



Ministry  
of Defence

Development, Concepts and Doctrine Centre

## Global Strategic Trends programme.

### Connections UK – Wargaming Professionals – 7 Sep 17

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*'The nation that insists upon drawing a broad line of demarcation between the fighting man and the thinking man is liable to find its fighting done by fools and its thinking by cowards.'*

Lt Gen Sir William Butler



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- **Complex and uncertain strategic context.** Proliferation and speed of information flows, characterised by a state of constant competition that blurs traditional distinctions between war and peace; foreign and homeland threats have also merged. Potential adversaries blend conventional and unconventional forms of conflict, using both attributable and non-attributable methods.
- **Overcoming our adversaries** – who think, react and adapt, requires Defence to optimise its professional ability to anticipate, learn and adapt. As well as being adaptable, the UK's armed forces will also need to be agile, both physically and mentally.
- **The conceptual component** provides commanders with the ability to understand the context within which they operate and serves as the foundation upon which creativity, ingenuity and initiative may be exercised in complex situations. The conceptual component comprises three elements: the principles of war; doctrine; and conceptual innovation.
- In the past we have been accused of getting this **wrong**:

- Field Marshall Erwin Rommel *'The British write the best manuals in the world...thank God they don't read them.'*

- Chilcott Report: evidence based decision-making rather than decision-based evidence making...

- Of course, mental agility becomes increasingly important in an age of austerity: Winston Churchill *'Gentlemen, We Have Run Out Of Money; Now We Have to Think.'*



### **Research & Technology**

Out to 2050 further improvements in the reliability and endurance of automated vehicles will extend the geographical range and depth at which they can operate. Autonomous technology is increasingly being used to gather information and provide real-time monitoring within the Arctic and we can expect to see further use of unmanned vehicles to improve mapping of the region's oceans and monitor their usage. Canada and Russia are already investing in these to improve their monitoring of the Northern Sea Route and the Northwest Passage, and the US Navy is using unmanned vehicles as part of its research into sea ice conditions. Autonomous systems are expected to be used increasingly within the High North in activities from shipping and ice-breaking to drilling, mining and search and rescue. There will, however, be specific Arctic challenges for Autonomous systems to overcome, such as the severe weather and ice floes.

### **Access**

**Resource.** There is likely to be greater exploitation of Arctic energy resources out to 2050, although the High North will remain a difficult region in which to operate. It is estimated that the Arctic seabed contains 13% of the world's

undiscovered oil, 30% of undiscovered natural gas and 20% of undiscovered natural gas liquids

The Arctic contains sizeable proven mineral holdings and is likely to hold significant undiscovered deposits which may be exploited in the future, including nickel, gold, silver, zinc and molybdenum, gypsum, copper, iron, tin, platinum, lead, titanium and diamonds.

The High North is expected to become an increasingly significant source of fish out to 2050, especially if more southerly species continue to migrate northwards.

**Shipping.** As Arctic sea ice reduces we are likely to see the opening up and expansion of shipping routes across the Arctic region. Russian waters will open up more rapidly than those around Northern Greenland and the Canadian Archipelago, favouring an increase in Russian activity in the Arctic by 2050.

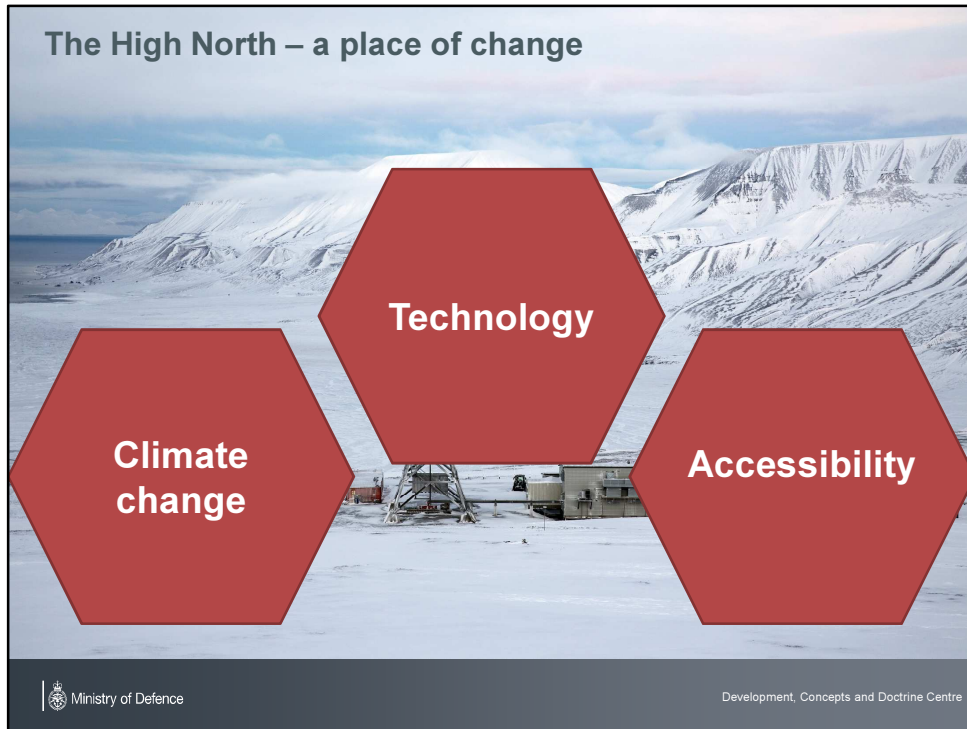
### **Security**

The increasing militarisation of the High North makes the future uncertain for the UK. Seven out of the eight Arctic states are either NATO or EU allies; Denmark, Finland, Iceland and Norway are all members of the Northern Group of Nations. Hence any likelihood of conflict in the region could have profound implications for the UK out to 2050.

Increased activity in the region will create new threats – and Arctic stakeholders will be keen to boost their presence in the region to protect their interests. It is highly probable that out to 2050 the High North will see further investment in surveillance, patrolling and security infrastructure, and an increasingly militarised High North, particularly in the Russian Arctic, remains likely.

### **Geopolitical**

The Arctic's place in the world. The Arctic's relative geographic isolation will reduce out to 2050, as the region comes to play an increasingly significant role in global trade and the global economy. The last decade has witnessed a growth in formal declarations of Arctic strategies and policy frameworks from both Arctic and non-Arctic states, including the EU, Japan, the UK, and Germany. While others, such as China, have not issued any such formal statements, they increasingly appear to regard themselves as Arctic players, and can be expected seek to play a more significant role in the region out to 2050.



## **Environment**

**Temperature:** Out to 2050 average surface temperatures in the Arctic are expected to rise by between 1 and 3<sup>0</sup>C, causing snow, sea ice and glaciers to melt more rapidly. Based on current trends it is forecast that the yearly average surface area of sea ice will reduce to 8.9 million km<sup>2</sup> by 2050 compared to the yearly average of 12.24 million km<sup>2</sup> measured over a 1979 to 1999 base period

**Ice Melt:** The mass of the Greenland ice sheet will reduce out to 2050, as ice that melts in the summer is not being fully replaced each winter. Since 2002 the Greenland ice sheet has reduced by an average of 269 Gt per year since; this meltwater largely ends up in the North Atlantic Ocean, changing the chemical balance of the ocean waters, causing disruption to ocean currents and affecting global weather patterns. If the whole of the Greenland ice sheet were to melt, the global sea level could rise by over seven metres.

**Melting Permafrost:** By 2050 the area of the near surface permafrost might reduce by 25%, causing damage to buildings, roads, railway lines, airport runways and airstrips, and oil and gas pipelines. The recent expansion of the oil and gas

pipeline network in Russia has created a vulnerable situation, where poor construction in areas experiencing seasonal permafrost thaw is increasing the risk of failure and large spills. Recent analysis indicates that the stability of urban infrastructure will decline by at least 25% and potentially by up to 95% across the Russian permafrost region by 2050.

***Disease:*** In late 2016 reindeer herders in the Russian High North were exposed to anthrax released from the melting permafrost, resulting in the culling of economically important reindeer herds. There are over 500 anthrax burial points registered in Siberia and the Far East, and continual melting of permafrost is likely to expose more infected corpses, and potentially those carrying other diseases such as bubonic plague and smallpox.

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Archipelago, favouring an increase in Russian activity in the Arctic by 2050.

**Trade routes:** As melting sea ice opens up new shipping routes between Asia and Europe, and Asia and North America, journey times and fuel costs may reduce by more than 40% whilst also reducing carbon emissions. Current journey times from Dalian in China to Rotterdam in the Netherlands are 48 days via the Suez Canal but only 38 days via the Northern Sea Route and this difference may widen in future decades. Out to 2050, reducing sea ice cover may mean that the Northwest Passage and the Northern Sea Route could be used without passing through the exclusive economic zones of Canada and Russia facilitating cheaper and less restricted access for international traffic.

**Resources:** Investment from Arctic mining companies will continue out to 2050, with prospecting taking place for a range of materials across all Arctic states. To date this has taken place with much less publicity than oil and gas exploration, but levels of activity are likely to increase out to 2050. In 2010, 36.8% of Alaska's foreign (non-US) export earnings came from exports of zinc, lead, gold and copper, generating \$1.3bn. In Canada, mining accounts for half the income of the North-West Territories. Given the projected increase in global energy demand out to 2050, new sources of oil and gas are likely to be required including those in the High North. The centre of investment is predicted to be in in the Barents Sea area, north of Norway and Russia, and in northern Alaska. Smaller investments, but with major local and international consequences, could also occur in Greenland, Canada and elsewhere in the Arctic. Out to 2050 Arctic waters are expected to become increasingly important fishing grounds. Potential catches of North Atlantic fish are projected to increase by roughly 30%, while new fishing grounds are expected to emerge, possibly in international waters not covered by regional fisheries management organisations.



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Increased activity in the region will create new threats – and Arctic stakeholders will be keen to boost their presence in the region to protect their interests. It is highly probable that out to 2050 the High North will see further investment in surveillance, patrolling and security infrastructure, and an increasingly militarised High North, particularly in the Russian Arctic, remains likely.

***Demographics:*** The population inside the Arctic Circle currently stands at around four million, a figure which has remained broadly stable since 2000 and is likely to remain stable out to 2050. There will, however, be changes to the demographic composition as population levels rise in the Arctic territory of some



states and decline in others. In particular, numbers have grown in Alaska, Canada, Iceland, and Norway, with Nunavut in Northern Canada experiencing a 20% increase since 2000, whilst declining in northern Scandinavia and most noticeably in the Russian High North. Population change has been caused in large part by economic decline (leading emigration) in the case of post-Soviet Russia, inward migration in the case of Alaska and increases in fertility in areas such as Canada and Greenland, resulting in a younger population in these territories. For the Russian Arctic in particular, immigration will be essential if the decline in the working age population is to be prevented. The population of Russia is projected to reduce by up to a million potential workers per year out to 2050, causing a skills shortage which could fundamentally affect the country's ability to expand its economic activities in the region. Immigration is contributing to population growth in urban Alaska. In 2013 nearly 10% of the state was foreign-born, with the Philippines, Korea, and Thailand as major source countries, and between 2010 and 2014 the foreign-born population increased by 19.4% compared to a 5.8% increase in the United States as a whole over the same period. Although immigrants are likely to boost the Alaskan economy, their integration may prove a challenge out to 2050.

***Employment opportunities:*** Potential oil, gas and mining activity may generate well paid job opportunities out to 2050, but the High North's relatively small population and its limited technical skills means that large and complex industrial projects will depend on attracting sufficient numbers of migrant workers to the region. This may result in a two-tier society divided into those who can access skilled jobs and those who cannot, leading to tensions between indigenous and immigrant populations. Automation may go some way in mitigating the skills shortage out to 2050, but it will not address the need to provide high quality jobs for the indigenous peoples.

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# Questions



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