SFA WS Agenda

08:40-08:50	**Administrative Remarks** *CDR David Sherriff, Strategic Analyst, Strategic Analysis Branch, ACT*
08:50-09:00	**Welcome and Introductory Remarks** *COL Tibor SZABO, Branch Head, Strategic Analysis Branch, ACT*
09:00-09:45	**Framework for Future Alliance Operations 2018 Report** *LTC Aaron BAZIN, Strategic Analyst, FFAO Team Leader, ACT*
09:45-10:30	**SFA 2017 Report, Aim and expected deliverables of the workshop and the way ahead** *Mr. Mehmet KINACI, Strategic Analyst, SFA team Leader, ACT*
10:30-10:45	**Coffee Break** *Coffee and pastry provided*
10:45-12:00	**Plenary Session – Best Practices on Methodology** - *UK DCDC, German Planning Office, US Joint Staff,*
12:00-13:15	**Presentations on using computing power for data ingest, analysis and scenario building** - *IBM: Mr. Michael Perrone; 4Strat: Mr. Christian Sprengel and Ultima/Blockfinity: Mr. Mario SALAZAR*
13:15-14:30	**Lunch**
14:30-17:00	**Breakout Sessions**

Administration

- **POCs**
  - Cdr David Sherriff
  - Maj Isabel Guerra
  - Ms Verónica López Cendón (Hotel Playa Victoria)
- **Duty Phone**
  - +1 757 6758391
- **Emergency Procedure**
  - Emergency Services 112
  - Check for exits – N.B. not all rooms have their own fire doors
  - Muster in lobby if safe or follow staff instructions
  - Do not wander off
- **WiFi**
  - PLAYAVICTORIA2018
- **Registration / Badges**
  - Please make sure to register and collect your badge
- **List of attendees**
  - Contact Isabel/Dave if you do NOT wish to be listed

NATO OTAN

Supreme Allied Commander Transformation

SFA/FFAO Workshop
Cadiz, Spain

Col Tibor SZABO, HUN AF,

SA Branch Head, SPP

24-25 April 2018

Long-Term Military Transformation

Based on the trends, what is the future like?

What abilities will NATO military forces require in the future?

What capabilities will NATO military forces require in the future?

NATO Defence Planning Process

INFORMS

INFORMS

SACT 6 Focus Areas

We completed SFA/FFAO in time to inform Military Committee input to NDPP Step 1, Political Guidance as directed per PO (2015)0624, MCM-0199-2015

Supreme Allied Commander Transformation

LTC Aaron BAZIN

FFAO Team Lead

SA Branch, SPP

24-25 April 2018

Supreme Allied Commander Transformation

Mr. Mehmet KINACI
SFA Team Lead
SA Branch, SPP

24-25 April 2018

Aim, Objectives and Deliverables

The aim of the SFA Workshop is to take stock, review methodology, discuss best practices and to outline a proposed way ahead toward the development of future Reports.

- PART – 1: SFA overview, best practices and using computing power to support methodology
- PART – 2: Confluence of Technology Trends and their implications on trends/domains
- PART – 3: Regional Perspectives

Deliverables:

- Technological developments' influence on trends: baseline assessment (where we are), facts (what we know), key takeaways, projections out to 2040.
- Regional Perspectives: where we are, what we know, key takeaways, two-three scenarios and key words or phrases for computer aided analysis to identify indicators.

SFA WS Agenda – 24 April

08:40-08:50	**Administrative Remarks** *CDR David Sherriff, Strategic Analyst, Strategic Analysis Branch, ACT*
08:50-09:00	**Welcome and Introductory Remarks** *COL Tibor SZABO, Branch Head, Strategic Analysis Branch, ACT*
09:00-09:45	**Framework for Future Alliance Operations 2018 Report** *LTC Aaron BAZIN, Strategic Analyst, FFAO Team Leader, ACT*
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13:15-14:30	**Lunch**
14:30-17:00	**Breakout Sessions**

SFA WS Agenda – 25 April

08:15-08:30	**Welcome**
08:30-09:45	**Breakout Session Panel Presentation** *Wrap-up technology trends and out brief*
09:45-10:15	**Coffee Break -** *Coffee and pastry provided*
10:15-11:30	**Introduction to Regional Perspectives** *Asia-Pacific: Lt Col Ken Martin* *Arctic: Dr Katarzyna Zysk, Institute for Defence Studies, Oslo, Norway* *Russia and Eastern Europe: Dr. Flemming Splidsboel Hansen* *MENA: Lt Col Pierre Asencio*
11:30-13:30	**Breakout Sessions on Regional Perspectives** *Discussions on Regional Perspectives* *Preparation for out-brief panel presentation*
13:30-14:45	**Lunch**
14:45-16:00	**Breakout Session Panel Presentation** *Regional Perspectives – findings, key takeaways, potential scenarios* - *Asia-Pacific* - *Arctic* - *Russia and Eastern Europe* - *The Middle East and North Africa & Sahel*
16:00-16:15	**Closing Remarks** *COL Tibor SZABO, Branch Head, Strategic Analysis Branch, ACT*
16:20-17:00	**SME, Moderator, Facilitator meeting**

Part - 1

SFA overview, best practices and using computing power to support methodology

What's New?

SFA 2013 and SFA 2017 Reports - A comparison

- **SFA 2013 Report: 5 Themes, 15 Trends and 34 Implications**
- **Provided a more optimistic view of the future –**
  - ***potential for major/interstate conflict is less likely***
  - ***the progress of democracy especially in the MENA***
- ***Decreasing Defence Expenditures* was defined as a trend**
- **Avoided naming *potential adversaries***

- **SFA 2017 Report: 5 Themes, 20 Trends and 59 Implications**
- **Changes to the security environment demanded a more pessimistic view with *increased potential for interstate conflict*, *growing terrorist threat, polarization and regionalization* while highlighting opportunities.**
- ***A change* in the direction of the *defence expenditures trend* has been observed**
- **# of trends/implications to cover areas that were not included in the previous versions – i.e. Technology Theme is almost doubled in size from 3/7 to 5/13**
- **Includes areas such as, *Increasing role of Non-state Actors, Challenges to Governance, Protection of Civilians, Projecting Stability, Defence and Deterrence, Nationalism and Polarization, WMD***
- **Alternative view(s) are provided when trends have divergent trajectories – *Globalization, Polarization, AI and Autonomous Systems, the Future of China, Potential for Major State Conflict***

SFA Themes & Trends

- Re-distribution of Geostrategic Power
- **Use of Power Politics**
- **Non-State Actor Influence in Domestic/International Affairs**
- Challenges to Governance
- **Public Discontent/Disaffection and Polarization**

- Rate of Technology Advance
- Access to Technology
- Global Network Development
- **Commercial Sector Dominance**
- **Technological Dependencies**

- Globalization of Financial Resources
- **Geopolitical Dimension of Resources**
- Defence Expenditures Challenges in the West
- **Increased Inequality**

- Asymmetric Demographics Change
- Increasing Urbanization
- Fractured Polarized Societies
- Increasingly Connected Human Networks

- Environmental/ Climate Change
- Natural Disasters

SFA Trends & Implications (Example)

Re-distribution of Geostrategic Power

- Challenges to the rule-based order
- Euro-Atlantic relations and Alliance cohesion challenged
- Increased requirement for cooperation with other actors including rising powers

Use of Power Politics

- Increased potential for confrontation and conflict
- Nationalism and divergent risk and threat perception
- Requirement for a robust and credible defence and deterrence

SFA informs and sets the intellectual foundation of the FFAO

SFA Methodology

Synthesis of NATO & National Studies

Gap/Trend Analysis Workshops in Lucerne & Bydgoszcz

Continuous assessment of existing and emerging trends
Collaboration with Nations
Cross-functional coordination at ACT
Coordination with NATO HQ, ACO and COEs

Gap/Trend Analysis & interaction with Nations and Think Tanks- 2016

SFA Workshops - 2016

Lucerne: 21 NATO, 5 Partner Nations, NATO HQ, NCS, Agencies, 16 COEs, industry and academia.

Bydgoszcz: 21 NATO, 3 Partner Nations, NATO HQ, NCS, Agencies, 16 COEs, industry and academia.

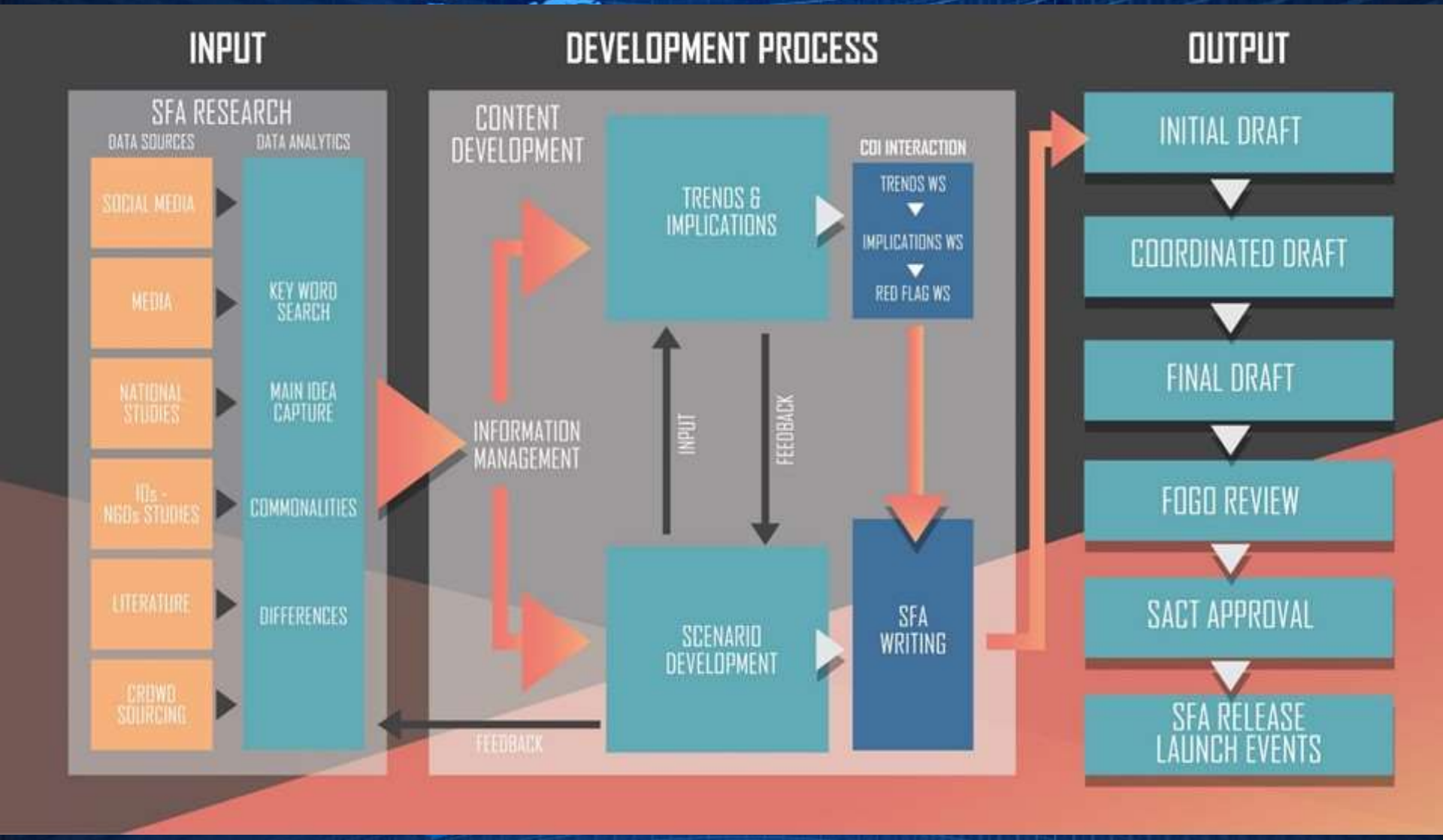
SFA 2017 Report **Initial Draft** circulated to HQ SACT in Dec 2016

SFA 2017 Report **Coordinated Draft** circulated to NATO/Partner Nations and HQ NATO/Commands in Feb- May 2017

SFA 2017 Report **Final Draft** circulated to Nations in Jun 2017

UK MOD DCDC "Red Team" Analysis (April 2017) to refine the inherent logic and conciseness of the findings of the SFA 2017 Report

SFA Methodology – They Way Ahead



Part - 2

Confluence of Technology Trends and their implications on other trends/domains

Deliverable:

- Technological developments' influence on trends: baseline assessment (where we are), facts (what we know), key takeaways

SME/Moderator for Breakout Sessions

PART: 1 – Confluence of Technology Trends and their influence on trends in other domains					
Theme	Political	Human	Technology	Economic/Resources	Environment
SMEs	Dr. Quentin Ladetto	Mr. Jeff Becker	Mr. Gabriele Rizzo	Dr. Adrian Kendry	Mr. Mark Tocher
HQ NATO	Mr Gabriele Cascone		Ms. Jackie Eaton (Lead/SME)		
ACT/ SA	Mr. Mehmet Kinaci LTC Aaron Bazin Maj Aparicio	COL Sven Szabo LTC Pierre Asencio CDR Rob Sinram Mr. Jeff Reynolds	CDR Jean-Luc Devillers COL Tibor Szabo	LTC Richard Pleijsant Maj Isabel Guerra	CDR David Sherriff LTC Fleming Jensen Dr. Katarzyna Zysk
Navy Reservists	Michael Braswell	Richard Carroll	Tiffany Stuflick Katrina Butler	Timothy Tuck	Tony Garcia

PART: 2 – Regional Perspectives				
Region	Russia-Eastern Europe	Asia - Pacific	Arctic	Middle East and North Africa and Sahel
SMEs	Dr. Flemming Splidsboel Hansen	Mr. Jeff Becker	Dr. Katarzyna Zysk	LTC Pierre Asencio
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Navy Reservists	Michael Braswell Tony Garcia	Richard Carroll	Timothy Tuck Tiffany Stuflick	Katrina Butler

Part – 2: Breakout Sessions - Technology

PART: 2 – Confluence of Technology Trends and their influence on trends in other domains					
Theme	Political	Human	Technology	Economic/Resources	Environment
SMEs	Dr. Quentin Ladetto	Jeff Becker	Ms. Jackie Eaton Gabriele Rizzo	Dr. Adrian Kendry	Mark Tocher
ACT/ SA	Mehmet Kinaci Dr. Aaron Bazin Eduardo Aparicio	Sven Szabo Pierre Asencio Rob Sinram Jeff Reynolds	Jean-Luc Devillers Tibor Szabo	Richard Pleijsant Isabel Guerra	David Sherriff Fleming Jensen Dr. Katarzyna Zysk
Navy Reservists	Michael Braswell	Richard Carroll	Tiffany Stuflick Katrina Butler	Timothy Tuck	Tony Garcia
Participants	Kristian Knus Larsen Carlos Martinez Wagn Christensen Lars-Ove Roos Petr Pargac Gheorge C. Bogdan Janos Szonyegi Frank Ch. Sprengel Staffan Sjoberg Carsten Schlueter Johann Jamnig Katarzyna Zysk Jyri Saanio Krasimir Parashkevov Haldun Kocak Gabriele Cascone Nikolay Kotsev Olaf Theiler	Klaudia V. Lengyel Timothy Dreifke Roberto Mastrotto Richard Carroll Fabian Baxa Martina Podvrsnik Marcel Kerstens Herve Le Guyader Lucian Munteanu Gitanjali Adlakha-Hutcheon Daniele Piperno Bayardo Abos Leopold Schmertzing	Richard Kastelein Joel Mozer Ruud Schoonen Jaromir Mikulenka Bertrand Bara Joachim Klerx Fabio Corona Bharatkumar Patel Ken Martin Christian Greyfie de Bellecombe Goran Kindvall Sven Mastbooms David Smith Rolf Rasmussen Michael Perrone Vojtech Fucek Miroslaw Skowronski Aleksander Leoniak	Olivier Schneider Andrzej Kubisiak Alberto Zamboni Elisio Perez Gomez Bryn Richards Arturas Petkus Louise Hoehl Geir Arne Hestvik Thierry Vautrin Fernando Pedreira Steven Rose Orlin Gergov	Bart Linsen Marten Meijer Shannon Wells Gabor Czirfusz Andrea Rulli Daniele Paradiso Grzegorz Adamczyk Jan van der Veer Darryn Gray Gyula Bene Malin Severin Diego Martinez Canavate

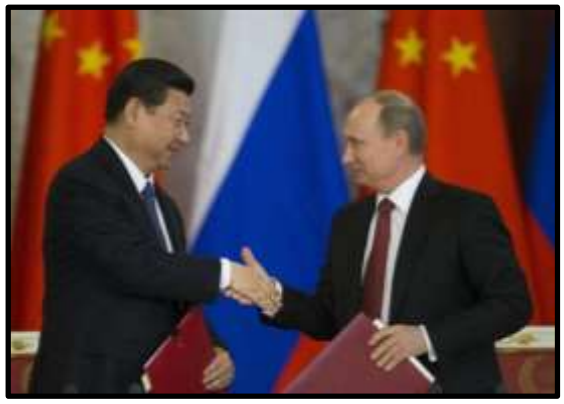
Breakout Sessions

Redistribution of Geostrategic Power

Where we are: (Our baseline assessment)

- Strategic rivalry between great powers will affect global leadership and impact strategic space for smaller nations.
- International rules and norms today provide more predictability and a more level playing field, both of which are particularly beneficial to small states.
- Polarization has increased global instability and the potential for conflict.

What we know: (Facts)



- Putin - the control of artificial intelligence will be crucial to global power – “Whoever leads in artificial intelligence will rule the world.”
- China aims to become "the world's primary AI innovation center". President Xi Jinping said he will be “promoting the deep integration of the Internet, big data, and artificial intelligence with the real economy.”
- The U.S. is still seen as a global tech leader, but in the last three to five years, that competition tilted toward China.
- Artificial intelligence: the European Commission has started work on marrying cutting-edge technology and ethical standards.

Redistribution of Geostrategic Power

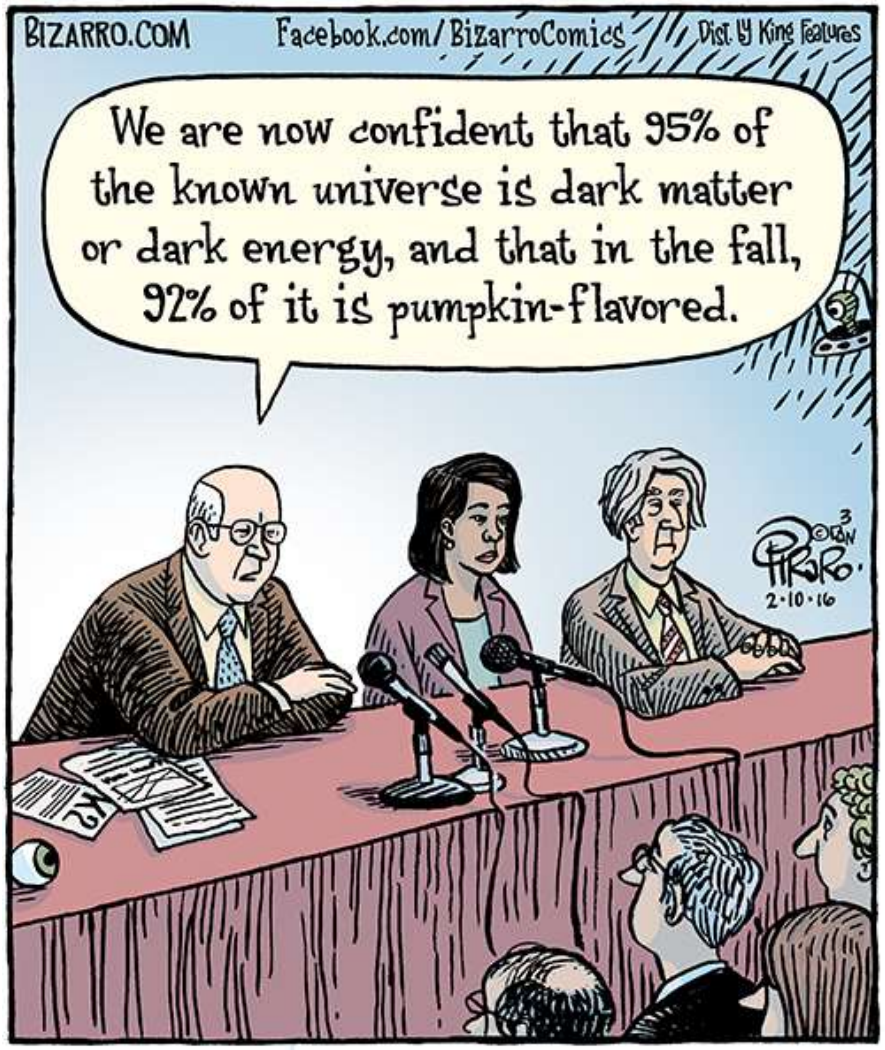
What we don't know: (Our Questions)

- How might the US-China race over global technology leadership evolve?
- How will middle powers use technology to expand their regional influence?
- How will Russia use technology to address its current challenges?
- How will the EU approach the global race for technology? What would be the role of norms, laws and ethics in the EU's response to the rapid pace of change?
- How will future technological developments determine relationships between great powers?
- How will technology will affect the new global order?

What are the projections out to 2040 (Key Takeaways and Implications):

Work Shop Outbriefs

- Two Plenary Out brief Sessions
  - ***Technology***
  - Regional Perspectives
- SME/Moderators
- Outcome of breakout sessions
- Potential scenarios, key words and/or phrases



Technology Influence on Political Trends

The Re-distribution of Geostrategic Power:

1. Where we are and what we know:

- China will continue invest in A.I., Bioengineering, nano-engineering, quantum technologies, and likely to deny West access to its technologies.
- Western countries are more restricted legally and ethically in development of A.I. and other technologies.
- GAFA's influence on global power distribution is likely to increase.
- Development of advanced weaponry by Russia will affect the balance of power.
- Democratization of technologies, non-state actors can gain partial advanced over state actors.

2. Key Takeaways – projections out to 2040:

- NATO Nations should continue to increase situational awareness predictive technologies.
- Competition to maintain the technological edge will be more fierce and is expected to continue out to 2040 and beyond, increasing potential for conflict.

3. Implications:

- Technological developments will change the NATO projects power.
- West's ability to uphold its regulations against the pace of technology development will be a challenge.

Technology Influence on Political Trends

The Public Discontent and Polarization:

1. Where we are and what we know:

- Technology is neutral. How will it be used matters?
- Regulation of technology use will determine whether it is going to increase polarization.
- Access to technology will increase generational divide.
- Technology could lead to public discontent and fractured societies however it could ease public discontent by enabling public services for public benefit.
- Technology may have unexpected second and third order effects such as unemployment that may lead to an increase in polarization.
- Social media will reduce trust between governments/institutions and the people.

2. Key Takeaways – projections out to 2040:

- Technology may lead to unequal participation on education, politics, wealth, employment, social security may result in a winner takes all result.
- Technology regulation needs to keep up with the pace of technological development.

3. Implications:

- Decision-makers need to identify how much regulation is required.
- Technology allows fragmentation of societies.

Technology Influence on Political Trends

Challenges to Governance:

1. Where we are and what we know:

- China is duplicating global governance structures and setting their own rules especially in economic structures.
- Political global governance structures are also being questioned by western countries such as U.S. support to U.N. or UNHCR.
- Overestimation of global political governance structures, higher expectations than they are capable of delivering.
- China/Russia relations depends on their relations with the U.S. and EU.
- Russia could use technology to address its challenges in different areas and use as a deterrent.

2. Key Takeaways – projections out to 2040:

- Decentralized technology could help development in Africa and MENA.
- Technology should fit into social, cultural context and existing infrastructure in the developing countries.
- Technology may not provide significant difference in projecting stability however it has the potential to empower individuals and improves democratic institutions.

3. Implications:

- Technology will make political structures more fragile initially however they may become more robust due to accountability.
- National defense industries/European defence industry will be challenged due to lack of information sharing.

(Example – Technology Influence on Political Trends)

Non-state actors influencing domestic and international affairs:

1. Where we are and what we know:

- Private security actors role in providing security is likely to increase.
- Terrorists and non-beneign state actors will benefit will benefit from the proliferation of advanced technologies including WMB, bio/nanotechnologies, machine learning, A.I., etc.
- The requirement for the protection of civilians in war zones will increase.
- In a European conflict, states may not outsource security to PMSCs as they will be less of a concern.
- The future of global organized crime will present more challenges as use advanced technology and crypto-communications.

2. Key Takeaways – projections out to 2040:

- NATO needs to increase and improve cooperation with IOs and NGOs in certain areas not explicitly military technology facilitate interaction.
- Non-state actors are constantly morphing through decentralized technology development and communication.
- Governments role will decrease and shift to non-state actors and states may lose monopoly over the use of force.

3. Implications:

- Lone wolf attacks using advanced technology may increase and impacts could reach catastrophic level.
- NATO needs to identify NGOs whether they are friendly or have malicious intent.
- Governments ability to control/work together with NGOs will be challenged as NGOs become more agile and smaller.

Part - 3

Regional Perspectives

Deliverable:

- Where we are, what we know, key takeaways, two-three scenarios and key words or phrases for computer aided analysis to identify indicators.

SME/Moderator for Breakout Sessions

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Part 3: Breakout Sessions Regional Perspectives

PART: 3 – Regional Perspectives					
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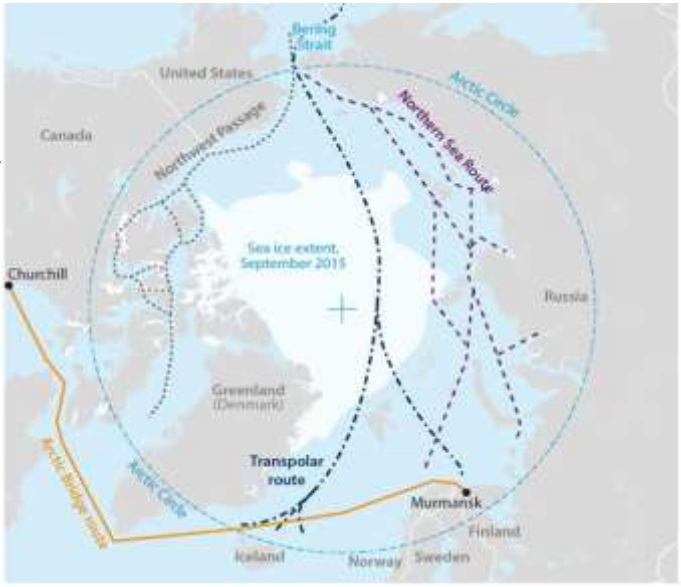
Breakout Sessions

Arctic

Where we are: (Our baseline assessment)

- The Ukrainian crisis and illegal annexation of Crimea have wrought tension between Russia and its Arctic neighbours casting a shadow over Arctic affairs.
- The 2014 IPCC report stated with very high confidence that the Arctic will continue to warm more rapidly than the global averages.
- There is a growing and legitimate concern that the current era of high political stability in the Arctic may be lost.



What we know: (Facts)

- Putin describes the Arctic as an area where the military, political, economic, technological, environmental and resource aspects of Russia's national security converge.
- China: We are a 'Near-Arctic State' and we want a 'Polar Silk Road'.
- The geostrategic importance of the Arctic in world politics and the global economy is increasing.
- The region contains 13% of the world's undiscovered conventional oil and 30% of its undiscovered conventional natural gas, according to estimates by the US Geological Survey, as well as mineral deposits.

Arctic

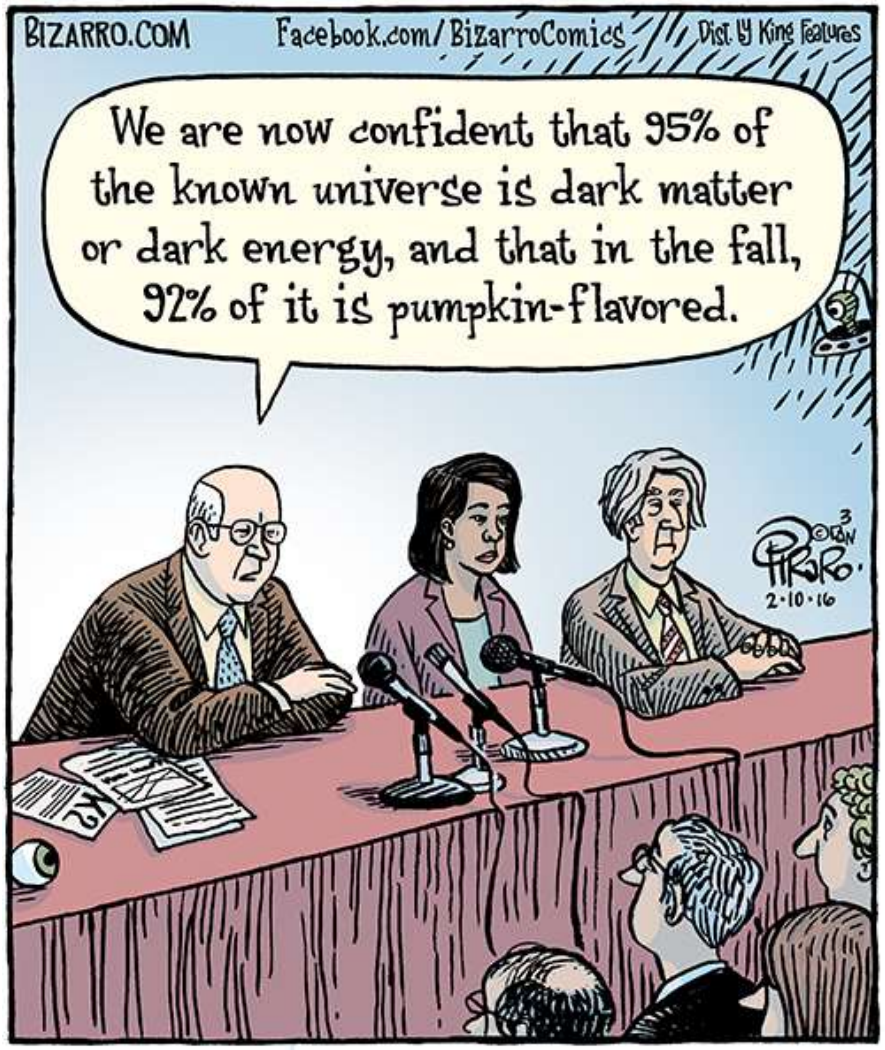
What we don't know: (Our Questions)

- Is the Arctic going to be the next South China Sea with competing territorial claims constantly threatening to devolve into armed conflict?
- Who will determine policy for the region?
- Will Arctic resources be cost-effective for extraction?
- What will be the impacts of renewable energy and electric vehicles on the price of oil and natural gas?
- With a decreased competition for resources, will there be less incentive to turn the Arctic into an arena for state conflict by 2040?

What are the projections out to 2040 (Key Takeaways and Implications):

Work Shop Outbriefs

- Two Plenary Outbrief Sessions
  - Technology
  - ***Regional Perspectives***
- SME/Moderators
- Outcome of breakout sessions
- Potential scenarios, key words and/or phrases



(Example – Regional Perspectives -Arctic)

The Arctic:

1. Where we are and what we know:

- At the current rate of ice decline, it will become economically feasible to set up extraction operations in the Arctic by around 2040.
- Arctic concerns are currently managed by rules under the UNCLOS and the Arctic Council.
- China calls itself an “Arctic stakeholder” and a “near Arctic state” and will push to have governing influence in the Arctic.
- The melting of the Arctic icecap and water temperature change are also uncovering some of the world’s richest fishing stocks, and are likely to have an impact on the existing distribution and abundance of commercial fisheries in the Arctic.
- Although the Arctic remains stable, Reports suggest a ‘scramble’ for the Arctic, increasing potential for emerging conflicts and a race for natural resources.

2. Key Takeaways:

- Due to both the warming climate in the Arctic and the re-emergence of geopolitical competition in the region, the Arctic is once again of profound importance to NATO security.
- The re-emergence of the Arctic on the international agenda and possible spill-over of tension between Russia and NATO Allies, as well as China’s increasing engagement, could make the Arctic an arena for strategic rivalry.

3. Implications:

- NATO needs to ensure a comprehensive situational awareness in the North Atlantic and the adjacent Arctic region, where Russia is building new or upgrading existing military infrastructure.
- NATO may need outside expertise and partnerships to understand the impacts of climate change and develop a comprehensive assessment of the Arctic.

(Example – Regional Perspectives -Arctic)

The Arctic:

4. Scenarios:

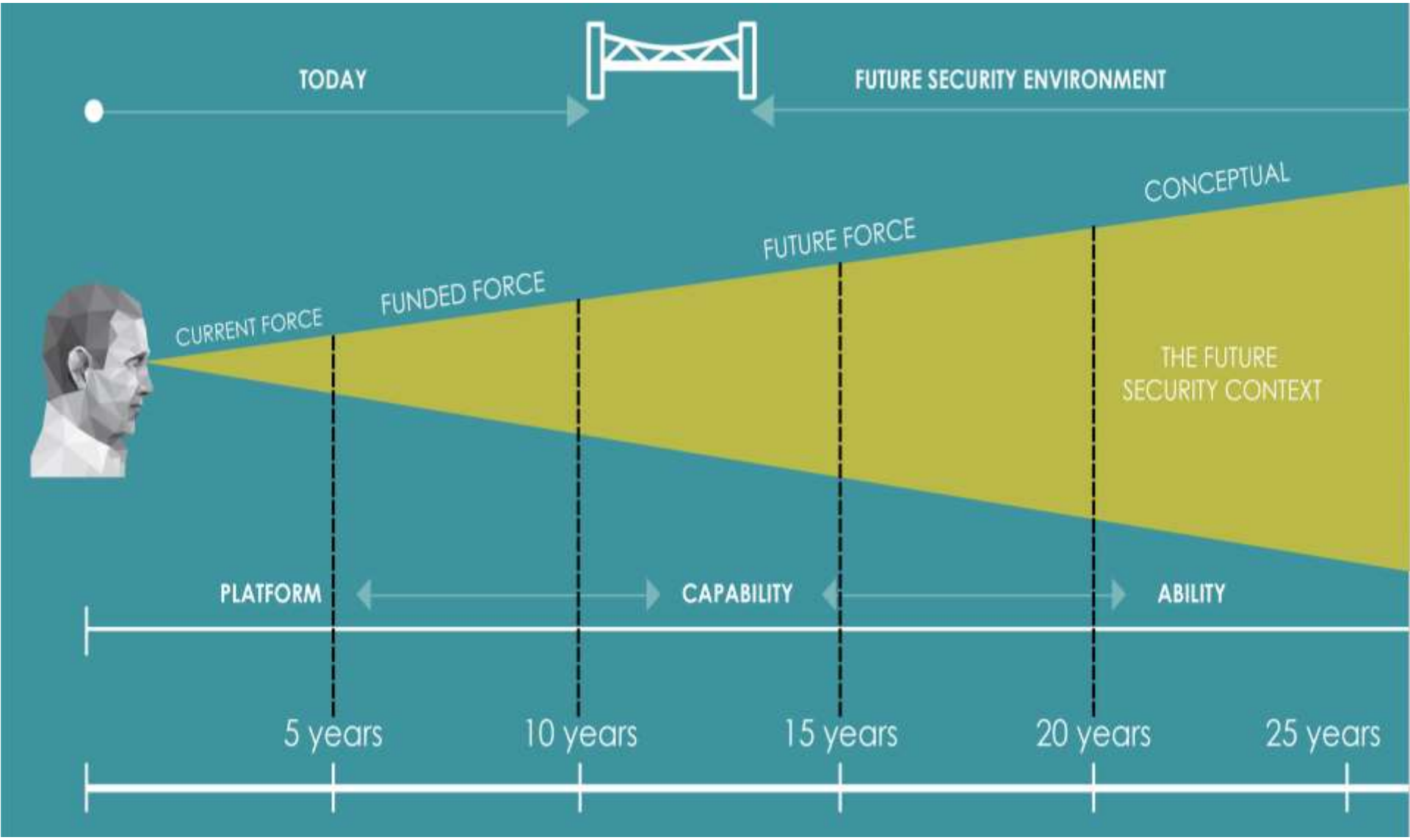
- China builds artificial island close to …….
- Russia initiated exploration of the Arctic region …..

5. Key Words, Phrases:

- High North, Climate Change, Arctic, China, Russia, icebreaker, Canada, USA, Norway, Denmark, Finland, Arctic Council etc.
- One-belt one road, Arctic fisheries, Natural Gas, Oil, Minerals, shipping routes

Back-up Slides

Understanding Future Security Environment (FSE)



The Problem Statement (Why)

Determine how NATO should transform to continue to

- ***accomplish its core tasks, (Collective Defence, Crisis Management, Cooperative Security)***
- ***address the full range of security challenges,***
- ***establish and apply a unifying vision, and***
- ***advance a conceptual framework***
- ***for forces and capabilities required to succeed beyond the mid-term planning horizon.***

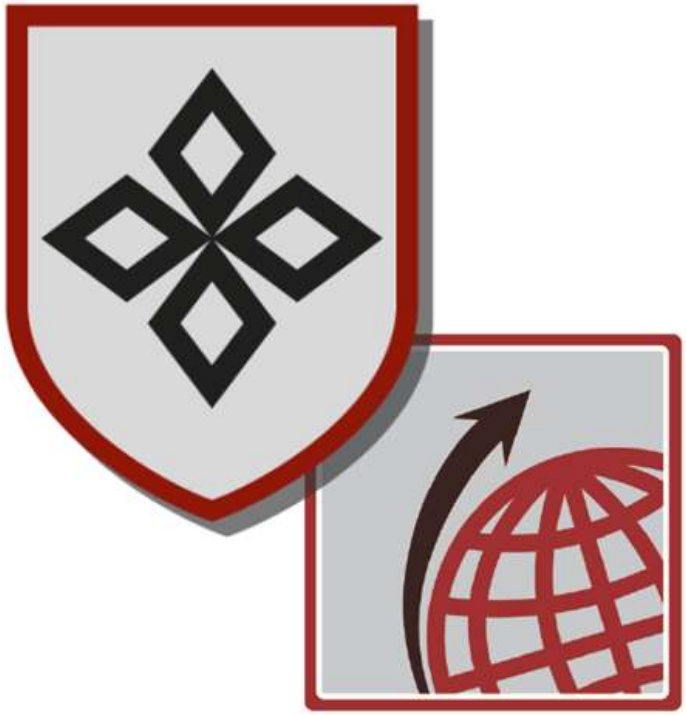
Aim, Objectives and Deliverables

The aim of the SFA Workshop is to take stock, review methodology, discuss best practices and to outline a proposed way ahead toward development of future Reports.

- Including computing power (deep learning, big data analytics and to some extent artificial intelligence) in the development of the next iteration of the SFA Report.
- Improve understanding of how confluence of technology trends will affect each other as well as other trends in different areas such as political, human, economy/recources and environment.
- In-depth analysis of the regions through regional perspectives in areas, such as the Asia-Pacific region, the Arctic, Russia-Eastern Europe, Middle East and North Africa & Sahel.

Deliverables:

- Inputs on trends where we are, what we know, what we don't know and potential projections towards 2040.
- Potential scenarios and key words or phrases for search to identify indicators in development of these scenarios.



“Scenariowork in and for the German Armed Forces”

“Methodology and Practice
of the
Future Analysis Branch,
BODP

Dr. Olaf Theiler

Content

1) Futures Work for Armed Forces:
Time for a Paradigm Shift

2) Working with multiple Futures:
Scenario-thinking and -writing

3) Translating Future into Practice:
Recent and Current Projects

No Predictions – But Many Possibilities

Probability vs. Contingency

„In History, Military and Politics have repeatedly bought the wrong equipment.

Again and again, this equipment had to be adapted to the real missions by spending lots of money. This is less than perfect and needs to change, …“

Christian Mölling, Die Rückkehr des Militärischen. In: Süddeutsche Zeitung, 24. Januar 2016, 18:47 Uhr http://www.sueddeutsche.de/politik/aussenansicht-die-rueckkehr-des-militaerischen-1.2832016

Paradigm shift
from Probability to Possibility

Richard Danzig: Driving in the Dark

Decisionmakers „will always drive in the dark.

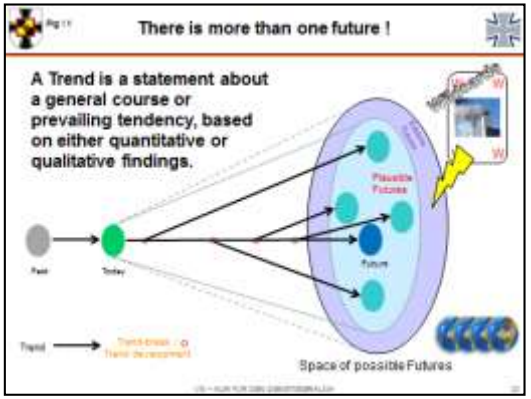
However, they must stop pretending that they can see the road.

A much better course is to adopt techniques to compensate for unpredictable conditions…“.

Richard Danzig: Driving in the Dark: Ten Propositions about Prediction and National Security, Center for New American Security, October 2011. https://s3.amazonaws.com/files.cnas.org/documents/CNAS_Prediction_Danzig.pdf

Three Pillars of Force Planning

Ad hoc Adaptation	2020 - 2030 New Strategic Concepts	2040+ Foresight Informed



Content

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Multiple Futures

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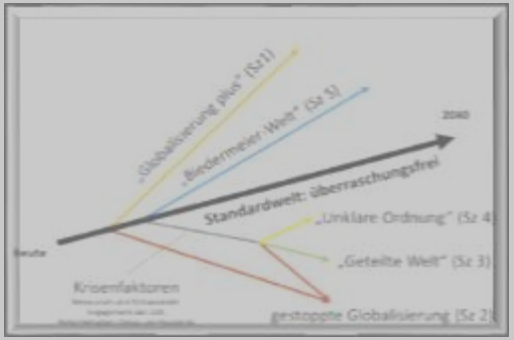
Recent and Current Projects



Core Methodology of Strategic Foresight

Trendanalysis

Scenario-analysis

Looking forward to tomorrow

Looking back to tomorrow

Monitoring

- Decision points
- Indicators
- weak signals
- Trends
- Disruption Potential

Current state of play

2018

Trend A1

Trend A2

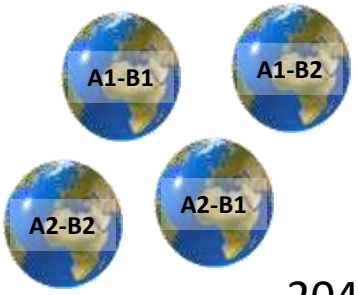
Trend B1

Trend B2

acting in accordance to the gained knowledge

Strategic Action

Scenarios: images of plausible futures „the day after tomorrow“



2045

Scenario Definition

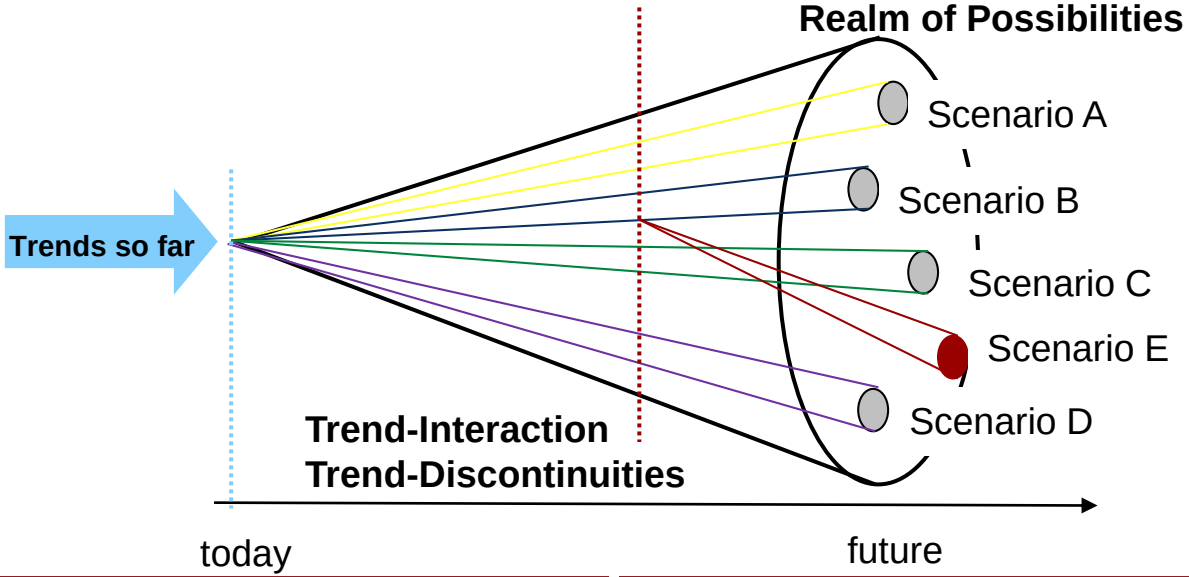
What can scenarios deliver?

- they mirror existing expectations.
- they highlight uncertainties and decisive points.
- they contribute to clarity in thinking about the future.
- they are a venue where to "think out of the box".

Definition

A scenario

- is a representation of a possible future situation (i.e. *image of the future*)
- includes developments leading to a possible future situation



HOWEVER:

- **we do not consider scenarios to be predictions.**
- **future will not look exactly like any scenario.**

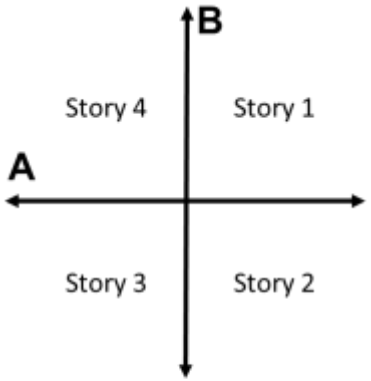
Scenario Typology

Purpose	Scenario-Type	Methodology

Scenario Construction

Scenariothinking

- Herman Kahn: Thinking the Unthinkable!



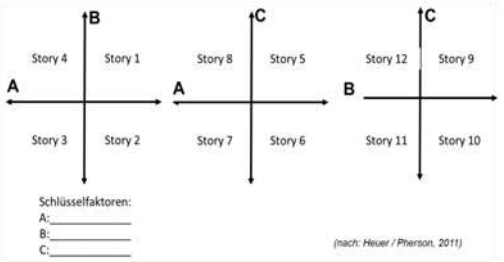
Key factors:

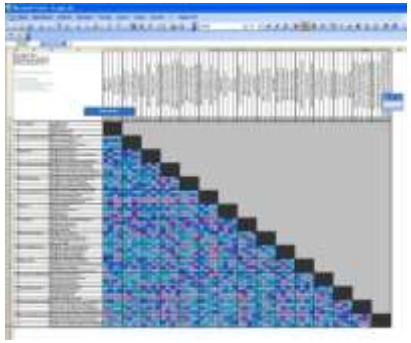
A:_____

B:_____

Alternative or multiple scenarioconstruction

Scenariocross method (2 to 3 Key factors)

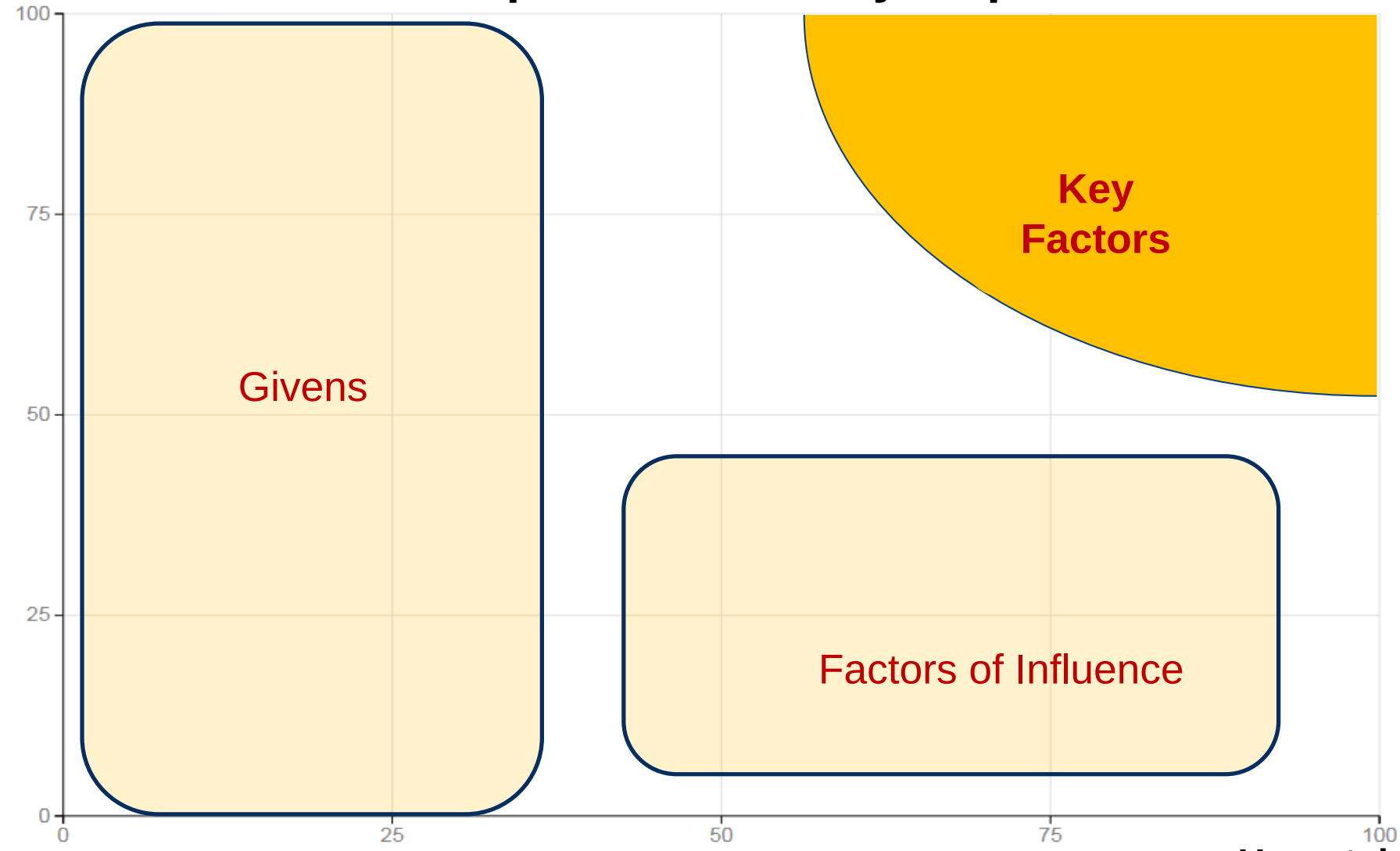




Scenarioconstruction by calculation of consistency

- Consistency and Cluster Analysis

Impact-Uncertainty-Map



F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12

Wild Cards / Black Swans (+ Flamingos + Ostriches)

Definition

Event or development that is considered

- unlikely/ unexpetced
- massively impactful towards an object of analysis
- Potential to change perspectives

Comments

- „A blind spot within our future expectations“ (Steinmüller)
- **eventful discontinuity**
- developments we do not count on
- events that alter our pattern of thought
- Need „Out of the box“-Thinking

11 September 2001

Ukraine/Crimean 2014

Content

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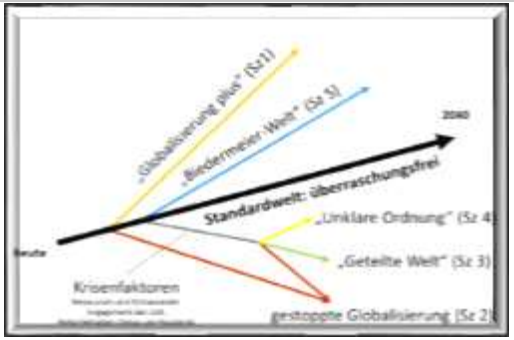


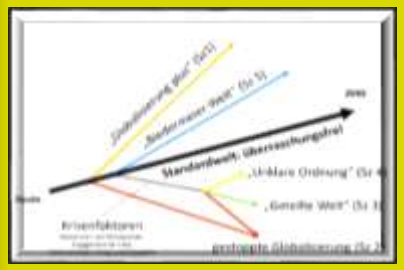
Supporting Future Capability Development

Capability Development

Implications for further research and development

Social
Technology
Economy
Environment
Politics
+
Military
+
Cyber

Trend Land-scape



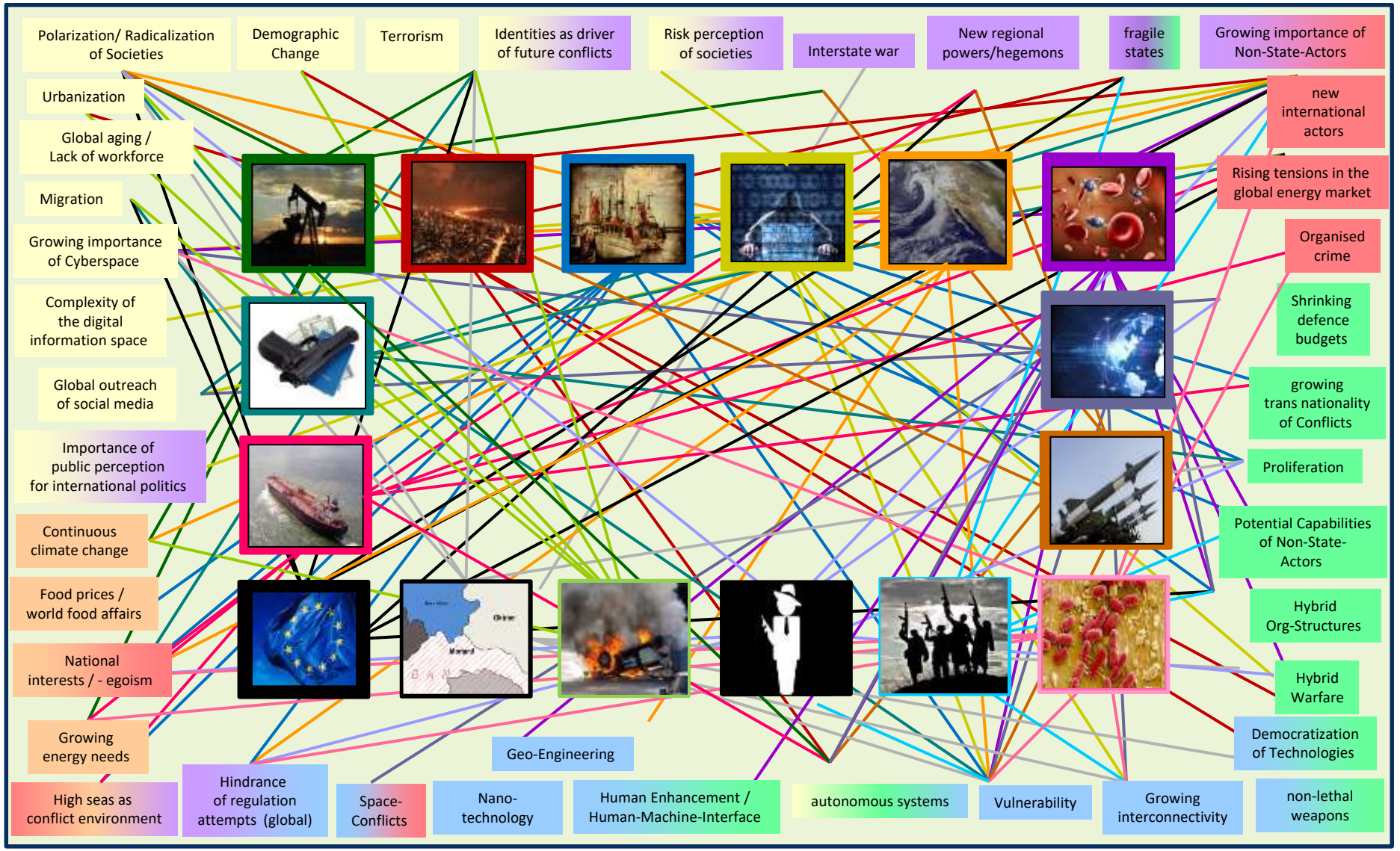
Security Environment 2040


Future Conflict Pictures



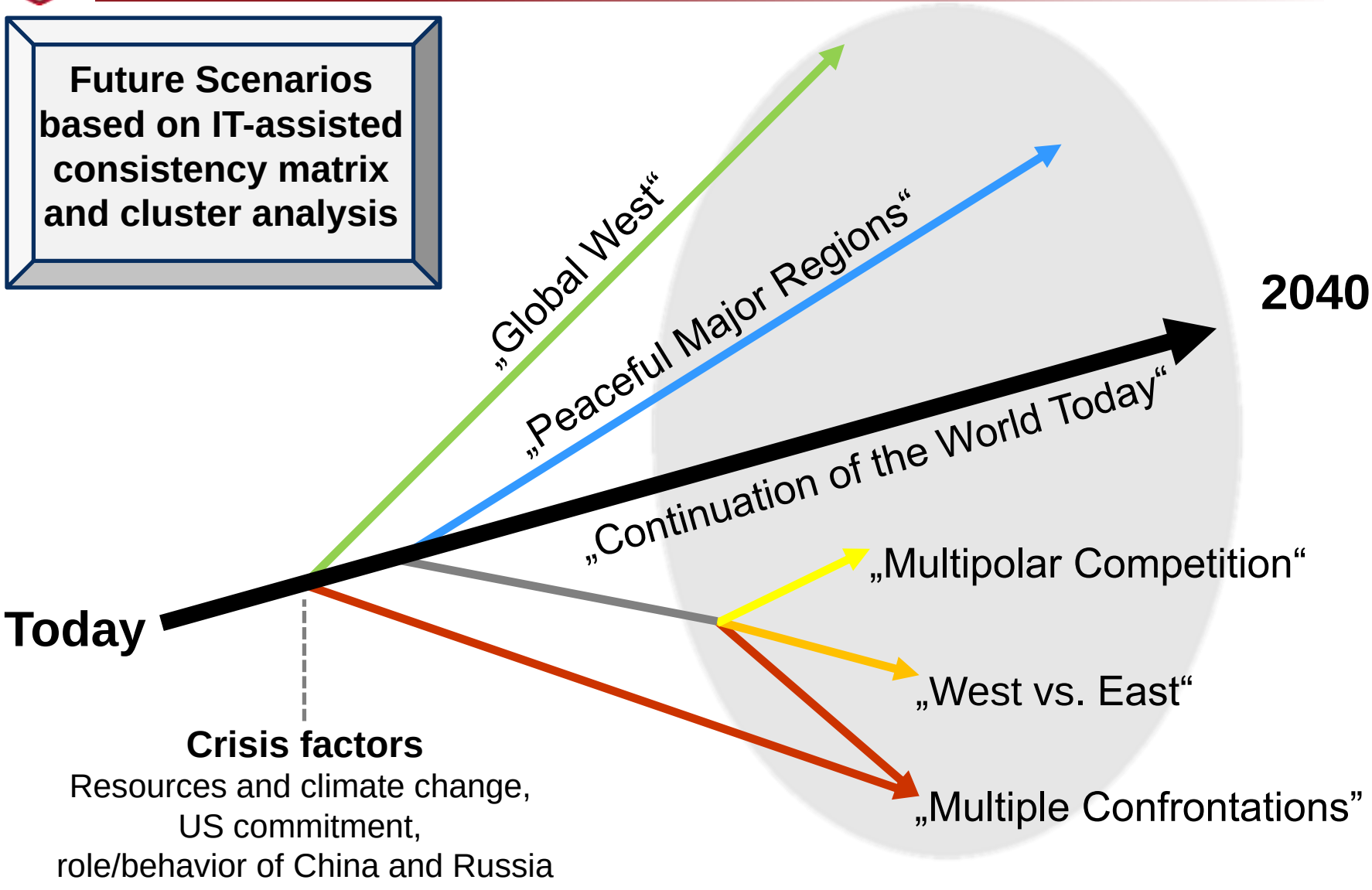

Wildcards

Relevance of Trends for Future Conflict Pictures



Future Security Environment

Future Scenarios based on IT-assisted consistency matrix and cluster analysis



The Journey is the Reward!

A FOE should help to identify future capability needs


RESTRICTED

Strategic Foresight for the Bundeswehr

A long-term perspective up to 2040

The aim of this document is to strengthen the skills and resources of strategic foresight in planning areas of the Bundeswehr. The strategic foresight method is being used for the first time in the Bundeswehr and should in future be employed on a regular basis. Strategic Foresight 2040 is thus the first product of this method and is to be a guideline for long-term objectives, innovation management, and capability development of the Bundeswehr. It does not contain stipulations or decisions. Instead it describes possible developments and capabilities.

By order

Lieutenant General

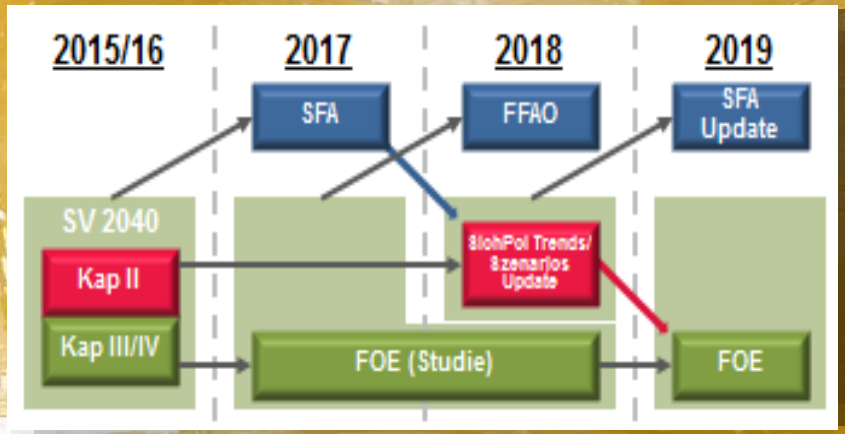
Future Topic – „Methodology for FOE-Construction“

FOE-Study

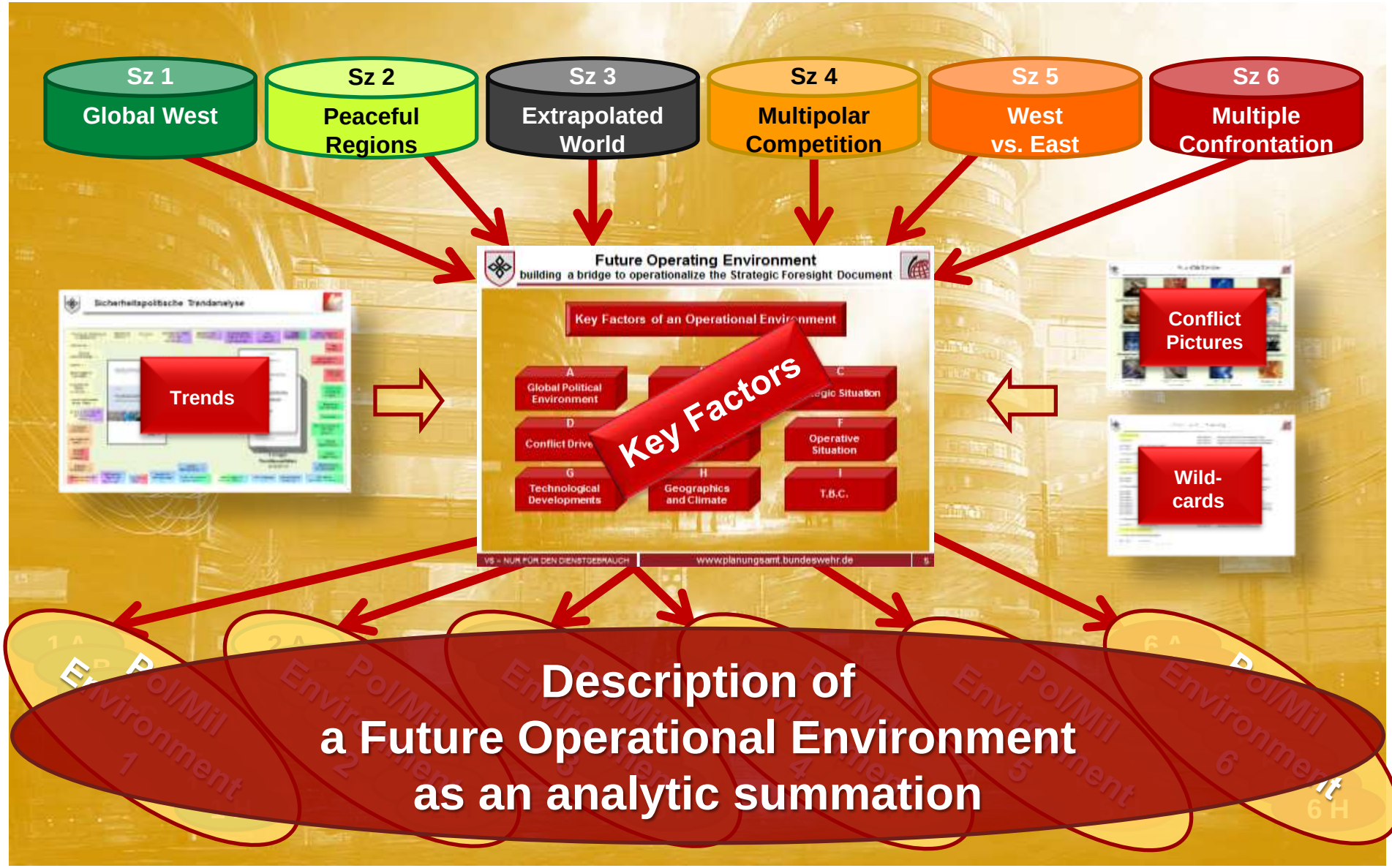
Int. Dialogue

Futures Input

Cap. Dev.



Future Operating Environment
A First Step to Operationalizing SF2040?



Key Factors in any FOE

Time:

- Growing speed of decision making,
- Faster sensor-shooter-linkage,
- Ever faster operational tempo,
- Rapid changes in operational intensity,
- Swift transition between different kinds of operations.

Space:

- Cover more space with less personnel,
- Efficiency pressure on armed forces,
- Need to bridge long distances,
- Diversity of geographical environments,
- Long distance strike capabilities.

Force:

- Demographic changes – implications for recruitment and manpower ,
- Decentralization of command & control,
- Need for agility, flexibility and assertiveness.

Cyber:

- Digitalization of the battlefield,
- Networked planning and decision making,
- Implementation of AI,
- Cybersecurity and Cyberdefence.
- Cyber-resilience of armed forces (and societies),
- EM-hardening,

Future Operating Environment – Working Method & Process Visualization

Security-Policy Environment

Level 1

Political / Military Environment

Level 2

Generic Military Scenario

Level 3

Military Vignette

Level 4

Given Background

SP XY
Sec.Pol Envir.
SV2040

Deduction based on Key Factors

Deduction 1

Pol/Mil XY
Pol/Mil Env.

Deduction based on baseline-scenarios

Deduction 2

GMS XY
Gen.Mil.
Scenario

Construction based on morphological toolbox

Deduction 3

V1 A
V1 B
V1 C
V1 D
V1 A

Testing Capabilities

Project based use

Project based use

Questions ?

SFA WS Agenda – 25 April

08:15-08:30	**Welcome**
08:30-09:45	**Breakout Session Panel Presentation** *Wrap-up technology trends and out brief*
09:45-10:15	**Coffee Break -** *Coffee and pastry provided*
10:15-11:30	**Introduction to Regional Perspectives** *Asia-Pacific: Lt Col Ken Martin* *Arctic: Dr Katarzyna Zysk, Institute for Defence Studies, Oslo, Norway* *Russia and Eastern Europe: Dr. Flemming Splidsboel Hansen* *MENA: Lt Col Pierre Asencio*
11:30-13:30	**Breakout Sessions on Regional Perspectives** *Discussions on Regional Perspectives* *Preparation for out-brief panel presentation*
13:30-14:45	**Lunch**
14:45-16:00	**Breakout Session Panel Presentation** *Regional Perspectives – findings, key takeaways, potential scenarios* - *Asia-Pacific* - *Arctic* - *Russia and Eastern Europe* - *The Middle East and North Africa & Sahel*
16:00-16:15	**Closing Remarks** *COL Tibor SZABO, Branch Head, Strategic Analysis Branch, ACT*
16:20-17:00	**SME, Moderator, Facilitator meeting**

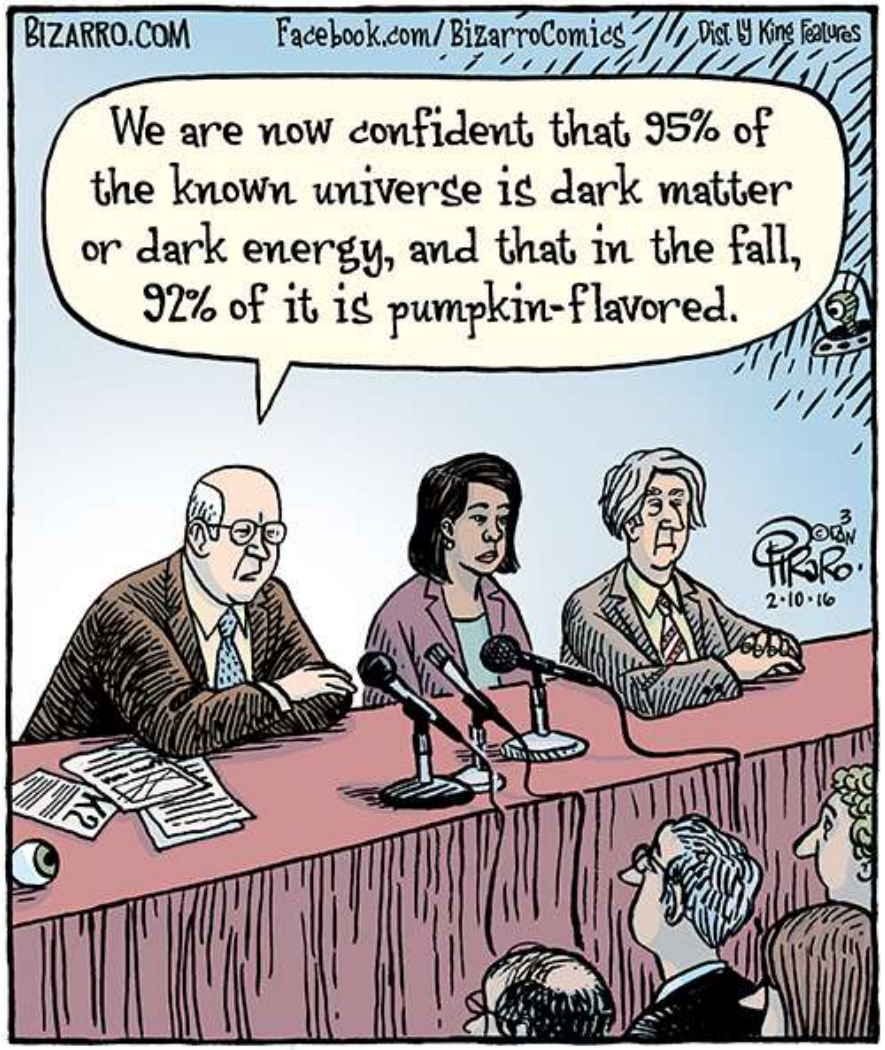
Supreme Allied Commander Transformation

Mr. Mehmet KINACI
SFA Team Lead
SA Branch, SPP

24-25 April 2018

Work Shop Outbriefs

- Two Plenary Out brief Sessions
  - ***Technologies' influence on trends***
  - Regional Perspectives
- SME/Moderators
- Outcome of breakout sessions
- Potential scenarios, key words and/or phrases



Technology Influence on Political Trends

The Re-distribution of Geostrategic Power:

1. Baseline:

- China will continue invest in A.I., bioengineering, nano-engineering, quantum technologies, and likely to deny West access to its technologies.
- Western countries are more restricted legally and ethically in development of A.I. and other technologies.
- GAFA's influence on global power distribution is likely to increase.
- Development of advanced weaponry by Russia will affect the balance of power.
- Democratization of technologies, non-state actors can gain partial advanced over state actors.

2. Key Takeaways – projections out to 2040:

- NATO Nations should continue to increase situational awareness predictive technologies.
- Competition to maintain the technological edge will be more fierce and is expected to continue out to 2040 and beyond, increasing potential for conflict.

3. Implications:

- Technological developments will change the NATO's ability to project power.
- West's ability to uphold its regulations against the pace of technology development will be a challenge.

Technology Influence on Political Trends

The Public Discontent and Polarization:

1. Baseline:

- Technology is neutral. How will it be used matters?
- Regulation of technology use will determine whether it is going to increase polarization.
- Access to technology will increase generational divide.
- Technology could lead to public discontent and fractured societies however it could ease public discontent by enabling public services for public benefit.
- Technology may have unexpected second and third order effects such as unemployment that may lead to an increase in polarization.
- Social media will reduce trust between governments/institutions and the people.

2. Key Takeaways – projections out to 2040:

- Technology may lead to unequal participation on education, politics, wealth, employment, social security may result in a winner takes all result.
- Technology regulation needs to keep up with the pace of technological development.

3. Implications:

- Decision-makers need to identify how much regulation is required.
- Technology allows fragmentation of societies.

Technology Influence on Political Trends

Challenges to Governance:

1. Baseline:

- China is duplicating global governance structures and setting their own rules especially in economic structures.
- Political global governance structures are also being questioned by western countries such as U.S. support to U.N. or UNHCR.
- Overestimation of global political governance structures, higher expectations than they are capable of delivering.
- China/Russia relations depends on their relations with the U.S. and EU.
- Russia could use technology to address its challenges in different areas and use as a deterrent.

2. Key Takeaways – projections out to 2040:

- Decentralized technology could help development in Africa and MENA.
- Technology should fit into social, cultural context and existing infrastructure in the developing countries.
- Technology may not provide significant difference in projecting stability however it has the potential to empower individuals and improves democratic institutions.

3. Implications:

- Technology will make political structures more fragile initially however they may become more robust due to accountability.
- National defense industries/European defence industry will be challenged due to lack of information sharing.

Technology Influence on Political Trends

Non-state actors influencing domestic and international affairs:

1. Baseline:

- Private security actors role in providing security is likely to increase.
- Terrorists and non-benign state actors will benefit will benefit from the proliferation of advanced technologies including WMB, bio/nanotechnologies, machine learning, A.I., etc.
- The requirement for the protection of civilians in war zones will increase.
- In a European conflict, states may not outsource security to PMSCs as they will be less of a concern.
- The future of global organized crime will present more challenges as use advanced technology and crypto-communications.

2. Key Takeaways – projections out to 2040:

- NATO needs to increase and improve cooperation with IOs and NGOs in certain areas not explicitly military technology facilitate interaction.
- Non-state actors are constantly morphing through decentralized technology development and communication.
- Governments role will decrease and shift to non-state actors and states may lose monopoly over the use of force.

3. Implications:

- Lone wolf attacks using advanced technology may increase and impacts could reach catastrophic level.
- NATO needs to identify NGOs whether they are friendly or have malicious intent.
- Governments ability to control/work together with NGOs will be challenged as NGOs become more agile and smaller.

Supreme Allied Commander Transformation

SFA/FFAO Workshop
Cadiz, Spain

Mr. Jeff Becker,

US J7

Human Lead

Human Syndicate

Asymmetric Demographic Change

1. Baseline:

- Use of CRISPR 9CAS might be widely available
- Genetic modification crops/ water purification tech expansion supporting population size?
- Increase in GDP / can it support population increase. (Power/Water)
- Life extension techniques – increase burden of support on next generation
- Can we solve problems faster than we create them?

2. Key Takeaways:

- Parallel multi-tier societies developing
- Automatization/Tech influence in work life balance + income
- Variation in how nations/ cultures/ ethical bases & income deal with tech integration

3. Implications:

- Who are going to be the first nations to use gene editing ect..?
- Tailored genetic modification causing inequality
- Is ethics and responsibility paired with technological innovation
- New form of colonialism causing wars over investments in developing countries.
- Automatization causing unemployment and loss of income to support families
- *2nd/ 3rd order consequences of rapid adoption*

Human Syndicate

Increasing Urbanization

1. Baseline:

- The “smart city” (vulnerable to cyber-attack) vs privacy
- Mega-cities with societal/economic strata –city rankings (smart/ not so smart/ feral)
- Alternate economies (bitcoin?)
- Automated transport integration
- Resource disruptors: eg. Space base solar/ vertical farming/ evap water source

2. Key Takeaways:

- Labor disruption in city
- Cities vulnerable to disruption of supplies…increasingly complex
- Being trapped in an urban area due to income disparity -supply chains
- A city has allegiance/ polarization/ identity tie to a nation or along other lines
- Is the new urban area an Achilles heel or force multiplier for military?
- Population density susceptibility to pandemic or asymmetric threats

3. Implications:

- Alternate allegiances (corporate/ NGO control of infrastructure)

Human Syndicate

Fractured and/or polarized societies

1. Baseline:

- “Digital companion” and alternate reality
- Universal language – human communication without speech

2. Key Takeaways:

- Increase in oppressive governments – digital control
- Global vs. local life – how much of the population is interconnected
- Technology enables but also hinders polarization
- Is the internet good for humanity
- The digital avatar blurring identity and causing us to lose human connection and identity
- The state was innovative – what is next in cyber domain
- Power being reorganized around new poles
- Avatar –AI –who is influencing who

3. Implications:

- Civil war
- Entertaining and keeping the masses content
- Protection of identities
- 3rd order networks vs. hierarchies/ hybrid governance/ who wins

Human Syndicate

Increasingly connected human networks

1. **Baseline:**
   - Cyber domain as primary reality (escape the real)
   - Cellular tech proliferation (panoptic on) real time recording
   - Precision targeting/shutdown of internet DOS attack
   - Social networks as an alternate intelligence realm (cyber-HUMINT) –ISR on the internet
   - Cyber great wall/ firewall
   - Human machine fusion –internet of things
   - Quick analysis and trend detection of networks
   - Representative presence – avatars-immortality

2. Key Takeaways:

- Democracy – who has ability to govern cyberspace – global competition for influence
- Translating cyber knowledge to real world power – what are limits
- Over dependence on technology – intrusion into decision making
- Clusters of communities – who do I belong with?
- Every individual an information –influence target OR as a sensor
- Individual digital footprint is increasing – can be spoofed

3. Implications:

- Social/ psychological impact of instantaneous communications
- Atomized IT (connectivity but isolation)
- Vulnerability to violation of OPSEC – new forms required
- Cyber wars

NATO OTAN

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SFA/FFAO Workshop
Cadiz, Spain

Ms. Jackie Eaton ,

STO

Technology Lead

Technology syndicate

The Rate of Technology advance

1. Baseline:

- Big tech companies are making software open source (Google, Apple, IBM etc.)
- Chinese telecom companies “all in” on AI
- Scientists are calling for regulation of CRISPR etc. versus start ups being free and loose with legal and ethics (e.g. Facebook)
- Eric Schmidt is calling for government to learn from software development practices
- Some legacy systems are too expensive to update
- In commercial world, interoperability is increasing not decreasing
- Legal constraints still in negotiation after decades (e.g. Laser weapons)

2. Key Takeaways/Implications:

- Data is the new gold
- Algorithms writing algorithms speed everything up
- Crowd sourcing as a new exponential driver for technological advance
- Rate of advance in commercial world will be more than exponential, but military adoption may be more linear
- Legal and ethical constraints slow down democracies more than potential adversaries
- Modularity is the response to insert rapid developments in acquisition
- If building blocks are available, people will build, no matter what

Technology syndicate

The Access to Technology

1. Baseline:

- Next Olympics will test for modified genes
- DNA screening on pre-born
- Small start ups can enter market segments that were previously exclusive to large industry (e.g. Boom supersonic plane)
- Access to space has increased: low cost at $1000 per kg and companies open space assets to the crowd
- China is collecting all data on human behavior for social credit scoring
- Netflix exploits behavioral data to roll out its service worldwide

2. Key Takeaways/ Implications:

- Technology enhances access to skills, knowledge and resources (e.g. YouTube videos, crowd funding, etc.)
- New technology will take off when there is a business case, while old technology will persist in parallel (e.g. 3D printing with hobbyists, criminals, in remote areas, etc.)
- Data is not geographical, elements of human behavior are universal others are cultural
- Increase in black market for individuals to gain access to data (not just uranium)
- Potential increase of technological inequality either due to barriers or rejection of technology
- Individuals are not subject to government controls (e.g. engineering dog DNA at home)

Technology syndicate

The Global Network Development

1. Baseline:

- Speech and video software already allows real time facial and speech forgery
- People are becoming more used to fake news and able to spot it, no longer strategic shock
- 5G will deliver in 2022, but China is developing its own “5G” (like GPS)
- “Curious noses” distributing 20,000 pollution sensors in Belgium
- Internet of Things: the most vulnerable node on the network is your air conditioning/Barbie
- Multipurpose assets, for example lamp posts can also charge cars, host networked sensors/cameras or be network base stations
- Air deployable self-configuring routers make deployable wifi networks

2. Key Takeaways/ Implications:

- There is a tendency to think in dystopian terms: technological Mutually Assured Destruction
- We’re all relying on the same infrastructure, so disruption is less likely, not more
- Fake news will be more convincing, but technology will help identify/counter fake news
- If 5G delivers, all personal videos become a potential data source for detecting anomalies e.g. civil unrest
- CISCO predicts 200Bn devices on the Internet of Things by 2027
- Internet of Things means data and computing power is distributed
- Global acceptance of surveillance for it’s benefits: China “safe city”, monitoring elderly, crime prevention

Technology syndicate

The Dominance of the commercial sector in Technological development

1. Baseline:

- China is investing 30bn in AI, b
- China has no clear line between government, commerce and academia whereas the West is divided
- Defence sector competing for available brains
- Twist Bioscience storing data in DNA so that we can store data forever at higher density and with lower energy requirements and higher reslience than current tech, but slower access rate
- A start up has crowd funding for destroying favelas and 3d printing new homes from the waste and doing the same in outer space (e.g. Mars)

2. Key Takeaways/ Implications:

- We won't be able to verify/reverse engineer everything in the software in the future, we already can't
- Alliance will be more dependent and bound to the commercial sector
- Future tech companies will be post-governmental entities

Technology syndicate

Technological dependencies

1. Baseline:

- Immigration policies are blocking smart people from entering US and blocking innovation
- Most innovative minds are not in the military or government, they are working for industry
- Big companies have an almost religious following
- Skills are being lost (e.g. map reading)

2. Key Takeaways/ Implications:

- Dependence in the community affects the regulation from government
- The community needs to be resilient

Supreme Allied Commander Transformation

SFA/FFAO Workshop
Cadiz, Spain

Mr. Mark Tocher

Environment Lead

Environment

Where we are and what we know?

- Collective action and intertemporal problem
- Climate change - 2^0C baked into atmosphere, sea level rise, decreasing ice coverage, changing weather patterns, complex system of interactions
- Environment Stress – decreasing biodiversity, pandemics, increasing range of tropical disease
- Natural disasters – increasing number of weather events, increasingly exposed populations, cascading effects
- Used analogues to breakdown analysis
  - Climate Change = mitigation + adaptation + residual issues
  - Nexus of food, water and energy

Environment

Key Takeaways

- Increase Energy Efficiency – implementation issues that require behavioural change (Social Media), taxes, new data storage rules, situational awareness
- Increased use of Renewable Energy and Storage (supported by Advanced Materials and AI)
- Geoengineering – governance, testing, termination
- Sensor performance will change as models will be wrong
- Improved desalination and purification through advanced materials
- Responses to growing arable land required to feed meat sources, GMO, lab-grown meat.
- Application of predictive analytics and AI to natural disasters
- Specialized military units to react to natural disasters within a comprehensive approach
- Difficulty operating in the Arctic due communications, navigations and residual ice.
- Need and interconnected system of sensors to monitor Arctic
- Predictive Analysis, monitoring and Genetic Engineering and other research to address growing risk of pandemics
- Solutions may be not just tech : mindset, education play a large part

Part - 3

Regional Perspectives

Deliverable:

- Where we are, what we know, key takeaways, two-three scenarios and key words or phrases for computer aided analysis to identify indicators.

SME/Moderator for Breakout Sessions

PART: 1 – Confluence of Technology Trends and their influence on trends in other domains					
Theme	Political	Human	Technology	Economic/Resources	Environment
SMEs	Dr. Quentin Ladetto	Mr. Jeff Becker	Mr. Gabriele Rizzo	Dr. Adrian Kendry	Mr. Mark Tocher
HQ NATO	Mr Gabriele Cascone		Ms. Jackie Eaton (Lead/SME)		
ACT/ SA	Mr. Mehmet Kinaci LTC Aaron Bazin Maj Aparicio	COL Sven Szabo LTC Pierre Asencio CDR Rob Sinram Mr. Jeff Reynolds	CDR Jean-Luc Devillers COL Tibor Szabo	LTC Richard Pleijsant Maj Isabel Guerra	CDR David Sherriff LTC Fleming Jensen Dr. Katarzyna Zysk
Navy Reservists	Michael Braswell	Richard Carroll	Tiffany Stuflick Katrina Butler	Timothy Tuck	Tony Garcia

PART: 2 – Regional Perspectives				
Region	Russia-Eastern Europe	Asia - Pacific	Arctic	Middle East and North Africa and Sahel
SMEs	Dr. Flemming Splidsboel Hansen	Mr. Jeff Becker	Dr. Katarzyna Zysk	LTC Pierre Asencio
HQ NATO	Mr Gabriele Cascone		Ms. Jackie Eaton	
ACT/ SA	COL Tibor Szabo LTC Aaron Bazin CDR Rob Sinram	Mr. Mehmet Kinaci COL Sven Szabo Dr Adrian Kendry LTC Ken Martin (AUS Army) Mr. Jeff Reynolds	CDR Jean-Luc Devillers LTC Fleming Jensen CDR David Sherriff Mr. Mark Tocher	LTC Richard Pleijsant Maj Isabel Guerra Maj Aparicio
Navy Reservists	Michael Braswell Tony Garcia	Richard Carroll	Timothy Tuck Tiffany Stuflick	Katrina Butler

Part 3: Breakout Sessions Regional Perspectives

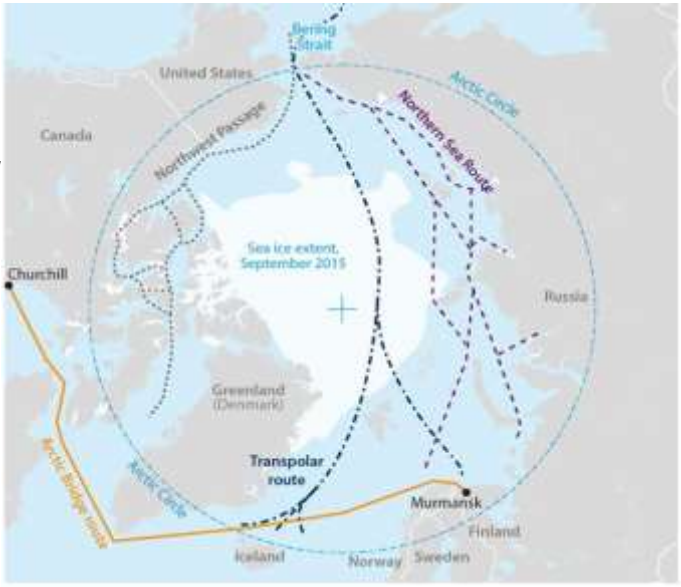
PART: 3 – Regional Perspectives					
Region	Russia-Eastern Europe		Asia - Pacific	Arctic	Middle East and North Africa and Sahel
SMEs	Dr. Flemming Splidsboel Hansen		Jeff Becker	Dr. Katarzyna Zysk	Pierre Asencio
ACT/ SA	Tibor Szabo Aaron Bazin Rob Sinram		Mr. Mehmet Kinaci Sven Szabo Dr. Adrian Kendry Ken Martin Jeff Reynolds	Jackie Eaton Jean-Luc Devillers Fleming Jensen David Sherriff Mark Tocher	Richard (Rik) Pleijsant Isabel Guerra Eduardo Aparicio
Navy Reservists	Michael Braswell Tony Garcia		Richard Carroll	Timothy Tuck Tiffany Stuflick	Katrina Butler
Participants	Andrzej Kubisiak Carlos Martinez Aleksander Leoniak Wagn Christensen Lars-Ove Roos Grzegorz Adamcyk Klaudia V. Lengyel Haldun Kocak Lucian Munteanu Jaromir Mikulenka Petr Pargac Gheorge C. Bogdan Timothy Dreifke Gabriele Rizzo Robert Sinram Gyula Bene Janos Szonyegi Daniele Paradiso Orlin Gergov Nikolay Kotsev	Quentin Ladetto Roberto Mastrotto Bharatkumar Patel Vojtech Fucek Eliseo Perez Gomez Jan van der Veer Krasimir Parashkevov Thierry Vautrin Martina Podvrsnik Fabio Corona Malin Severin Olivier Schneider Arturas Petkus Gabor Czirfusz Carsten Schlueter Staffan Sjoberg	Shannon Wells Andrea Rulli Christian Greyfie de Bellecombe Marcel Kerstens Bryn Richards Ken Martin Frank Christian Sprengel Joel Mozer Joachim Klerx Michael Perrone Gitanjali Adlakha-Hutcheon David Smith Louise Hoehl Bayardo Abos Gabriele Cascone	Johann Jamnig Staffan Sjoberg Bertrand Bara Rolf Rasmussen Fabian Baxa Jyri Saanio Kristian Knus Larsen Alberto Zamboni Geir Arne Hestvik Ruud Schoonen Richard Kastelein Goran Kindvall Katarzyna Zysk Miroslaw Skowronski Darryn Gray	Daniele Piperno Diego Martinez Canavate Leopold Schmertzing Steven Rose Olaf Theiler

Breakout Sessions

Arctic

Where we are: (Our baseline assessment)

- The Ukrainian crisis and illegal annexation of Crimea have wrought tension between Russia and its Arctic neighbours casting a shadow over Arctic affairs.
- The 2014 IPCC report stated with very high confidence that the Arctic will continue to warm more rapidly than the global averages.
- There is a growing and legitimate concern that the current era of high political stability in the Arctic may be lost.



What we know: (Facts)

- Putin describes the Arctic as an area where the military, political, economic, technological, environmental and resource aspects of Russia's national security converge.
- China: We are a 'Near-Arctic State' and we want a 'Polar Silk Road'.
- The geostrategic importance of the Arctic in world politics and the global economy is increasing.
- The region contains 13% of the world's undiscovered conventional oil and 30% of its undiscovered conventional natural gas, according to estimates by the US Geological Survey, as well as mineral deposits.

Arctic

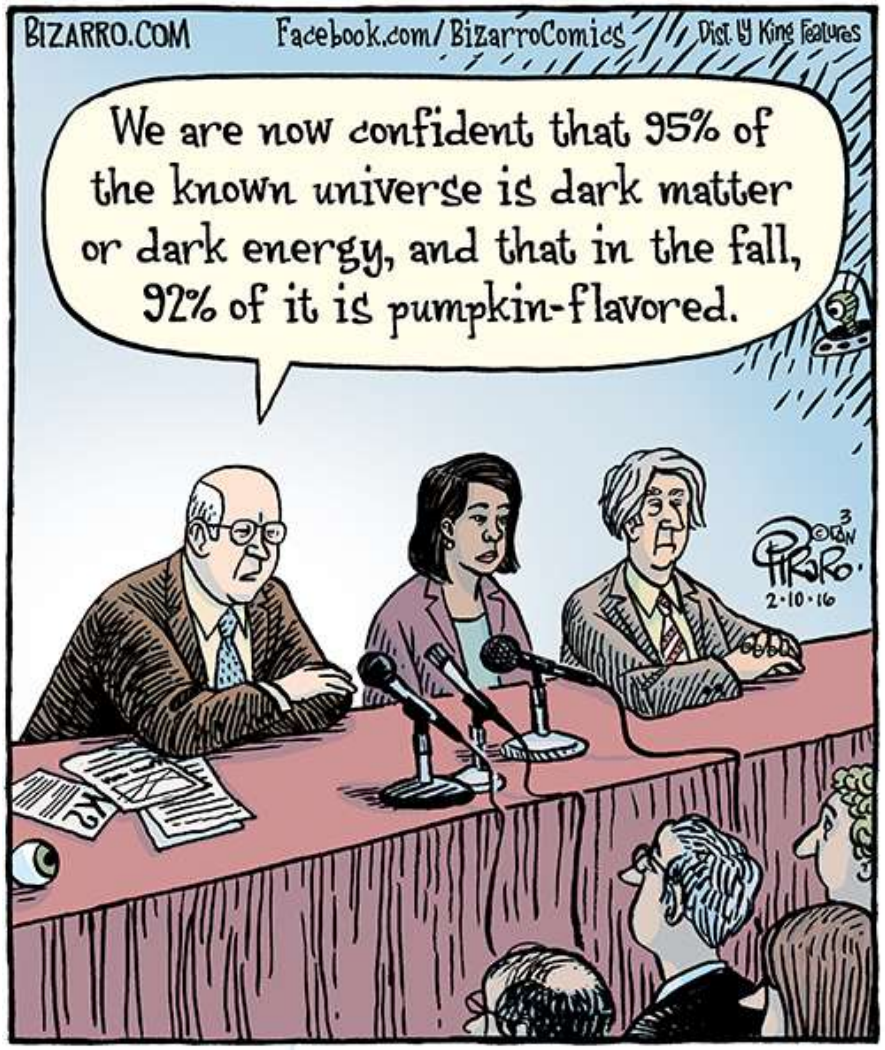
What we don't know: (Our Questions)

- Is the Arctic going to be the next South China Sea with competing territorial claims constantly threatening to devolve into armed conflict?
- Who will determine policy for the region?
- Will Arctic resources be cost-effective for extraction?
- What will be the impacts of renewable energy and electric vehicles on the price of oil and natural gas?
- With a decreased competition for resources, will there be less incentive to turn the Arctic into an arena for state conflict by 2040?

What are the projections out to 2040 (Key Takeaways and Implications):

Work Shop Outbriefs

- Two Plenary Outbrief Sessions
  - Technology
  - ***Regional Perspectives***
- SME/Moderators
- Outcome of breakout sessions
- Potential scenarios, key words and/or phrases



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Asia-Pacific

Regional Perspectives –Asia Pacific

1.Where we are and what we know:

PRC

- One China policy / recognition – Taiwanese defense modeling w/ US influence
- PRC is turning to focus on blue water Navy+A2AD development (less amphib)
- Economic policies – Trade “war” / currency manipulation
- Fortification of South China sea is a “done deal” – PRC can project further
- The rate of development is rapidly increasing in PRC
- Who is the Phillippines courting
- Indonesia vs China in maritime domain – China may want Indonesia disorganized and expand its “string of pearls” port investment– Indonesia chasing a blue water navy

Korea

- Also possible nuclear proliferation in ROK in response to North Korea acquisition
- PRC wants status quo on Korean peninsula –maintain buffer solely thru political means
- ROK / Japan friction
- North Korea will still need lifeline to PRC but may test room to maneuver politically
- Unique sources of foreign capitol for North Korea (from ransomware to nukes)
- “The Art of the Deal” w/ Trump in North Korea
- ROK fluctuation between liberal/ conservative – ROK military is hardline against unification
- Assume that North Korea will eventually implode

Regional Perspectives –Asia Pacific

2. Key Takeaways:

- Korean peninsula as testing ground for the nuclear option – but its mountainous
- Regional states (Vietnam/ Indonesia) have friction with PRC
- US as stabilizing factor –will it continue (can US handle “2 front” forces – offset PRC and Russia)?
- If US rotates focus to Pacific can/ will NATO adapt –fill the gap (Poland)
- PRC fragile economy – they import all of their oil – pursuing pipelines as opposed to shipping – they must grow to employ their citizens
- PRC as a collective society will gain power thru means other than weapons (economics/ funding “Confucian” societies in foreign learning area/ exerting pressure by lobbying)

3. Implications:

- Could there be an ISIS 2.0 version in Phillippines/ Indonesia
- Change from Japanese defense force to offensive/ nukes –offset North Korea/ PRC
- Regional nations looking for arms (A2AD-anti ship missiles) as cost effective offset to PRC

Regional Perspectives –Asia Pacific

4. Scenarios:

- Non kinetic globally shaping China
- Global Naval China: America is 2nd pushed back behind the second island chain
- North Korean implosion or a change to Korean confederation as 12th largest economy
- Indonesian Islamic presence –nationalism – change of Indonesian leadership (ISIS) – cultural clash –Malaca straits
- Russian turmoil creating issue in Kurile Islands
- Indo Pacific –China's solid backing of Pakistan to offset India
- An internal PRC fracture –rising middle class (Tiananmen 2.0?) - PRC fall impacting the Korean peninsula
- PRC influence projection to space

5. Key Words, Phrases:

- De-nuclearization, Confucian ideals, Indo Pacific, Chinese Navy, South China Sea, East China, Sea of Japan, China, South Korea, North Korea, Indonesia, Vietnam, Philippines,

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Arctic

Breakout Sessions

Arctic

Key factors affecting the development:

- Despite ice receding, the operating environment remain challenging most of the year
- Stable region, with a broad web of governance regimes, important form a geopolitical perspective, with globally important energy resources and potentially strategically important sea lines of communication, and some unresolved legal issues
- Limited shipping in short-term perspective (cost insurance, risk, technological)
- Long-term NSR has the highest potential to be developed in a commercially viable option
- China's interest is on the rise (shipping, energy, minerals, political, fishing), making serious commitments
- Greenland has been discussing independence for a few years; rich mineral resources, including rare earth minerals
- Resurgence of military presence and activity
- Safety and security (SAR, disaster relief) inadequate – security challenge

Breakout Sessions

Arctic

Key takeaways:

- More international commercial cooperation (Russia, Total, Exxon Mobile) may increases the interdependency and common interests, and therefore may be a stabilizing factor

- More violent weather patterns, more drifting ice, may potentially make the operations more challenging

- Potential technological advances (ships construction, resources extraction, communication, navigation, situational awareness) may facilitate the commercial and other human activities

- non-Arctic and non-NATO states with interest in maintaining access to the Arctic may complicate conflict scenarios

SCENARIO 1: Shipping and oil spill disaster

- long-term impacts of a ship grounding or of a collision, sending oil into the territorial waters of other nations?
- potential disastrous environmental consequences
- likely to impede economic development in the region
- likely to threaten the way of life of the indigenous population
- higher death toll would expose the inadequate SAR and law enforcement capacity in the region

- What if most of those fatalities are citizens of a country not a full member of the Arctic Council?
- Could it bring nations closer together to work in cooperation to prevent similar future tragedies?
- Or conversely, would another nation use the events as a pretext to fundamentally disrupt the Arctic Council and force a change in Arctic governance? Would the governance be challenged by the most affected nation?

SCENARIO 2: Greenland's future

- Greenland "goes alone" by seeking independence
- is aggressively courted by China
- or Russia that conducts info ops campaigns to destabilized the relationship with Denmark as a part of campaign to destabilize NATO, and weaken the presence in the Arctic

- How might that alter the dynamics among Arctic nations and between Arctic and non-Arctic states?

- Have Europe and the United States and NATO given adequate thought to the consequences of an independent Greenland, with about fifty thousand citizens sitting astride a strategic strait to the Arctic halfway between Europe and North America?

SCENARIO 3: Russia–China strategic alliance

- Russia establishes a NATO like relationship with China

  which also extends to the Arctic, opening up and strengthening Russia–China cooperation (mining, shipping, energy, minerals).

  A much stronger presence of China in the Arctic with a stronger and more direct influence on the regional developments (economic, security environmental, etc.)

- What would be security implications?
- Governance regime?
- Environment and energy exploration?

SCENARIO 4: Strange bedfellows

- Either the United States or Canada force a resolution to the Northwest Passage (NWP) sovereignty issue
- Canada claims the NWP as “internal waters,” while the United States and other nations state the maritime channel is an “international strait” as defined under the UNCLOS
- If the United States or Canada decided to force a resolution to the NWP sovereignty issue, would Russia and China side with Canada?
- Could China use the Canadian NWP precedent to bolster its own claims on control of the South China Sea?
- What would that support for China look like? Would there be pressure (asymmetric response) applied in other parts of the world?

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Russia-Eastern Europe

Regional Perspectives – Russia Eastern Europe

Russia-Eastern Europe:

1. Where we are and what we know:

- Russia maintains its strategy to protect its borders, sense of insecurity.
- No further NATO expansion in Eastern Europe and/or Caucasus countries

2. Key Takeaways:

- Efforts at NATO expansion in Eastern Europe and Caucasus could trigger conflict
- Russia wants to maintain/increase influence and be arbiter for region – Eastern Europe, Caucasus, Central Asia
- Russia could try to exploit Russian speaking population in Baltics – particularly Latvia and Estonia

3. Implications:

- Russia at a cross-roads – short-term autocratic, potential long term partner depending on Russian internal politics and NATO actions/reactions
- NATO should maintain its deterrence position while keeping doors open for dialogue from position of strength
- NATO needs to improve resilience against Russian hybrid toolbox as Russia tries to find cheap solutions to intervene in NATO countries under Article V threshold.

Regional Perspectives – Russia Eastern Europe

Political (+)

- Energy driven economy fails due to falling energy prices
- Increased Chinese economic influence creates competition between Russia and China
- Russia improves governance, structural reforms support rule of law
- Reduced government corruption

- Energy markets diversified, prices increased
- Russia internationally respected and recognized as a great power
- Russia becomes a partner and follows international norms, laws, and rules
- Demographics changes are positive
- DFI
- Corruption is reduced

Economy (-)

Economy (+)

- Energy prices drop
- Economic stagnation
- Expected reforms not executed
- Russian foreign policy becomes increasingly unpredictable
- Lose control of security apparatus
- Demographic and environmental decline
- Lack of cohesion/Siberian Independence
- Man-made or environmental disaster

- Energy driven economy continues to develop
- EU and China continue to support economically regardless of political situation
- Russia maintains a narrative security focused
- Russia remains an autocratic state
- Regulations are eased for economic development
- Political constraints remain

Political (-)

Regional Perspectives – Russia-Eastern Europe)

Russia-Eastern Europe:

4. Scenarios: Positive-Positive

5. Key Words, Phrases:

- Energy, cohesion of NATO/EU, demonstrations, instability, credibility of government, cyber attack, physical attack,
- Obstruction of justice, nationalism, proxy wars, anti-democratic processes, critical functions of society,
- Critical infrastructure, staged attack on own infrastructure, lawfare, discredit western governments, separatism, extremism, disinformation,
- High North, China, Russia, Canada, USA, Norway, Denmark, Finland, etc.

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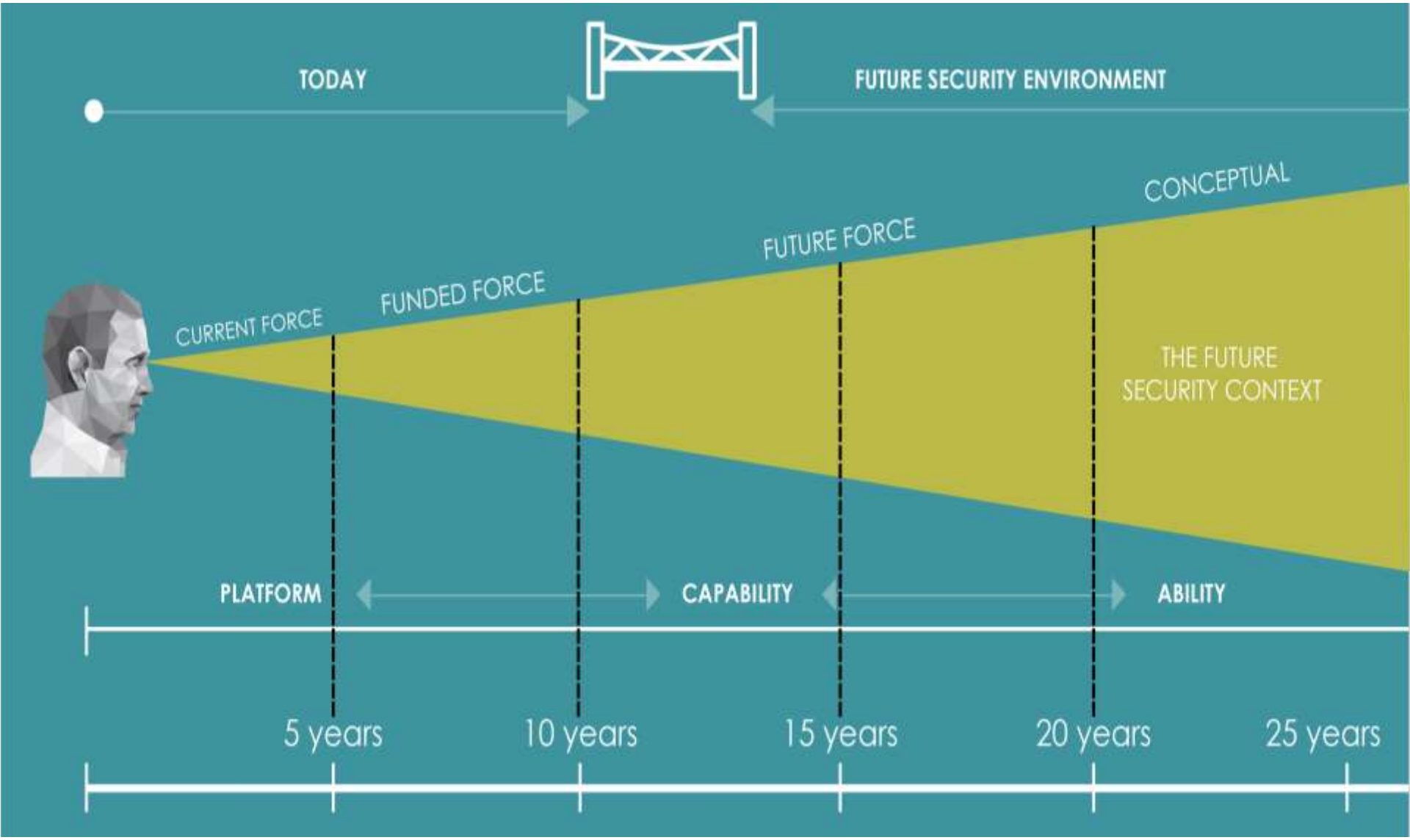
The MENA

Back-up Slides

Understanding Future Security Environment (FSE)



The Problem Statement (Why)

Determine how NATO should transform to continue to

- ***accomplish its core tasks, (Collective Defence, Crisis Management, Cooperative Security)***
- ***address the full range of security challenges,***
- ***establish and apply a unifying vision, and***
- ***advance a conceptual framework***
- ***for forces and capabilities required to succeed beyond the mid-term planning horizon.***

Aim, Objectives and Deliverables

The aim of the SFA Workshop is to take stock, review methodology, discuss best practices and to outline a proposed way ahead toward development of future Reports.

- Including computing power (deep learning, big data analytics and to some extent artificial intelligence) in the development of the next iteration of the SFA Report.
- Improve understanding of how confluence of technology trends will affect each other as well as other trends in different areas such as political, human, economy/recources and environment.
- In-depth analysis of the regions through regional perspectives in areas, such as the Asia-Pacific region, the Arctic, Russia-Eastern Europe, Middle East and North Africa & Sahel.

Deliverables:

- Inputs on trends where we are, what we know, what we don't know and potential projections towards 2040.
- Potential scenarios and key words or phrases for search to identify indicators in development of these scenarios.

FRAMEWORK FOR FUTURE ALLIANCE OPERATIONS

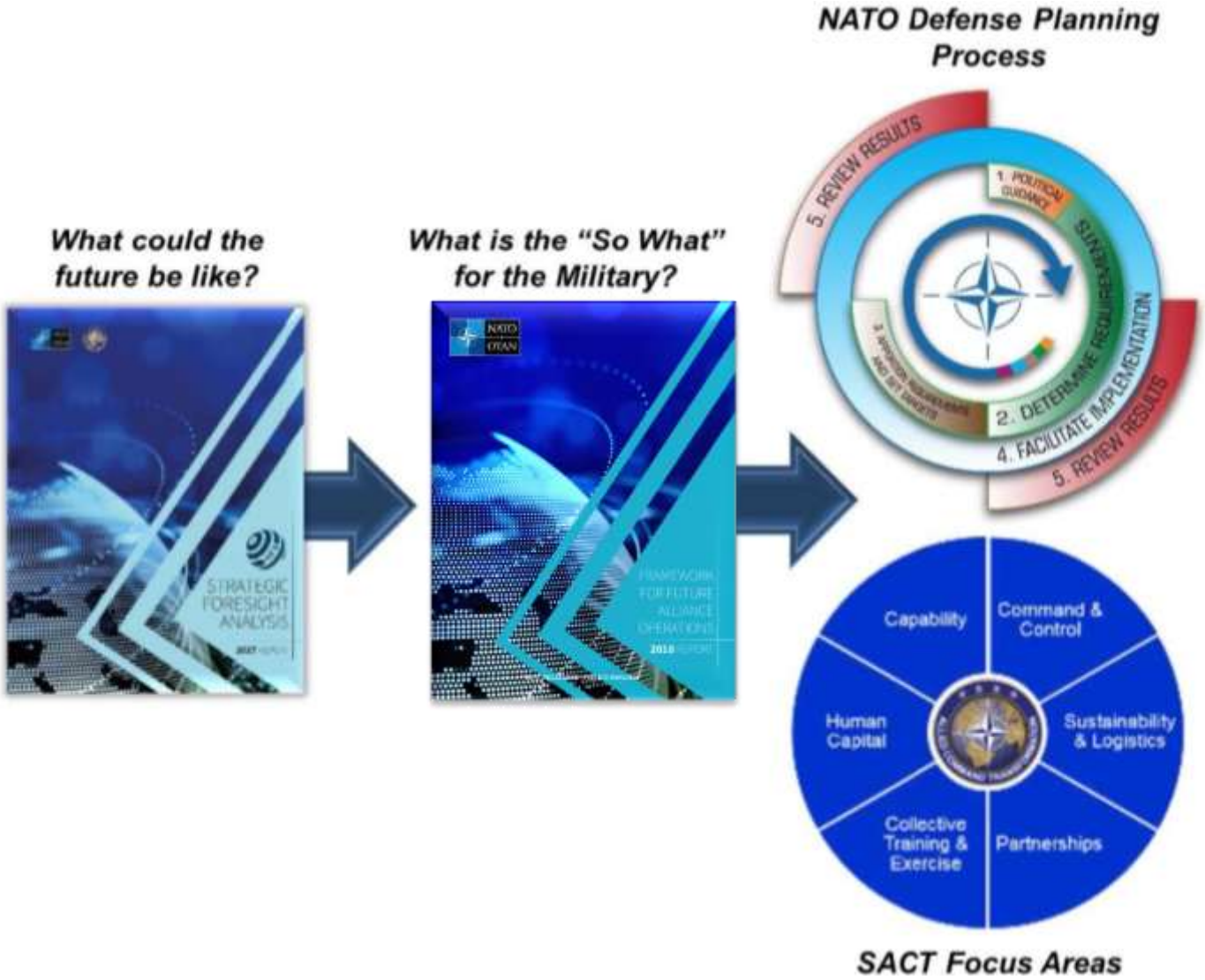
2018 REPORT

Purpose and Agenda

- **Purpose: To provide information on the Framework for Future Alliance Operations (FFAO) 2018**

- **Agenda:**
  - **The Long-Term Military Transformation Programme**
  - **What's New?**
  - **The Future Security Environment**
  - **What NATO Forces Need to Be**
  - **What NATO Forces Need to Be Able to Do**
  - **Cohesion Perspectives Project**
  - **Disruptive Technology**
  - **Questions / Discussion**

The Long-Term Military Transformation Programme



"The Military Committee directed the Strategic Commanders to develop the SFA and the FFAO to inform the NATO Defence Planning Process"

What's New?

A unique "first-of-its-kind" document in the history of the NATO Alliance

New Discussion/Emphasis on:

- ✓ Nature of war
- ✓ Character of conflict
- ✓ Legal and ethical questions
- ✓ Central Idea
- ✓ Enabling Elements
- ✓ Nuclear issues
- ✓ Terrorism
- ✓ Human capital
- ✓ Mission command
- ✓ Cross-domain operations
- ✓ Cyberspace and space issues
- ✓ Disruptive technologies
- ✓ Definitions/Glossary

Revised/Refined:

- ✓ Instability Situations
- ✓ Strategic Military Perspectives
- ✓ Military Implications

The Future Security Environment

Strategic Military Perspectives

To keep the military edge and prevail in future operations, NATO forces must continually evolve, adapt, and innovate and be:

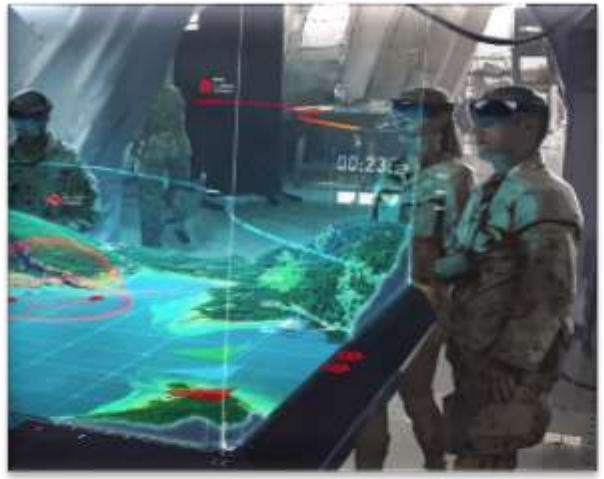
Military Implications

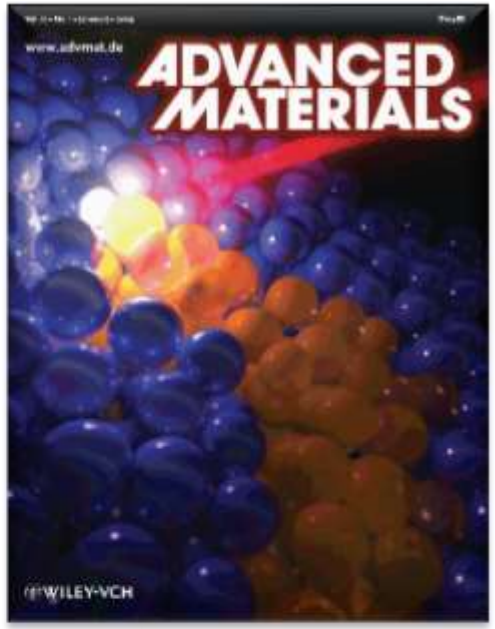
"Forces will need to develop a wide-range of abilities and work in close cooperation with partners to address the instability situations of the future"

Disruptive Technology

NATO Science & Technology Board, 2017, STO Technology Trends Report

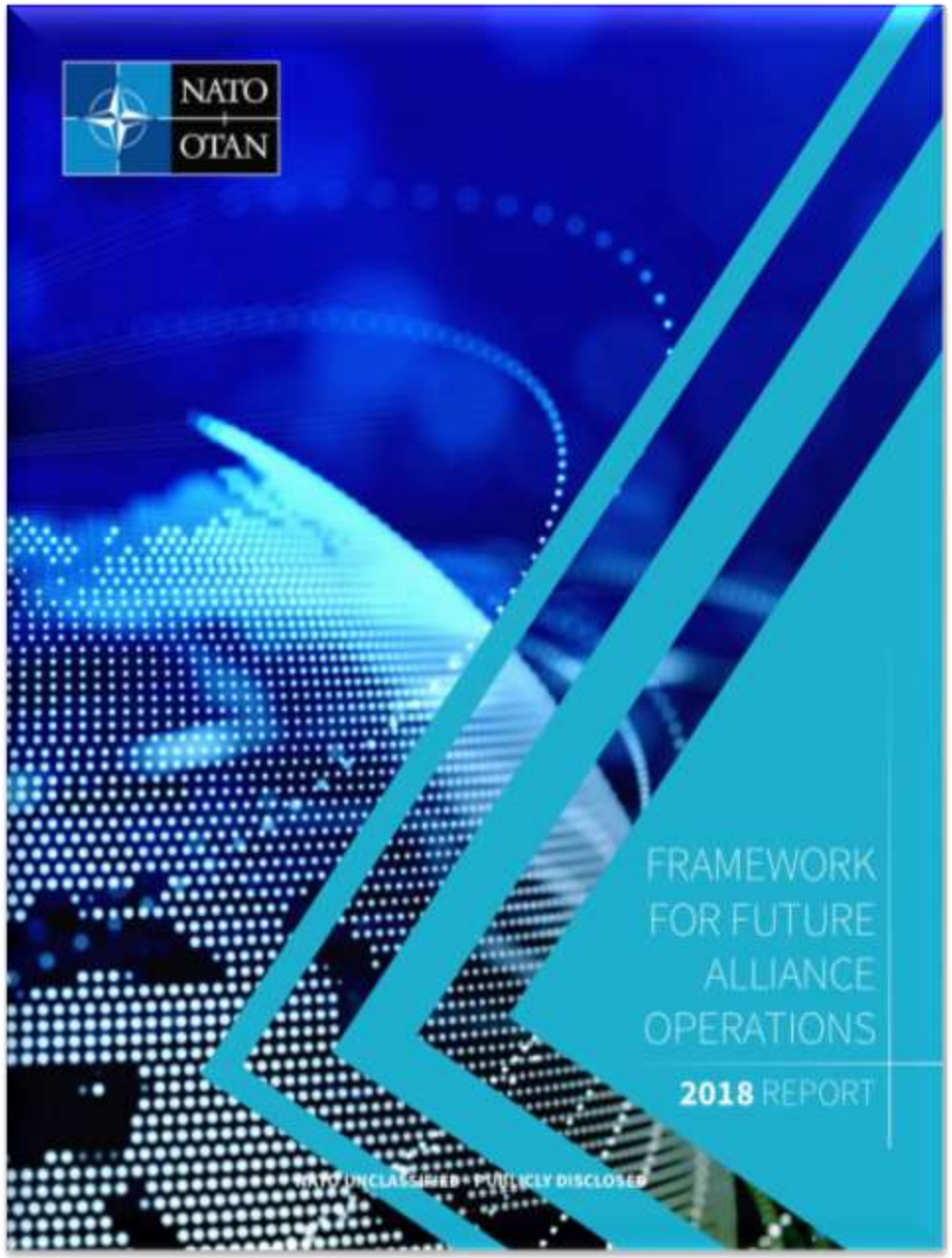
- ✓ **Additive manufacturing**
- ✓ **Everywhere computing**
- ✓ **Predictive analytics**
- ✓ **Social media**
- ✓ **Unmanned air vehicles**
- ✓ **Advanced materials**
- ✓ **Mixed reality**
- ✓ **Sensors are everywhere**
- ✓ **Artificial Intelligence**
- ✓ **Electromagnetic dominance**
- ✓ **Hypersonic vehicles**
- ✓ **Soldier systems**





Cohesion Perspectives Project

“The ultimate element of cohesion is the willingness to commit and sacrifice for others; an expression of something bigger than ourselves.”



“To keep the military edge and prevail in future operations, NATO forces should continually evolve, adapt, and innovate and be credible, networked, aware, agile, and resilient.”

http://www.act.nato.int/futures-work

FRAMEWORK FOR FUTURE ALLIANCE OPERATIONS

2018 REPORT

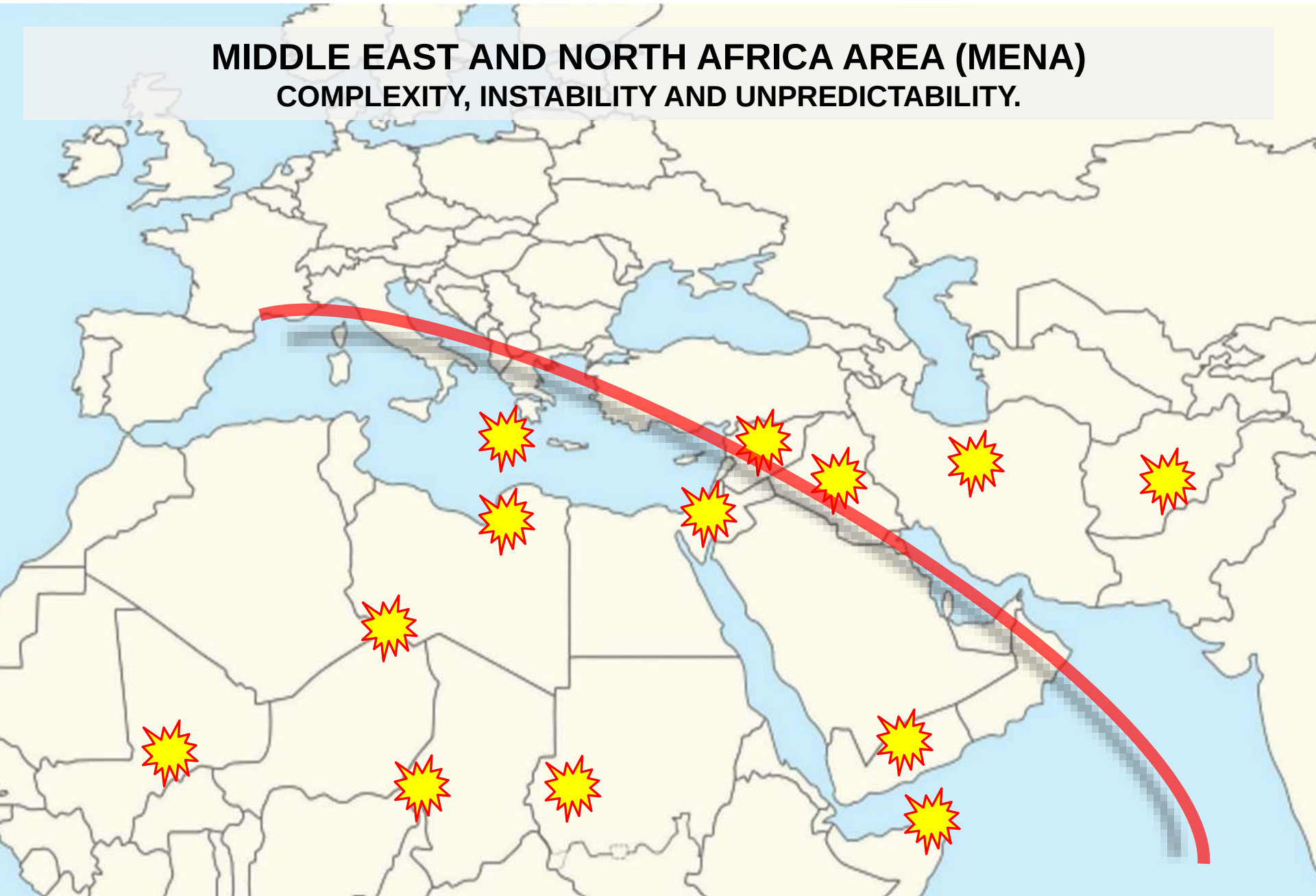
NATO OTAN

SUPREME ALLIED COMMANDER TRANSFORMATION

MIDDLE EAST AND NORTH AFRICA AREA (MENA) 2030

LCL (OF-4) Pierre Asencio FAF
Strategic Plans and Policy/Strategic Analysis Branch

FROM AN ARC OF CRISIS TO AN ARC OF VIOLENCE



CONTEXT

- **Middle East and North Africa: A world in crisis since 1967.**
- **In less than 10 years:**
  - **Arabic springs:** Tunisia, Jordan, Egypt, Yemen, Libya, Bahrein, Morocco, Syria.
  - **War and civil war:** Libya, Syria, Yemen, Iraq, Sahel.
  - **End of Dictatorship:** Ben Ali, Kaddafi, Mubarak.
  - **ISIS and the Calipha:** From Sahel to Afghanistan.
  - **Crisis:** Shia leadership (Iran) versus Sunni leadership (Saudi Arabia); Iran's nuclear program.
  - **Mass Migration:** A driver of polarization.
- **Civil societies will remain traumatized over several generations.**

General TRENDS 2030

- **HUMAN: Demographic transition not established yet.**
  - 500+ millions = European Union: Fertility rate >3.6, population +2% a year;
  - Two demographic bombs: Gaza strip and Nil valley.
- **ECONOMY: A shift towards ASIA.**
  - Scarcity of resources: Water, arable lands;
  - Oil economy impacted by USA energy autonomy and EU energy transition;
  - Neoliberalism, from a rentier model to a production model;
  - Lower standard of living;
  - Increase of criminal economy linked with mass migration.
- **SOCIETAL: Urbanization, friction and instability.**
  - Urbanization will have an effect on cultural mindset (patriarchal model challenged);
  - Secularization of Islam in counter action of Radical Islam;
  - Friction and instability of political models : ‘’State of right’’ versus ‘’Political Islam’’

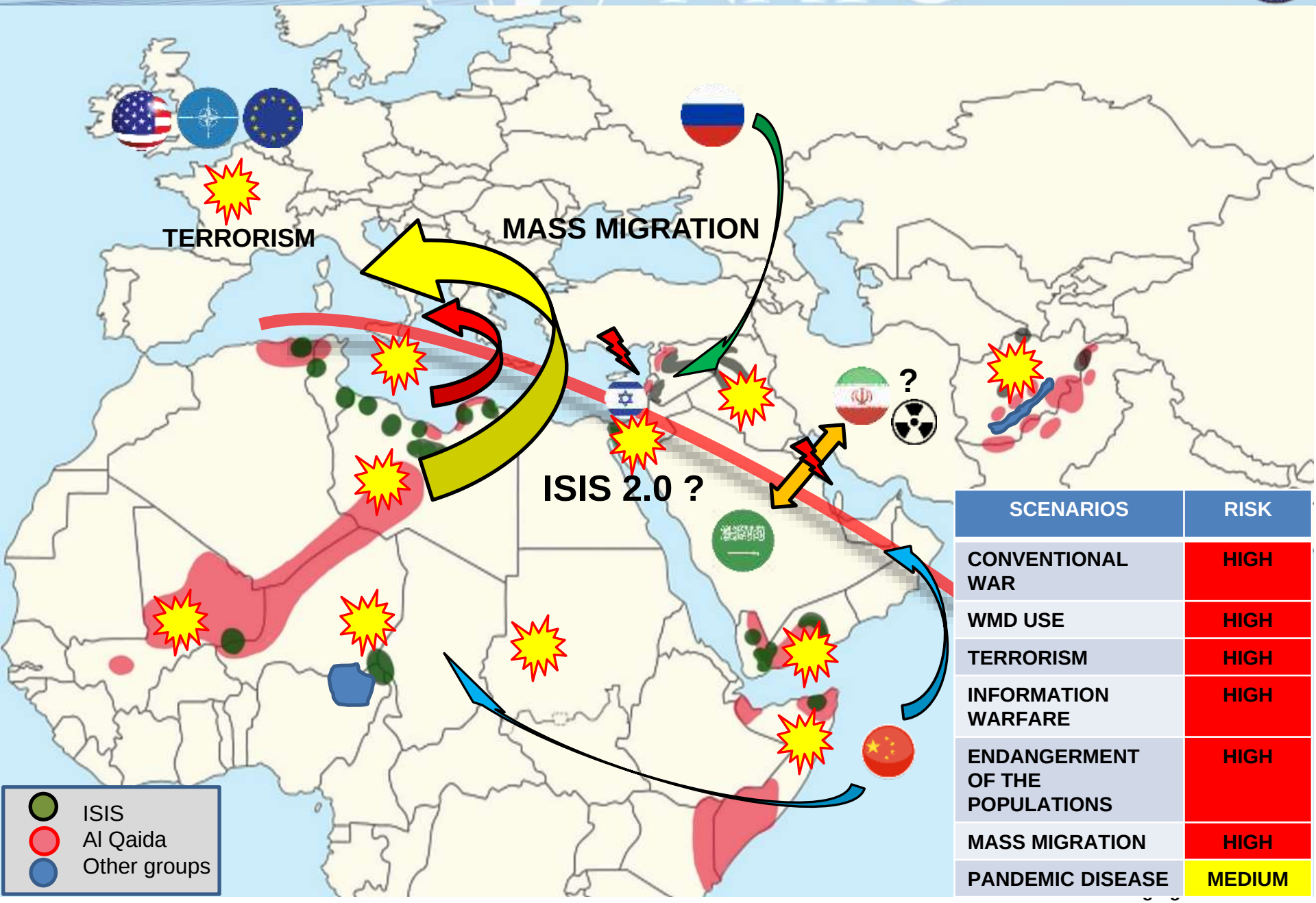
Political TRENDS 2030 : THE NEW BALANCE OF POWER .

- **USA: Progressive disengagement.**
  - Shift of strategy: Full Disengagement, Stabilization or Punitive strategy?
  - Aftermath of the vacuum ?
- **Russia: Restore political power.**
  - Reinforce presence in the Mediterranean sea and Suez canal area.
- **China: Be number one:**
  - Deploy to control access to strategic resources.
- **European Union: MENA, the principal geopolitical challenge:**
  - Radical Islam and terrorism will continue;
  - Mass Migration and its internal political effect will continue;
  - EU and NATO Cohesion will be challenged by the aftermaths.

Political Trends 2030 : The shock of the regional powers

- **Gulf area: The moment of truth, Shia versus Sunni influence.**
  - Iran will increase its influence from the Mediterranean sea to the Gulf
  - Iran's nuclear program ?
  - Saudi Arabia will try to reinforce its influence as a leader in the area.
- **Levant: Bankrupt states, persistence of grey zone.**
  - An area of competition between regional leaderships.
  - Political manipulation of Islam will continue;
  - ISIS 2.0 ? The war against terrorism is not over.
- **Israeli-Palestinian issue.**
  - Situation blocked, but Israeli and Palestinian more and more imbricated
  - Israel could stand alone.
- **Maghreb:**
  - Will try to strengthen the links with Europe.

ARC OF VIOLENCE 2030 RISK ASSEMENT



SCENARIOS	RISK
CONVENTIONAL WAR	HIGH
WMD USE	HIGH
TERRORISM	HIGH
INFORMATION WARFARE	HIGH
ENDANGERMENT OF THE POPULATIONS	HIGH
MASS MIGRATION	HIGH
PANDEMIC DISEASE	MEDIUM

QUESTIONS ?

Russia and Eastern Europe in 2035

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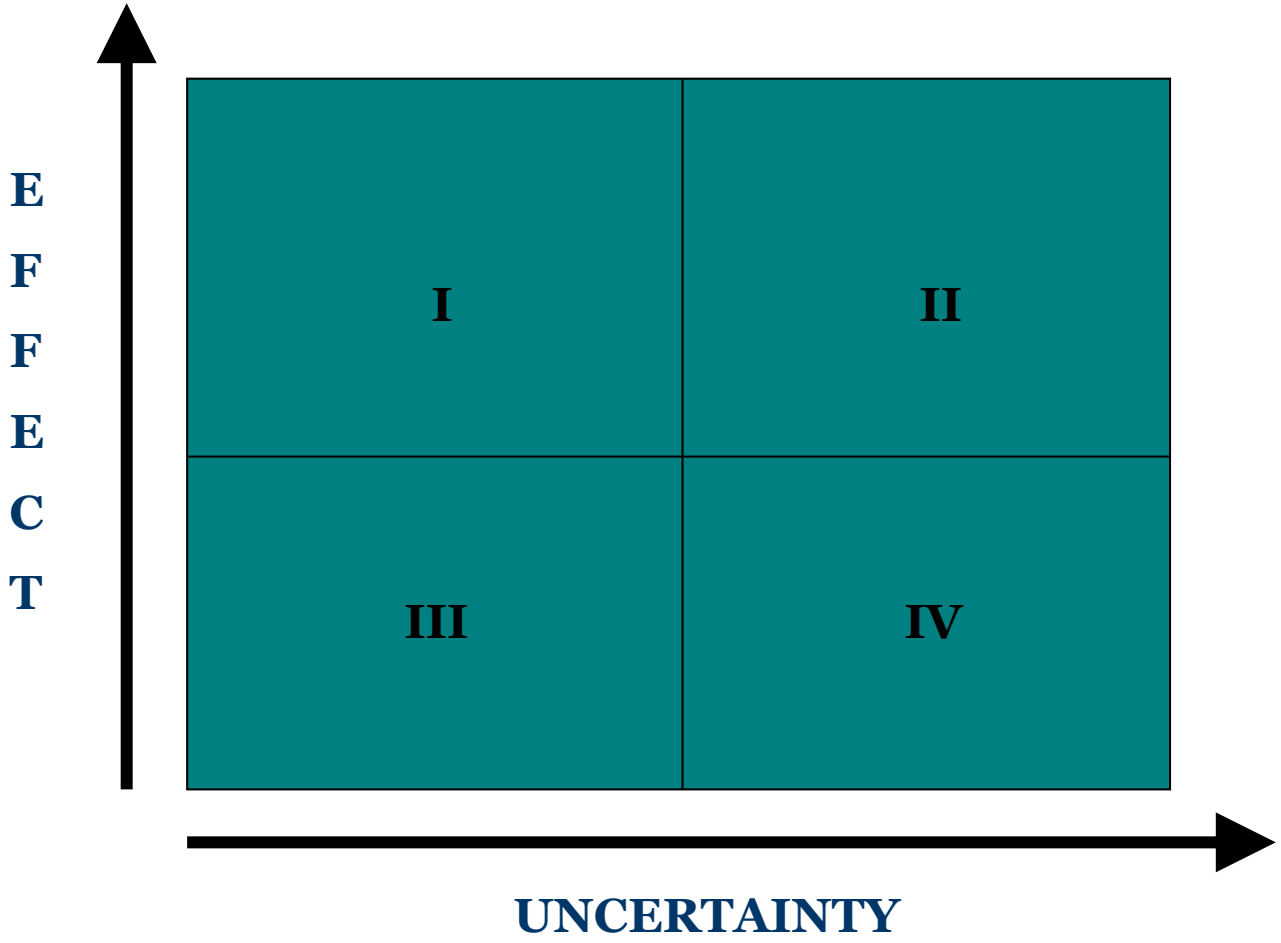
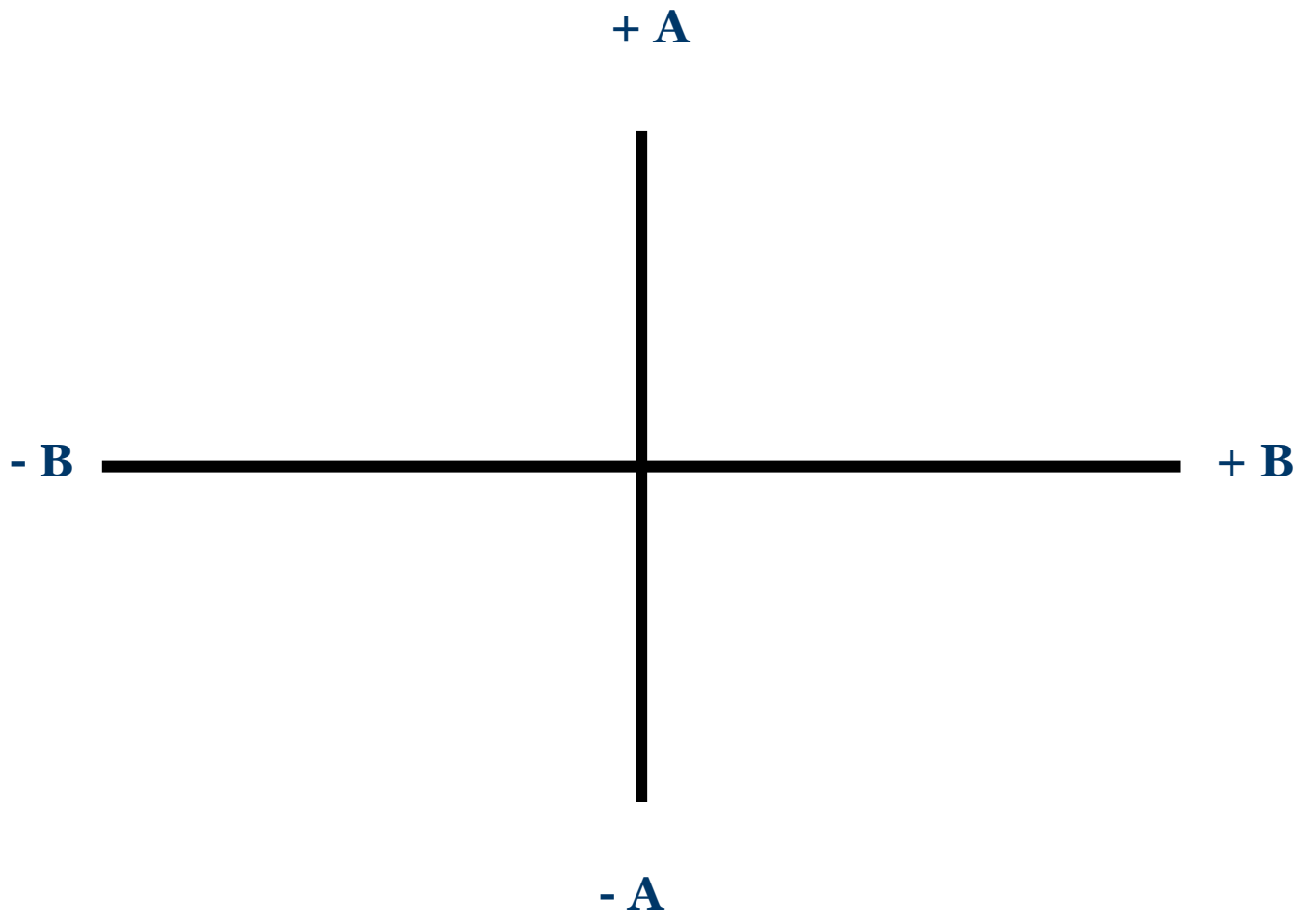
The Future
NEXT EXIT

UNCERTAINTY AND EFFECT



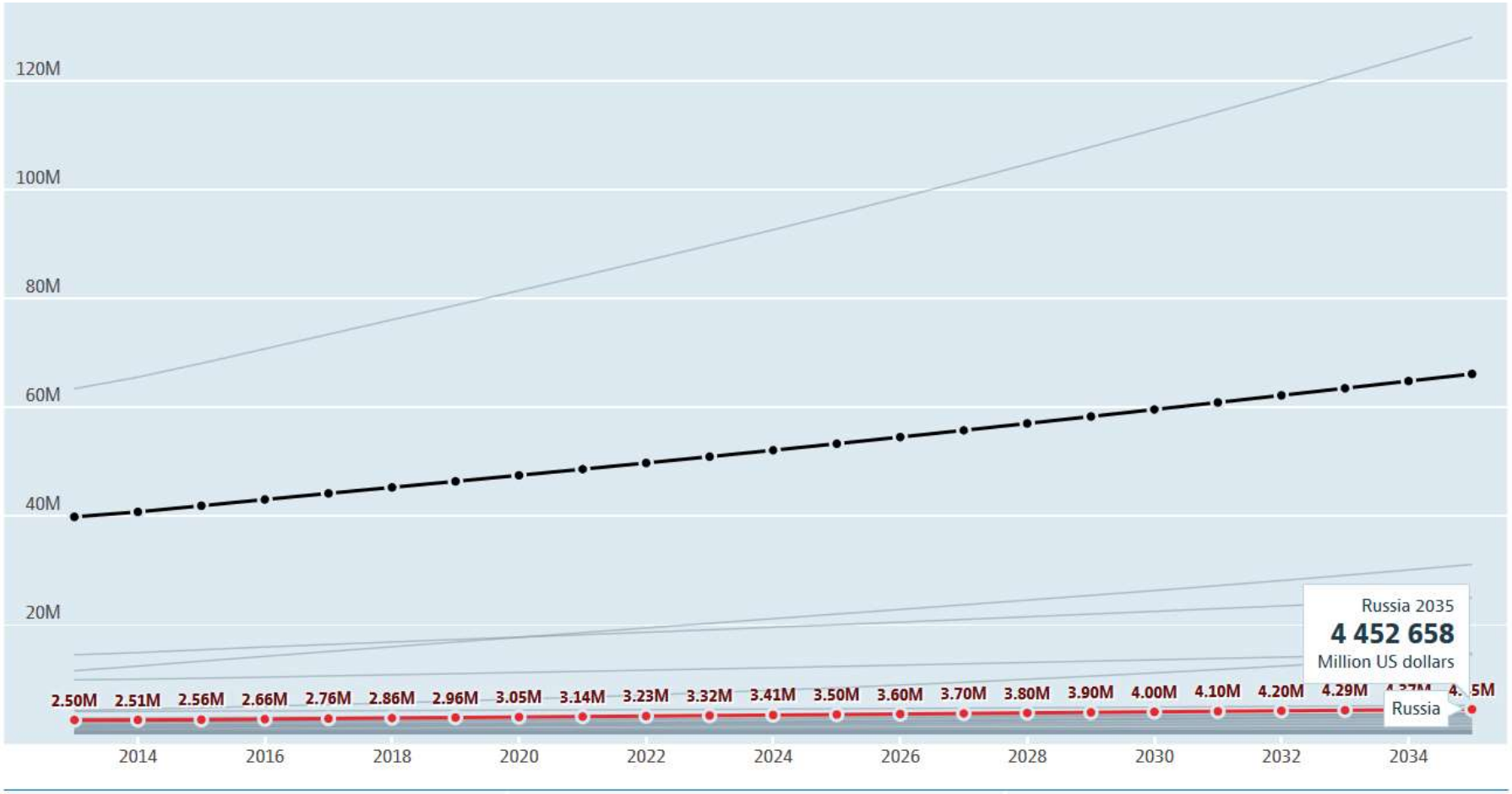
SCENARIOS



The economy

The economy is key

(≈ independent variable)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3.32M
3.41M
3.50M
3.60M
3.70M
3.80M
3.90M
4.00M
4.10M
4.20M
4.29M
Russia 2035
4 452 658
Million US dollars
Russia
2014
2016
2018
2020
2022
2024
2026
2028
2030
2032
2034

По вашему мнению, сейчас в России есть экономический кризис или кризиса нет?

Параметры опроса

ДАННЫЕ В % ОТ ОПРОШЕННЫХ

Structural reforms will be delayed

until urgently required

”In the economic sphere the main task is a fundamental increase in labour productivity. We must aim for the highest international levels”

”In the economic sphere the main task is a fundamental increase in labour productivity. We must aim for the highest international levels”

(Yuriy Andropov, 1983)

Trend #1:

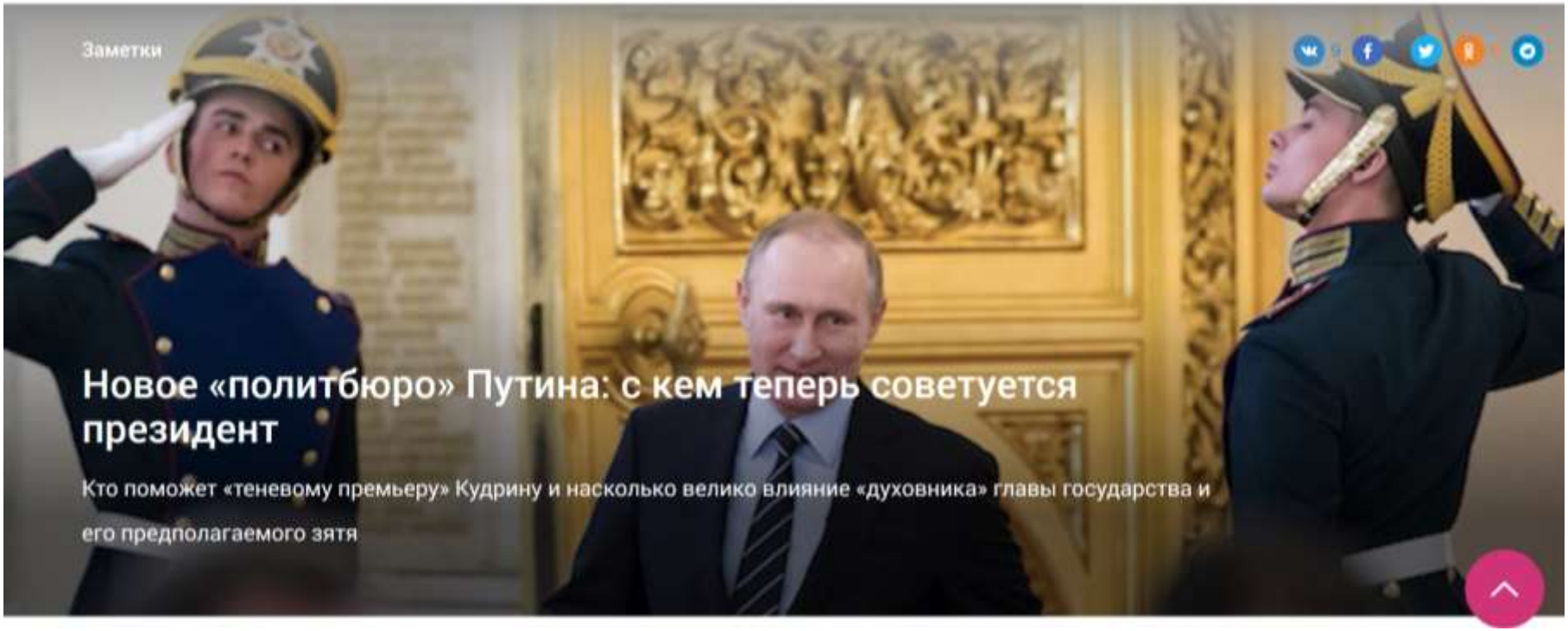
Growth will be low-moderate –

Some gaps will narrow, others will widen

Politics

By 2035 there will have been

(at least) one (managed) transition


Заметки
Новое «политбюро» Путина: с кем теперь советуется президент
Кто поможет «теневому премьеру» Кудрину и насколько велико влияние «духовника» главы государства и его предполагаемого зятя

The system has been re-calibrated

and now seems well-calibrated

CONTEMPORARY POLITICS, 2016
http://dx.doi.org/10.1080/13569775.2016.1201314

Routledge
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Russia's relations with the West: ontological security through conflict

Flemming Splidsboel Hansen

Danish Institute of International Studies, Copenhagen, Denmark

ABSTRACT

Employing the notion of 'ontological security', this study situates 'the West' within the contemporary Russian identity debate. It argues that opposition to an allegedly hostile West has cemented a collective Russian understanding of 'Russianness' which emphasises so-called traditional values and norms, all of which are said to be under pressure from the West. This process, so the article, is fuelled partly by endogenous preferences found within the Russian electorate, partly by political engineering and manipulation. The outcome is a more conflictual relationship between Russia and the West but also greater ontological security on part of the Russian population.

KEYWORDS

Russia; the West; NATO; ontological security; traditional norms

Баллистическая экономика

41

Российская армия получит «Кинжал», «Сармат» и «Авангард»

02.03.2018

The (first) post-Putin regime will attempt to draw legitimacy from this

Closer to 2035 political tension will increase

Trend #2:

The regime will largely manage to preserve stability but change is probable before 2035

Social life

"the top decile of wealth holders owns 77% of all household wealth in Russia. This is a high level, the same as the figure for the United States, which has one of the most concentrated distributions of wealth among advanced nations. Also interesting is that it is higher than the top decile share of 72% in China"

(Credit Suisse 2017)


ИКЕА
Для вашего дома

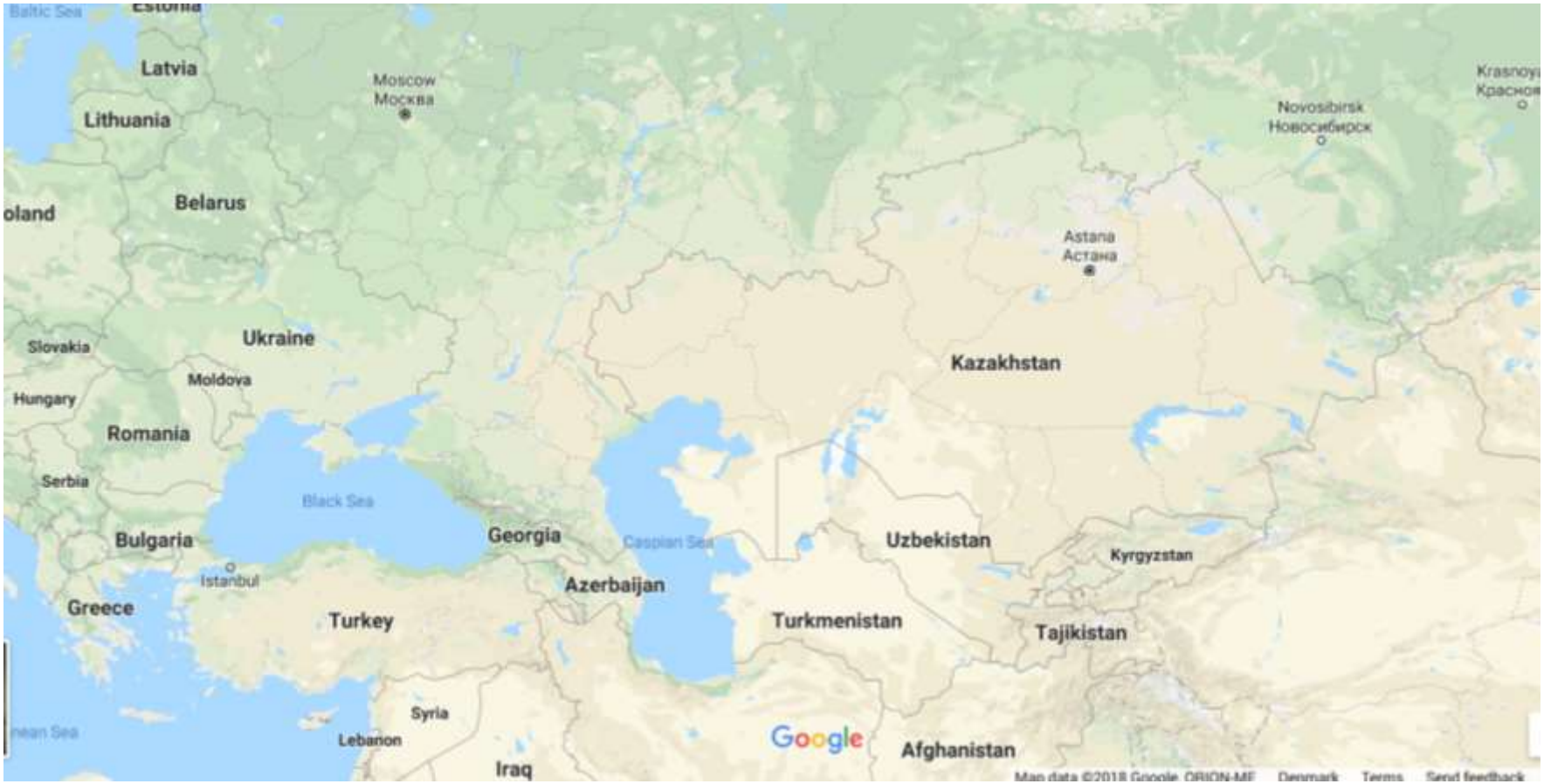
Trend #3:

Very different and competing processes – but overall Russians will be more individualistic and will value higher autonomy, access to information and links to the broader world

The post-Soviet space

Russia is still key – but still less so

(≈ independent variable)


Latvia
Lithuania
Belarus
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Москва
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Slovakia
Moldova
Hungary
Romania
Serbia
Kazakhstan
Black Sea
Bulgaria
Georgia
Caspian Sea
Uzbekistan
Kyrgyzstan
Istanbul
Azerbaijan
Greece
Turkey
Turkmenistan
Tajikistan
Syria
Lebanon
Iraq
Google
Afghanistan

The post-Soviet space will become increasingly fragmented

ARM
AZE
BLR
KYR
KAZ
MOL
RUS
TAJ
UZB
(TUR)
(UKR)

ARM
BLR
KAZ
KYR
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Trend #4:

The post-Soviet space will still have ties to Russia but these will be weaker and individual states may have few shared interests

Russia and Eastern Europe 2035:

- A more fragmented space with weak institutional settings and more dissimilar identities
- Russia will be less stable than today – stability will be challenged under post-Putin or even post-post-Putin regime
- Russian capabilities will increase relative to the West, decrease relative to emerging powers; major gaps will remain significant


СБЕРБАНК РОССИИ

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DCDC Futures Methodology

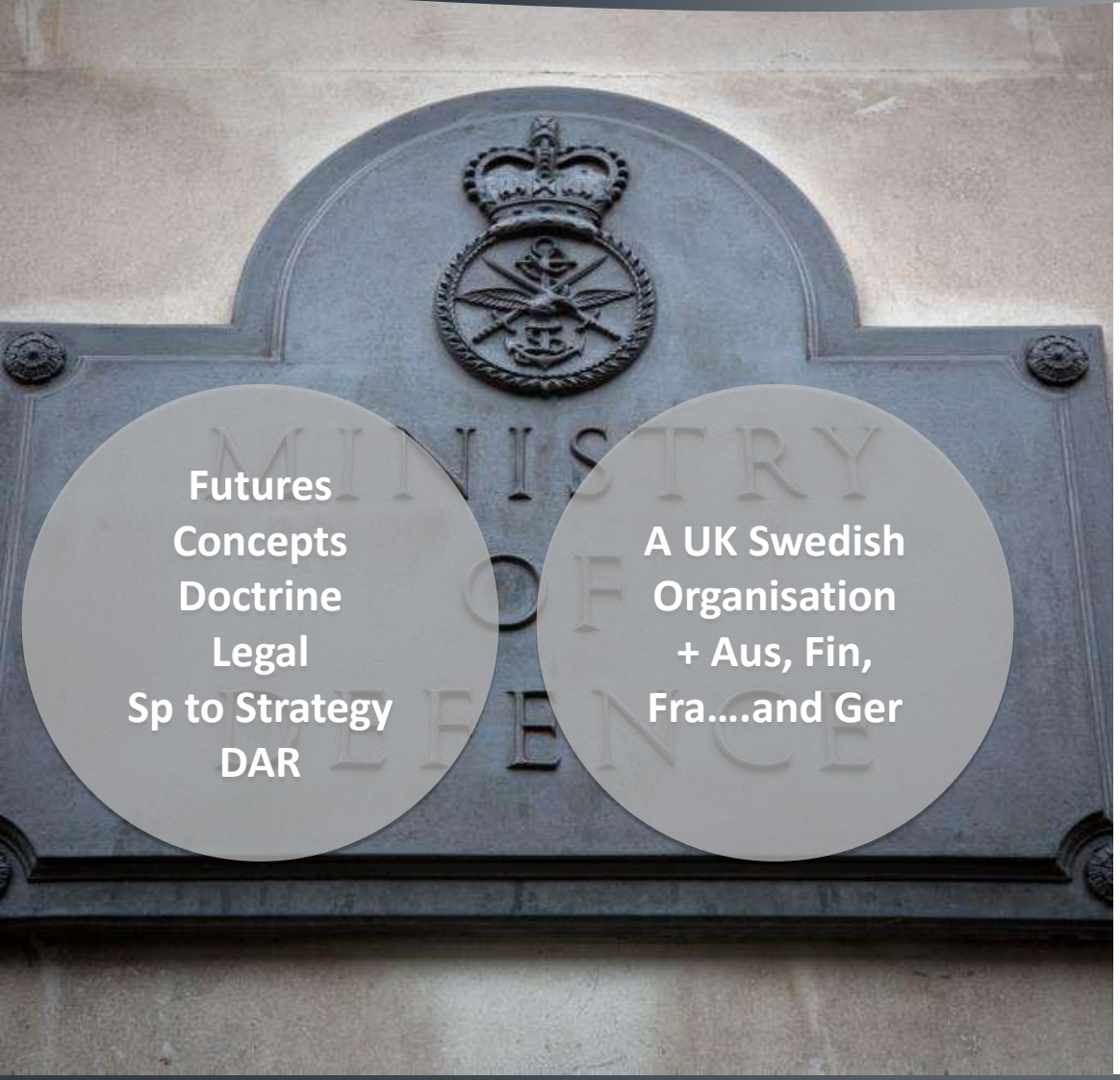
LTCOL Ken Martin
23 April 2018

Ministry of Defence

Scope

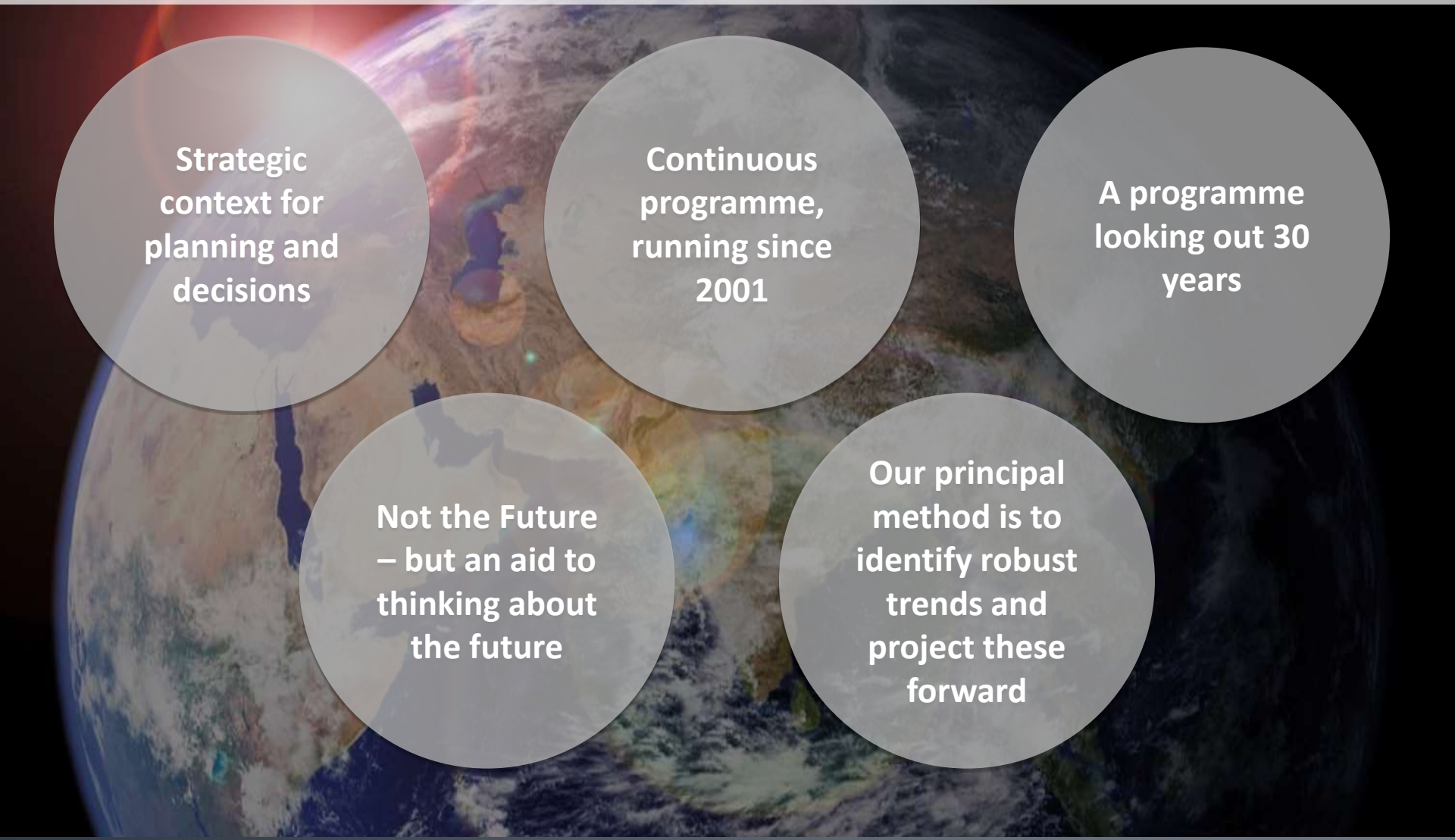

Overview of DCDC and the Strategic Trends Programme
Global Strategic Trends methodology
Going forward – the Strategic Analysis Programme

Introduction

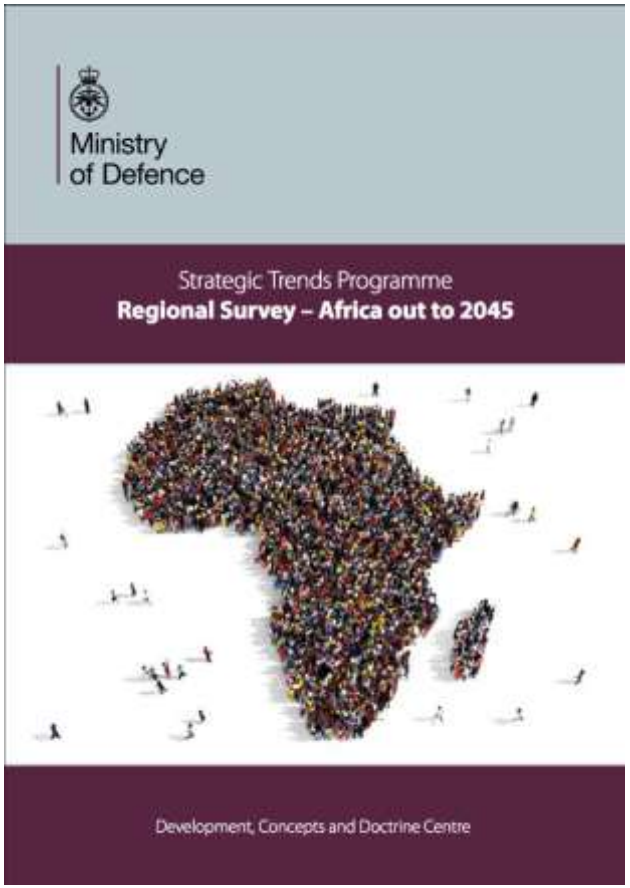


DCDC is the MOD's think-tank.

Strategic Trends Programme



Strategic Trends Programme - Products



The purpose of GST

"My sense of the MOD's Development, Concepts and Doctrine Centre, its product Global Strategic Trends…is that we are internationally competitive at being able to set out how the world is evolving over time. "

General Sir Richard Barrons
Former Commander of Joint Forces Command
Giving evidence to the Defence Committee

"Global Strategic Trends was one of the main contributions to the policy-making process that culminated in the 2015 UK strategy."

House of Commons briefing paper 7431

GST6 - Milestones

1. Project scoping and definition

GST6 Work Strands

Thematic

1. Environment (including climate change)
2. Resources, materials and waste
3. Food & water
4. Energy
5. Demography (ethnicity, migration & ageing)
6. The human habitat
7. The built environment (where we will live)
8. Globalisation & its impacts
9. The human race (health and augmentation)
10. Culture (identity, and cultural homogenisation)
11. Community & values (rights and relationships)
12. Work, lifestyle and leisure
13. Art, expression and design
14. Belief systems (including religion and ideology)
15. The global political order and governance
16. The role of the state, non-state actors and individuals
17. The global economic system (including money and value)
18. Trade
19. Inequality
20. Law, justice and ethics.
21. Conflict, violence and security
22. Crime and corruption
23. Artificial intelligence
24. Transport
25. Automation
26. Manufacturing
27. Education, knowledge and learning
28. Communications and information
29. Media
30. Biotechnology

Geographic

1. Indo-Pacific (including Oceania)
2. Central Asia
3. The Middle East
4. The High North (including the Arctic)
5. Africa
6. Europe
7. Russia
8. Oceans
9. Space
10. North America
11. Latin & Central America and the Caribbean
12. Antarctica & southern islands

Broad and shallow or deeper and narrow

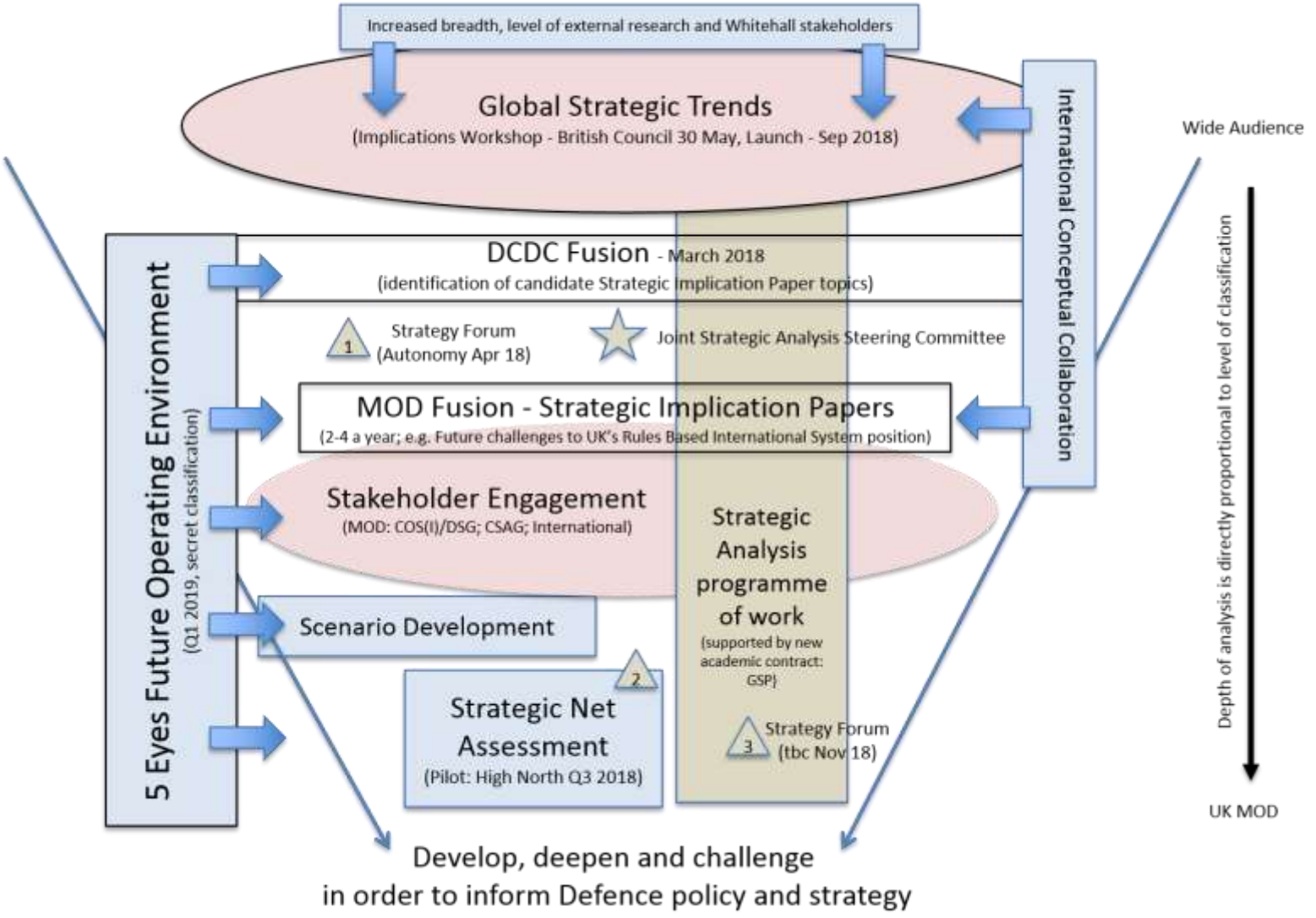
GST6 - Milestones

1. Project scoping and definition
2. Regional/National Engagement
3. Identification of research network
4. ‘Outsourcing’ to research network (~10,000 words per WS)
5. Workshop and reference group development
6. ‘Elements’ 4 pagers
7. ‘Clustering’
8. Editing and Publishing
9. Launch
10. Regional/National Engagement

Key Events

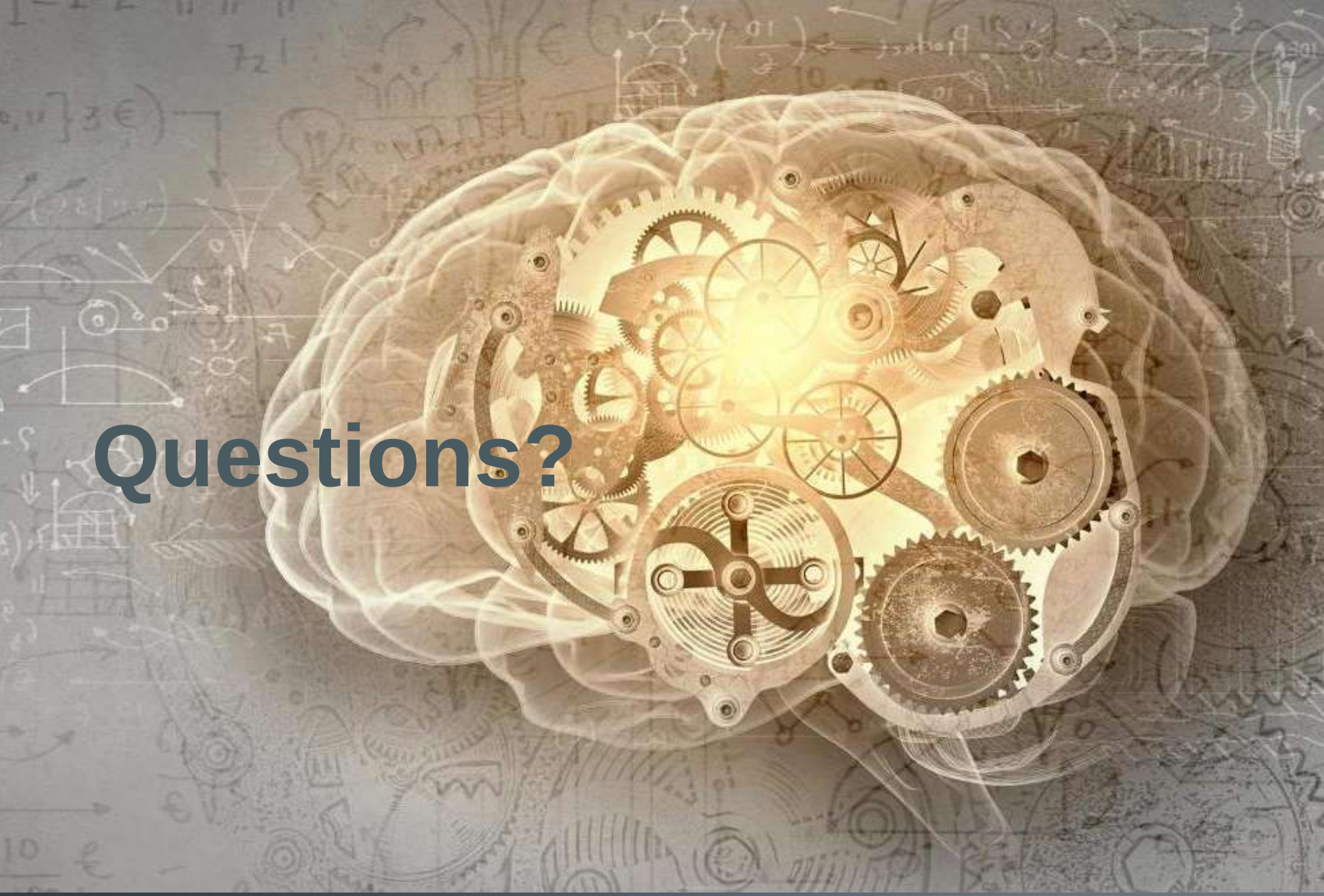
1. Launch Workshop (Oct 16)
2. Emerging Findings Event (Oct 17)
3. Implications Workshop (May 18)
4. Launch Event (Sep/Oct 18)

Strategic Analysis Programme - GST Exploitation



Personal observations after 12 months

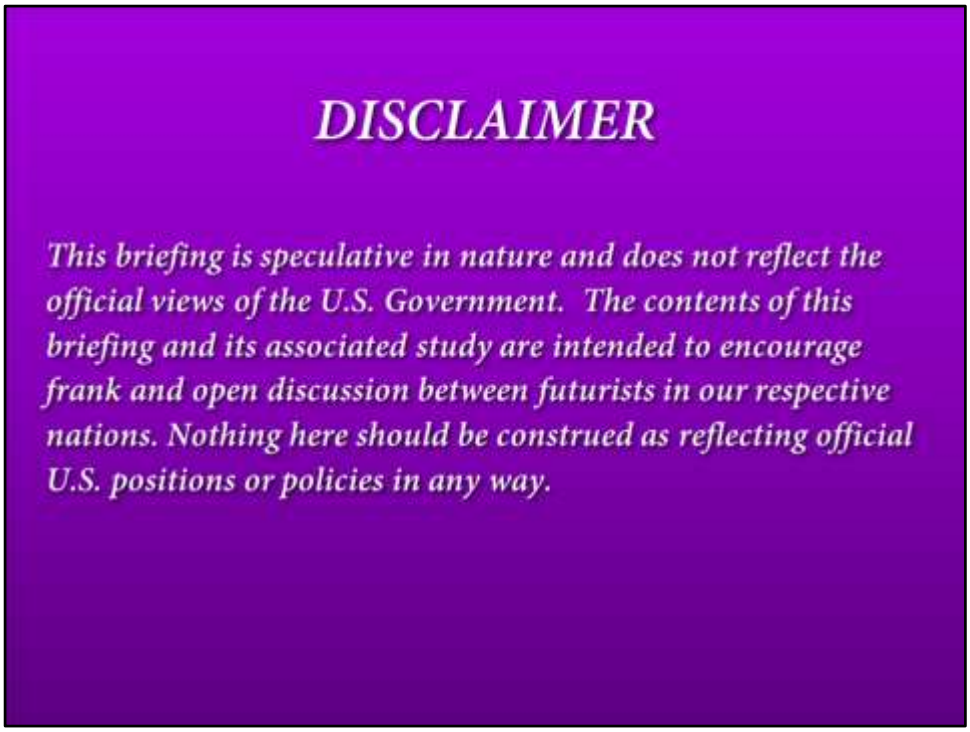
- Project or programme?
- Punchy or conservative?
- How do you create relevance?
- Reputation is important
- Discipline within process (red teaming/challenge)
- The working environment
- Lexicon and writing styles
- Horizon Scanning is not strategic foresight


Questions?

Good morning. I am Jeff Becker, the senior futurist with the Joint Concepts Division at the Joint Staff J-7. I'm here to talk to you over the next 45 minutes or so about a study we published in early April called "Challenged Assumptions and Potential Groupthink: Observations and Insights from International Deep Futures Collaboration."

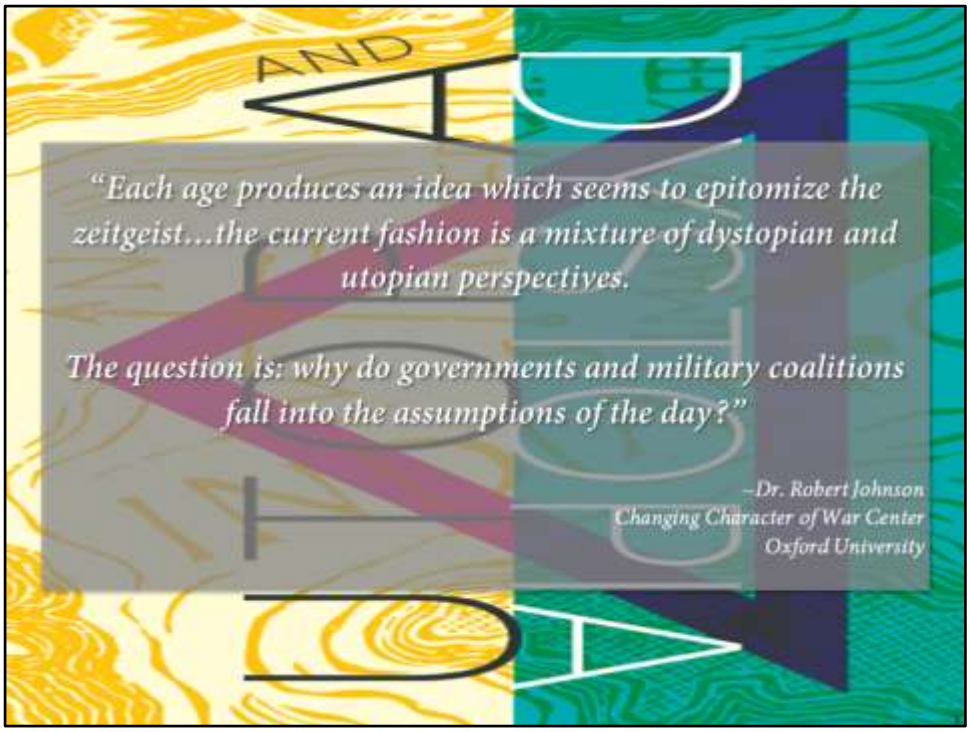
I believe this has been sent to you as part of the read-ahead for this conference, but this study builds from a workshop we held at the International Concept Development and Experimentation Conference in London last October.

During that event we asked nations to describe some of their assumptions and some of the more controversial assertions in their various future documents. After the event, we dug a little deeper and looked at how we may disagree – or agree too much – on issues…and some of the implications of those agreements and disagreements for our view of the military future.



A disclaimer– you can read the slide, but don't construe any of this as U.S. policy or an official view.

We were trying to tease out implications to take our mutual discussion down to another level of detail, so again these are the results of my own analysis of our respective documents, and the purpose is to get us to think even harder about what we believe future conflict and war might really be like.

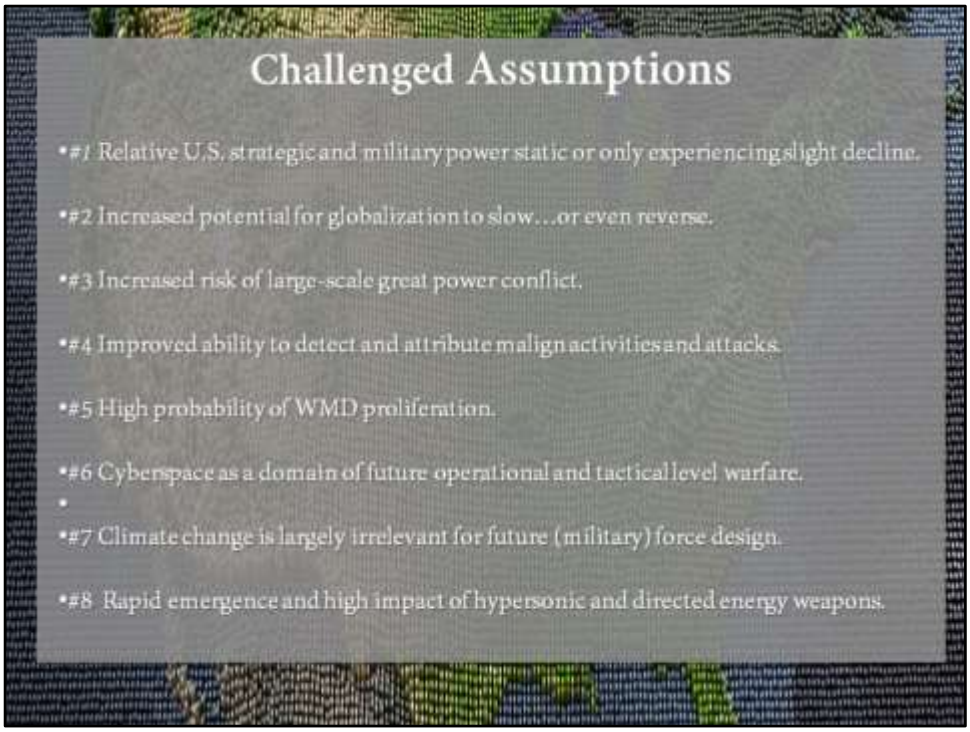


Many international partnerships seek consensus so that their armed forces understand the changing character of war and are thus, able to work together better. This study is the culmination of an effort to encourage *frank and open* disagreement among our partners about the nature – and implications – of strategic change for our military forces.

The study begins with eight "challenged assumptions." These are areas in which the U.S. view of an issue appears to be somewhat different from the way our allies and partners might see it. Again, this is general and impressionistic, but usually reinforced by a close read of respective futures documents. From there, we describe some broad implications of the assumption being either correct – or incorrect.

The second part of the study describes 10 areas of "groupthink" - that is, areas in which are views appear to be so similar that they may merit further examination.

We'll begin with the eight "challenged assumptions." Important here to note that we built this study based on – as nearly as we could convey them – the official views within your respective futures documents. As you are all well aware, there is a diversity of views within and across nations, and probably within this room, so as I go through these, lets focus NOT on the issues themselves – but for me, the important part of this exercise was to think about the various implications of these different perspectives for how we go about building and operating our future military forces.


Challenged Assumptions
•#1 Relative U.S. strategic and military power static or only experiencing slight decline.
•#2 Increased potential for globalization to slow…or even reverse.
•#3 Increased risk of large-scale great power conflict.
•#4 Improved ability to detect and attribute malign activities and attacks.
•#5 High probability of WMD proliferation.
•#6 Cyberspace as a domain of future operational and tactical level warfare.
•#7 Climate change is largely irrelevant for future (military) force design.
•#8 Rapid emergence and high impact of hypersonic and directed energy weapons.

[text]

From here, we'll move into the ten areas in which perspectives on the future are so similar that they may bear further examination. Groupthink is essentially the desire to not to stand out or to believe things because others appear to believe them. Groupthink is not necessarily bad, and has helped humans survive, but it may damage our objectivity and blind us to important issues – issues that may surprise us if we are not careful.

Just because we may all say the same thing does not necessarily mean that we are wrong, but to me a warning light goes off in my head. The point of these ten topics are to challenge us to think harder and deeper about them. So for each of these areas, I suggest a an "alternative view" – a way of looking at the issue to make sure there is not something that we have overlooked.

Alternative #1: *"Economic growth in the developing world has been illusory and few states transition to 'developed' status…"*
Alternative #2: *"Adversaries will reach technological parity with the West…"*
Alternative #3: *"Growth of loosely controlled, highly connected information technologies…"*
Alternative #4: *"Non-state actors are less able to organize and contest national authorities locally, regionally, or transregionally…"*
Alternative #5: *"2000-2020 represented a historic high point in global migration. The flow of migrants to the West will slow or reverse…"*
Alternative #6: *"States adjust to decolonization, globalization, and information technologies and establish new, legitimate forms in order and governance…"*
Alternative #7: *"People move to cities to find opportunity and are generally better off. Urban conflict is less likely than conflict between urban and rural areas…"*
Alternative #8: *"Greater dependence on information technologies means that military operations will prioritize the disruption of enemy sensors and finding ways to gain information advantage…"*
Alternative #9: *"Robotic systems remain ineffective or too costly to replace or significantly augment humans on the battlefield…"*
Alternative #10: *"The application of violence in conflict and war cannot be precisely controlled…"*

After spending a great deal of time with our collective documents, I'd like to leave you with several overall impressions.

First: Our futures studies appear to be strongly colored by fear of the loss of what was. We've been fortunate to possess major economic, technological, and ideological strengths during the Cold War – and have long legacy of military and industrial dominance with respect to other civilizations and states.

We were rewarded with a "strategic holiday" after the fall of the Soviet Union during which direct consequential military threats were few.

Today, we collectively face the explosive rise of Chinese influence – often predatory, renewed Russian risk-taking and aggression, North Korean single-mindedness, Iranian adventurism, and a roiling global insurgent and terrorist archipelago.

All make us uncomfortable and look to the stability of a bygone status quo. I think the pictures here capture a bit of tone that underlays our futures studies. Two paintings (from a series of five) by Thomas Cole (1833 -36) called *The Course of Empire*. "On the left – *Consummation of Empire*; on the right – *Destruction*. From a poem by Byron, that reads: "First freedom and then Glory – when that fails, Wealth, vice, corruption..."

Maybe we are a bit overwrought – which leads me to my second observation, that

Second: our collective emphasis on trends and the erosion of historical advantages perhaps underplays the nature of the competition and the "action/reaction"

character of military and strategic competition. Collectively we may need to consider the nature of competition more thoroughly going forward. To do this, our futures documents should more comprehensively break free from our collective angst over lost advantages and get back into the business of competing – together – against adversaries that have demonstrated the intent and purposeful force development efforts to undermine, subvert, isolate, intimidate and ultimately defeat us.

From the U.S. perspective, perhaps the most difficult part of looking into the future of conflict and war is understanding where we, as a nation and as a military force fit into the broader world – we hope interaction with the United States does the same for our allies and partners as well.

U.K. most strikingly the U.K. describes a 2045 China with an economy (measured at purchasing power parity) of more than double that of the United States ($62.9 trillion versus $30.7 trillion).

What if the U.S. is the (much) smaller superpower with respect to China?

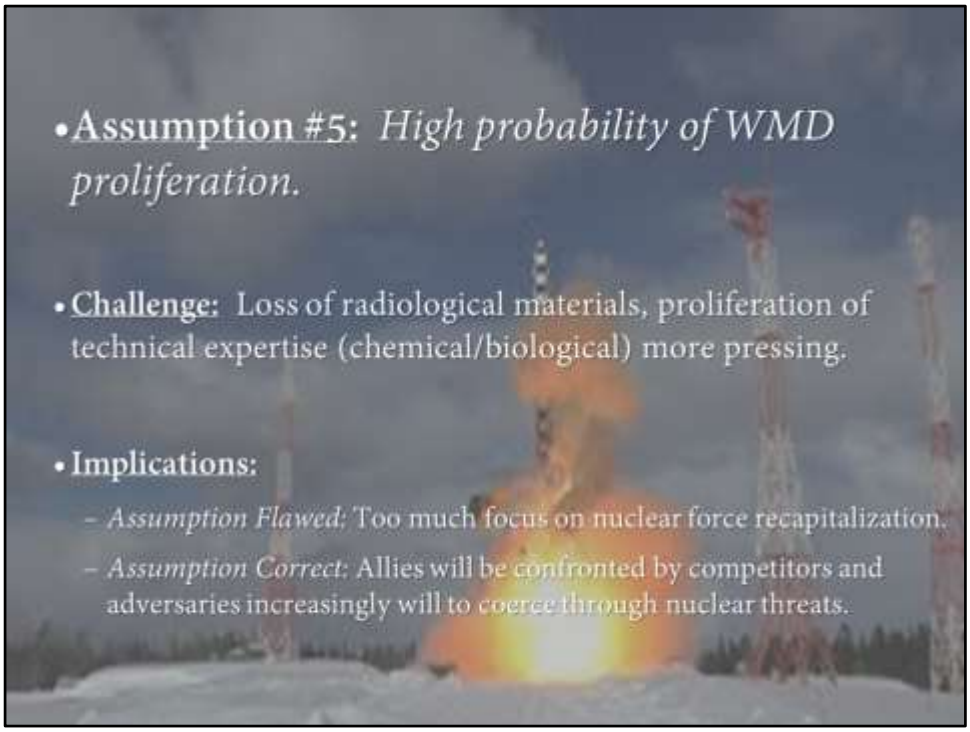
Many partner documents portray the reversal of globalization as an undesirable outcome based on strategic failure. The U.K. and NATO place this possibility in a contrarian text box within the larger narrative. The German *Strategic Foresight* study outlines this possibility in two scenarios – *Multipolar Competition* and *Multiple Confrontations* – in which a reversal of globalization substantially damages German security. E.g. "Globalization Backlash."

The U.S. tends to view this as an assumed condition – that is – that some increased stress on global rules and norms will (and is) occurring, and that military operations must adjust accordingly.

U.S. JOE describes the need to credibly demonstrate warfighting capabilities with respect to other great powers – both for deterrence purposes and to combat high-end military forces when necessary.

In contrast, allies and partners tend to cite Stephen Pinker's thesis that violence is declining and that war among states may be increasingly obsolete. In the case of the allies, great power conflict is frequently seen as more limited or subversive in nature, rather than full scale combat among conventional military forces.

Describes the need for future joint forces to "*identify ideological networks and properly classify their motivations, structures and relationships*," to "*enable discrete applications of lethal strikes and protective defensive efforts*." The JOE emphasizes "new data interrogation techniques [which] will enable better understanding of patterns and permit large-scale inferences about the behaviors of societies by analyzing geographic data, purchasing and financial information, and other relevant information." The U.S. views attribution as a problem to be worked, rather than a condition of the future operating environment. U.S. *Joint Operating Environment 2035* (July 2016), p. 19 & 42.



One caveat - NATO's *Strategic Foresight Analysis* still calls nuclear weapons "*a core component of NATO's overall capabilities for deterrence and defense*."

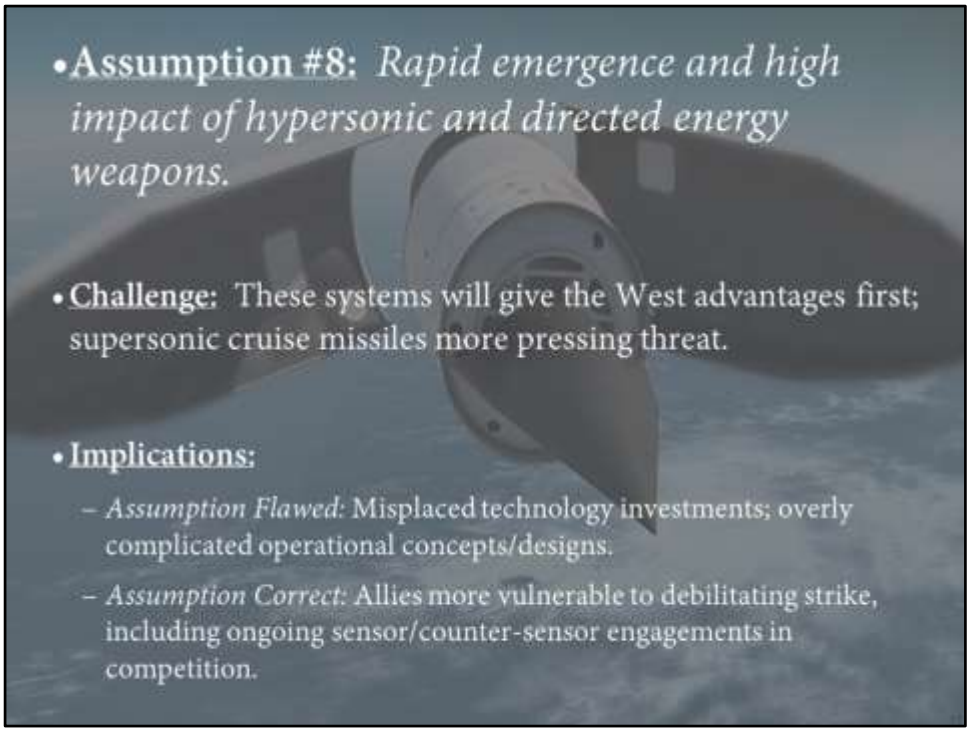
-also, adversaries will be less ready to confront, deter, and defend against adversaries integrating nuclear weapons and capabilities into force and operational design.

- **Assumption #6:** *Cyberspace as a domain of future operational and tactical level warfare.*

- **Challenge:** Threats to civilian infrastructure and espionage most important threats from potential adversaries.

- **Implications:**
  - *Assumption Flawed:* U.S. may over-estimate the military effect of cyber operations and neglect homeland and allied national cyber defenses.
  - *Assumption Correct:* Allies may neglect to understand chipset-level vulnerabilities and impact of EMP and laser systems against computer controlled weapons and platforms.

The military priority and warfighting implications of climate change vary widely between the JOE and other futures. The U.S. view focuses on climate as one of many factors that contribute to political and social disorder. The JOE describes a future in which "*states [are] unable to cope with internal political fractures, environmental stressors, or deliberate external interference*." Moreover, the U.S. sees any military response to climate change as less direct, with future force design focused on warfighting. The U.S. places a very low priority on the use of military forces to mitigate climate challenges.


• Assumption #8: Rapid emergence and high impact of hypersonic and directed energy weapons.
• Challenge: These systems will give the West advantages first; supersonic cruise missiles more pressing threat.
• Implications:
– Assumption Flawed: Misplaced technology investments; overly complicated operational concepts/designs.
– Assumption Correct: Allies more vulnerable to debilitating strike, including ongoing sensor/counter-sensor engagements in competition.

Groupthink #1?

"Developed economies will lose ground to the developing world…"

Alternative View

"Economic growth in the developing world has been illusory and few states transition to 'developed' status…"

Groupthink #2?

"Adversaries will reach technological parity with the West…"

Alternative View

"The U.S. and its partners will retain a significant technological lead…moreover they are culturally and organizationally better postured to adapt technological advances for military purposes…"


Groupthink #3?
"Growth of loosely controlled, highly connected information technologies…"
Alternative View
"States gain increasing control of the information space and strictly monitor, regulate, and influence how devices connect and information flows through their networks…"


Groupthink #4?
"Non-state actors will be more effective and deadly…"
Alternative View
"Non-state actors are less able to organize and contest national authorities locally, regionally, or transregionally…"


Groupthink #5?
"Population growth and inequality drive persistent migration to the West indefinitely…"
Alternative View
"2000-2020 represented a historic high point in global migration. The flow of migrants to the West will slow or reverse…"


Groupthink #6?
"More failed and failing states will fragment and collapse – contributing to ongoing international instability…"
Alternative View
"States adjust to decolonization, globalization, and information technologies and establish new, legitimate forms in order and governance…"


Groupthink #7?
"Urbanization will accelerate and increase conflict in cities…."
Alternative View
"People move to cities to find opportunity and are generally better off. Urban conflict is less likely than conflict between urban and rural areas…"

Groupthink #8?

"Information will be as important as physical actions in warfare…"

Alternative View

"Greater dependence on information technologies means that military operations will prioritize the disruption of enemy sensors and finding ways to gain information advantage…"


Groupthink #9?
"Militaries will field more numerous, capable, and effective robotic and autonomous systems…"
Alternative View
"Robotic systems remain ineffective or too costly to replace or significantly augment humans on the battlefield…"

Attempts to 'message' through violent action are more likely to be misunderstood, escalate, and lead to unintended consequences.