migration to the Arctic (currently only ~4 Mil).

- **Initial ideas for call for papers**

- What is the possible economic/security/social impact of the opening of the Arctic SLOC on the Suez and Panama Canals?
- How to increase Confidence and Security Building Measures (Increase cooperation instead of competition with Russia)?
- How will/can increased military and economic cooperation between China and Russia impact NATO?
- Increased militarization in the Arctic

4.3.2 Human:

- **Analysis of trends and implications:**

Broadly speaking, there are approximately 13.1 million individuals residing in the area of the Circumpolar North, representing considerably less than 1% of the total global population. A large majority of the total, some two-thirds, is found within the borders of one country, Russia. Even today predominantly young male workers whether they are from Azerbaijan, Turkmenistan, Russia or Canada, are now looking northward for new employment opportunities and are migrating accordingly. The continuing climate change and consequently even more accessible resources will be the biggest driver of demographic changes in that region.

Today, there are 11 northern cities that lie north of the Arctic Circle or close with populations larger than 250,000 — ten of these are found in Russia. Nearly 70% of the country's northern population can be found in such locations. Thus, urbanization in the region is almost maxed out

unless climate change is really changing the environment totally. Consequently urbanization is a still a trend but at a much smaller scale.

Because of the influx of migrants and Greenland's potential for independence, symptoms of a fractured and polarized society are likely to occur, but without a huge external impact.

For many people in the Arctic region the use of information and communications technologies has become part of everyday life. Currently the rate of internet penetration in the region is about 70%, but there are huge differences in the region. Even though the penetration of internet is limited, the consequences are more limited. Additionally technology, especially facilitating digital networks, may radically change traditional societies.

- **Key areas/concerns/issues:**

As mentioned before, there is a potential for an increased and overwhelmingly young male influx of migrant workers to the region caused by the growth of the extraction industries. Another factor exacerbating gender imbalances, at least in Greenland, is that educated women tend to emigrate southwards to seek employment opportunities. Additionally, migration and other factors might cause the level of urbanization in the Arctic to surpass 70% by mid-century, causing significant changes in local societies and cultures. Given the small population of the region, small numbers of migrants can quickly tip the balance as a percentage of the total. Thus, further fractures and polarization might arise when the indigenous population tries to relate to non-indigenous influx. Additionally the effects of climate change to the habitability and exploitability of region might further reinforce fractures and polarization.

The opening of the second mosque in the Arctic raised questions about religion in the region. While Pakistan's program at Jinnah Antarctic Station brought Muslims to Antarctica in 1991, the influx of migrants from Islamic countries might create additional fractures and cause polarization between the non-indigenous and the indigenous population.

China and India have long-term strategic interests in the Arctic and economic interests are part of the reason why China and India are drawn to be active in the region. This makes the region more attractive to migrants from these countries reinforcing nationalistic tendencies in the receiving nations. Russia on the other hand is trying to exploit ethnic issues by targeting Russian-speaking Finns about their treatment by Finland. Therefore the question how nationalism caused by migration or ethnicity may be weaponized has to be explored further.

In 2008 the people of Greenland voted 3-1 in favor of a plan for greater self-government. On its own, Greenland would be the 13th largest country in the world in area, but in terms of population, it would not even make the top 200. What affect would an independent Greenland have on the region and what would it mean to its population?

Arctic wildlife, landscapes and ecosystems are increasingly disrupted by the exploitation of the natural resources and by tourism. Many Inuit and environmentalists around the world argue that any oil and gas exploration could damage a fragile ecosystem. Canadian Inuit groups already tried to block offshore drilling near their communities. Thus, the exploitation of the Arctic might have a hefty influence on social movements around the world.

Since the end of the Cold War, north of the Arctic Circle has generally been a demilitarized zone. Rising temperatures are contributing to a decline in the amount of ice. Less sea ice means previously unreachable resources can now be accessed. Nations therefore are militarizing the Arctic to guarantee their access to these resources. In addition, Russia also uses nuclear power in

the Arctic region for multiple applications creating nuclear pollution and causing a growing anti-military and anti-nuclear movement in the region and around the world.

- **Initial Ideas for Call for Papers**

How the smart Arctic project impacts the human domain in the high north?

4.3.3 Technology:

- **Analysis of Trends and Implications**

In consideration of the role of technology in the Arctic region in the future, the syndicate continued to consider the list of broad categories that would likely have significant technological aspects that would influence the trends and implications across the region. These categories were global influences, communications, business/commerce, environment, energy/resources, education, labour, healthcare, military, infrastructure, and governance/culture. Again, broadly speaking, many of the trends and implications discussed for North Africa and Russia/Eastern Europe in the future will also impact the Arctic, albeit with different specific manifestations, implications, and results.

- **Key areas/concerns/issues**

Given continued global warming, increased activity in the Arctic region will drive the need for improved communications. This will be supported by larger constellations of mini-satellites in low-earth orbit on more elliptical polar orbits. Improved information infrastructure will increase access throughout the region and support other technologies raised below.

Autonomous systems will support energy exploration, mapping, transportation and other tasks. These systems will have to operate in a harsh, cold environment and will provide persistent regional presence. The rise of a zero carbon economy will likely reduce oil and gas exploration but will likely not impact the search for other important minerals in the region.

Access to healthcare will be improved through remote medicine supported by AI, communications, and robotics.

Better technologies for the remediation of environmental disasters will have to be developed given the growing human presence within the region. This will be supported by new technologies and techniques in cold weather engineering. Currently, systems developed for operations in the south may not operate in the north, but new materials and engineering developments will likely change that paradigm.

New transportation technologies, such as a hyperloop for the Arctic, will make transportation of fresh water, other goods, and people more economical. It will also support the building of new communities which will contribute to increased tourism in the region. However, construction will be difficult given the evolving state of the permafrost and will require innovation in cold weather construction techniques.

Weather engineering/modification may become a possibility in the region but would come with many ethical concerns and far reaching impacts regionally and globally.

Improved situational awareness will be critical.

- **Initial Ideas for call for papers**

Cold Weather Engineering Technologies and Techniques; Robotics in the Arctic.

4.3.4 Economics/Resources:

- **Analysis of Trends and Implications**

With an annual economy presently exceeding \$450 billion, the Arctic region will experience further growth as conditions and investments facilitate this transformation. It will be vital for Arctic states and members of the Arctic Council to regulate this growth in order to ensure protection of the environment, indigenous peoples, and their own strategic interests. This will further require significant cooperation amongst the nations of the High North in order to ensure the development and adherence to protocols and regulations that guide economic development

The recent success of the purpose-built Christophe de Margerie ice breaking liquefied natural gas carrier highlights the potential of destination shipping and the movement of bulk resources (such as oil, gas, liquefied natural gas, or minerals) from the point of extraction to markets outside of the Arctic region. However, transit shipping is far more problematic since shipping companies rely on economies of scale and on-time delivery with their container ships. The "just in time" approach to inventory management is extremely difficult given the operating challenges of the Arctic, with poor communications and satellite coverage due to atmospheric phenomena, latitude challenges, and ionosphere effects.

- **Key Areas/Concerns/Issues**

The intensification of competition for energy and other strategic minerals and resources greatly increases the risks of interstate conflict over the economic potential and security concerns brought about by climate change. It is increasingly evident that geostrategic location and increasingly navigable seas raises the importance of the High North for global trade, strategic resource extraction, and military activity.

The lack of infrastructure in the region highlights the constraints on such developments. While Russia has invested heavily in improving its Arctic infrastructure to facilitate the extraction and movement of resources to markets, the region generally remains underdeveloped. Hydrographic surveys, channel markers, deepwater ports, and emergency response units are mainly absent in the region and pose serious operational challenges.

In contrast to global shipping numbers, the Northern Sea Route transit numbers currently pale into insignificance. In 2017, the Centre for High North Logistics identified a mere 24 vessels (194,364 tons of cargo) transited through the Northern Sea Route compared to 17,600 vessels (1.04 billion tons of cargo) that transited the Suez Canal that year. There has been a decline in traffic along the Northern Sea Route since the peak in 2013 with 71 vessels and 1.36 million tons of cargo (as compared to 16,600 vessels and 915 million tons of cargo through the Suez Canal in 2013) due to more challenging ice conditions.

According to the risk analysis of the Data Center, the Arctic has the lowest risk environment for data centers (natural disasters, energy security, political stability, internet bandwidth, corporation tax) lowest risks: Iceland, Norway, Finland, Sweden and Canada. Exploitation of the digital potential of the Arctic and High North will be highly sensitive to the escalating global consumption of electricity The amount of energy consumed by the world's data centers forecast to triple by 2030 (Japan will have exhausted all of its electricity supply at this rate of growth)

- **Initial Ideas for Call for Papers**

What are the potential risks and impacts of China's "Belt and Road Initiative" on the Arctic High North?

China's economic and policy interests in the Arctic are increasingly evident. Where does the emerging Blue Economy fit in relation to China's interest in the Arctic? What kind of accountabilities do we want for China and the Arctic?

To date, the Arctic has received significant levels of FDI, with China being the largest source at an estimated \$1.4 trillion invested into the economies of the Arctic nations from 2005-2017. Concerns arise over the potential for externalities associated with this investment, particularly given China's record on labour and environmental issues. China's recent Arctic White Paper establishes that China will continue to seek investment and other economic opportunities in the region.

4.3.5 Environment:

- **Analysis of Trends and Implications**

Climate change in the Arctic and High North will continue to both challenge and offer opportunity with increasing importance as its impact becomes a reality across all domains within the region. Not only will this manifest in the long term planning horizons of states and the Alliance but increasingly the impact will be felt in the medium term as national, regional, and international ambitions to tackle climate change issues continue to diverge. Furthermore, most internationally recognized models for temperature measurement, sea ice reduction, and sea level rise are being outstripped by the pace of change. Although causes remain widely debated the impact is acknowledged with disruptive weather patterns and receding/fractured sea ice becoming increasingly common. As such the Trends and Implications of the SFA and FFAO (Climate change and Natural disasters) remain extant within the environmental field, but there are no new additions.

- **Key Areas/Concerns/Issues**

The exponential rise of human activity in the region due to rapid changes in climatic conditions will continue to challenge the pristine nature of the environment. Continued political cooperation will remain central in maintaining balance and protection of the ecosystem, but to what extent the ambition of Russia and China destabilizes current governance norms remains unclear. Environmental impacts from climate change, although not fully understood will create unpredictable weather patterns and continue to make commercial exploitation a challenge – commercial yields unlikely to manifest as rapidly as many predict, the rush for the Arctic maybe a slow walk.

Reinforcement of recognized international legislation for operating in the region will need addressing in order to build resilience and protection of the Arctic's future. A competing environmental narrative with the commercial sector is already underway, this will be tested further as near or non-Arctic states seek increasing access to operate or transit the region, with freedom from responsibility. The immediate threat to the environment remains most obvious through shipping or oil spill disaster, greater cooperation to enable with SAR and prevention through law enforcement could see an enhanced role for NATO.

Furthermore, eco-system imbalance induced by climate change will also determine a more unpredictable future; fish stock migration, coastal erosion, and the impacts to perma-frost

degradation present both challenges and opportunities which are not understood. Political environmental lobbying should not be underestimated as it is backed by powerful popular consent. Finally, Arctic governance to protect the environment may yet prove to be a source of optimism with increased interdependency and common interests, equally if unmanaged this may become a foundation of tension as non-traditional near-Arctic actors push for increased access.

- **Initial Ideas for Call for Papers:**

The decline of Perma-frost – opportunity or misconception in the High North?

As per the Russia Call for Papers/Research.

The IMO: potential to install Arctic resilience. Further research requirement – does the IMO intend to produce a resilient Arctic Operating policy; what are the tangible outcomes of the Arctic Council resilience report.

5. Conclusions:

- **North Africa:**

- Radical political manipulation of Islam will likely drive an amplification of the polarization of western societies.
- High unemployment could fuel potential recruitment into extremism and organised crime.
- North Africa has the largest oil and gas resources on the continent, but volatility of petroleum prices is transferred to government revenues, making budget planning difficult and impeding social and economic development.
- Climate change may present a multifaceted challenge in North Africa as desertification decreases arable land, pushing populations toward coastal areas, while rising sea levels may have the reverse effect.
- Uncontrolled urbanization and governments failing to provide basic needs will only serve to increase migration and the risk of pandemic disease outbreaks.
- Advances in technology may benefit the region in the form of more cost-efficient transmission and storage of solar energy; drought and pest-resistant crops; improved desalination for irrigation; and greater access to lower cost health care brought on by ubiquitous computing, AI, and genetic studies.

- **Russia / Eastern Europe:**

- President Putin's centralised control over Russia hides deeply rooted demographic and economic vulnerabilities.
- With a lower-than-average life expectancy, and over 40% of federal budget revenue tied to oil and gas exports, Russia has failed to develop other viable economic engines of growth and faces a high risk of social unrest.
- The non-ethnic Russian population continues to grow, while the ethnic Russian population is rapidly aging and experiencing a decreasing birth rate.
- The government has introduced unpopular pension reforms, which will gradually raise the retirement age, while freezing pension contributions and civil servant salaries.
- Although the Russian government has portrayed climate change as an opportunity for improved resource access and crop yield, the reality of perma-frost melt, rise in CO2 emissions, unpredictable weather patterns, and increased access to the High North, equally present challenges.

- Technology, specifically the insular nature of Russia’s digital network, has enabled President Putin to censor public opinion and shape the narrative.
 - Faced with these social and economic stressors, the Russian government has shown a predisposition to utilize conceived external threats to distract from internal fractures.
- **Arctic/High North:**
 - As the competition for energy and other resources increases in the Arctic/High North, so too does the risk of interstate conflict. Currently, maritime traffic through the Northern routes pales in comparison to more established routes, and with unpredictable conditions and little to no infrastructure, commercial exploitation is unlikely to manifest as rapidly as many predict.
 - The unique environmental challenges will drive the need for technological solutions such as improved communications, cold-weather construction, and autonomous systems to support energy exploration, mapping, and transportation.
 - A potential increase in access could lead to an influx of migrant workers and tourists which may have negative impacts to the ecosystem and indigenous population.
 - Nations such as China, India, and Russia have all expressed long-term strategic interests in the region and will most likely continue to invest commercially and militarily to guarantee future access. Continued political cooperation and regulation will be critical in maintaining the balance of competition.

6. Way-ahead:

This workshop provided a forum for open and frank discussions on the key areas, concerns, and issues in the respective regions. Therefore, this report should be read as a reflection of the discussions during the workshop and breakout sessions, and should not be perceived as the views of the Alliance or ACT on any particular subject.

It is increasingly clear that there are diverging National views and interests in these respective regions. The SFA Budapest workshop started discussions on the regional perspectives that will help to understand these differences and find areas that could help to build a shared perspective of the security environment.

The outcome of these discussions will set the stage for the follow-on regional workshops and the development of the regional perspectives reports in 2019. Separate workshops will be dedicated to each region to allow for a focused discussion on how the themes and trends in those areas may impact the future security environment. The reports from those workshops will serve to inform the next SFA report scheduled for release in 2021.

Possible timeline to move forward for regional reports development as follows:

- North Africa: Regional Perspectives Workshop: 2-4 April 2019, Madrid, Spain,
- Russia Eastn Europe: Regional Perspectives Workshop: 17-19 June 2019, Helsinki, Finland
- Arctic High North: Regional Perspectives Workshop: 16-19 September 2019, Oslo Area (TBC), Norway

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