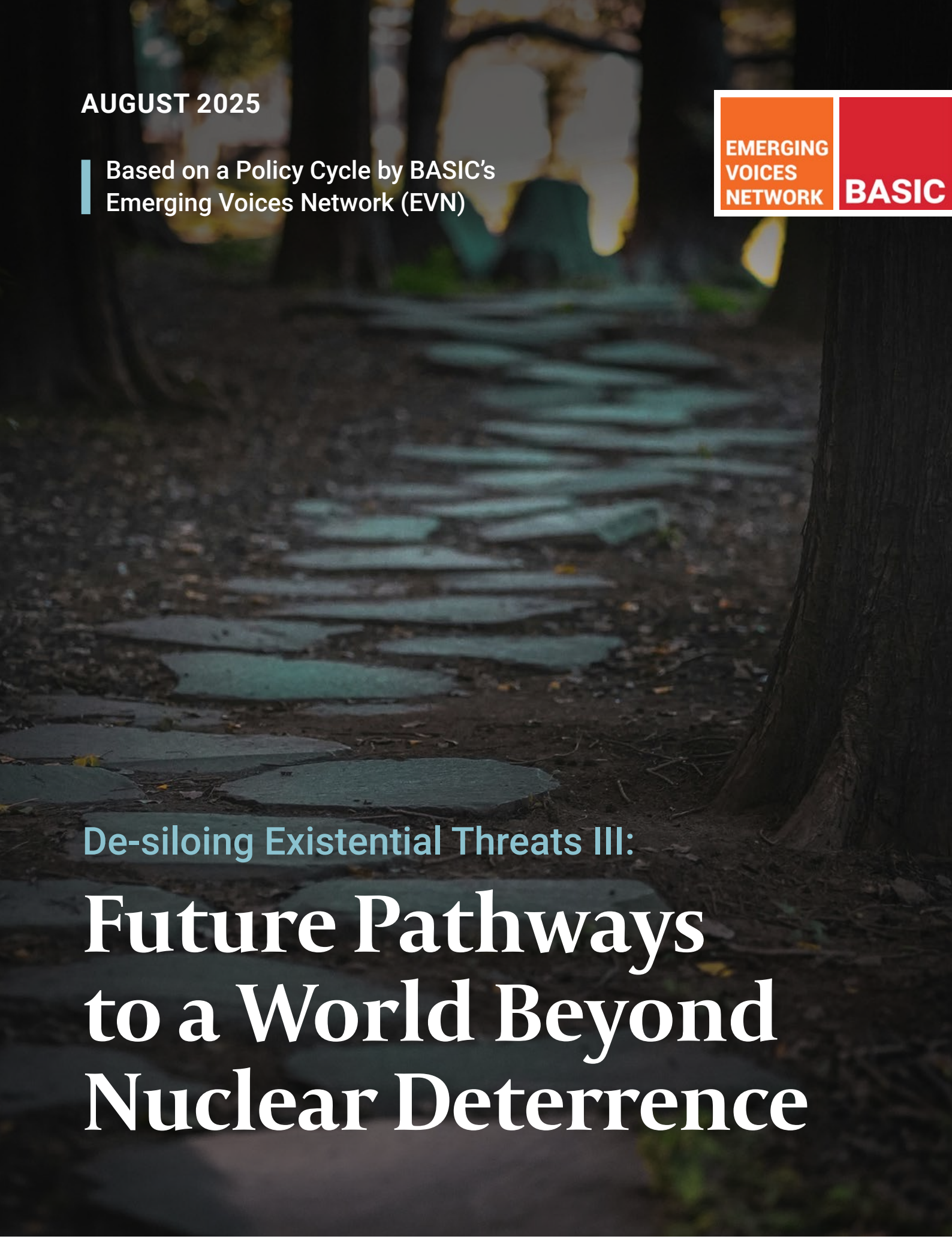

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Based on a Policy Cycle by BASIC's Emerging Voices Network (EVN)

EMERGING VOICES NETWORK BASIC

De-siloing Existential Threats III:

Future Pathways to a World Beyond Nuclear Deterrence

Declan Penrose

HORIZON 2045

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BASIC

BASIC is an independent, non-profit think tank working to safeguard humanity and Earth's ecosystem from nuclear risks and interconnected security threats for generations to come. We have a global reputation for convening distinctive, empathic dialogues that help states overcome complex strategic and political differences. Our established networks and expertise, developed since 1987, enable us to get the right people in the room and facilitate effective, meaningful exchange between siloed and often hostile political communities.

Emerging Voices Network

Launched in December 2020, the Emerging Voices Network (EVN) is a digital network of high-potential, next-generation leaders on nuclear issues who will inherit the responsibility of managing nuclear threats. In founding the EVN, BASIC's aim was to create a truly inclusive digital space wherein younger voices from marginalised communities around the world are heard on nuclear issues. The network promotes collaboration, dialogue and bridge-building between next-generation leaders from the Global North and South, with diversity and inclusivity at the forefront of the Network's ethos and mission.

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Contents

Introduction

> BASIC's Emerging Voices Network (EVN) seeks to reach, engage, and platform early career and young experts from around the globe.

As part of the recruitment and selection process, the EVN ensures a high proportion of members are from communities, countries, and backgrounds that are typically underrepresented in mainstream nuclear policy fora. The EVN is committed to helping these individuals overcome institutional barriers to ensure that those spaces are truly global. The EVN also seeks to ensure that the perspectives and expertise of communities that are often minoritised – yet crucially impacted by nuclear weapons development and policy – are centred and integrated into mainstream nuclear dialogue.

In January 2025, the EVN launched the third phase of our policy cycle series on "de-siloing" the nuclear policy field, supported by Ploughshares. In the previous two phases, we first focused on de-siloing the nuclear field by highlighting marginalised subject matters and then focusing on the connections between nuclear weapons and other existential threats. We wanted to think ahead for our third phase and imagine pathways to a more peaceful and stable future. This policy cycle sought to utilise foresight methodologies with our EVN members to imagine multiple future pathways to a world beyond nuclear deterrence. We then used these pathways to develop policy recommendations to help the nuclear field work towards a desirable future while mitigating the risks that could lead to undesirable futures.

Today, it is difficult to imagine the abolition of nuclear weapons. Tensions are rising between adversaries. Nearly all nuclear states are modernising and/or expanding their nuclear arsenals.[1] Russia, a nuclear state, has invaded Ukraine, a non-nuclear state, and has made repeated nuclear threats to dissuade others from providing military assistance to Ukraine.[2] The second Trump Administration has so far been even more unpredictable than the first, and its allies are less confident they can rely on the US nuclear umbrella.[3] The New START Treaty between the US and Russia is due to expire in February 2026. During the writing of this report, both Israel and the US attacked Iran citing fears they were developing a nuclear weapon, yet they failed to destroy Iran's nuclear programme and there are fears that this has punished them closer to developing a bomb.[4] Yet these challenges should not mean that we should abandon hope of a world free of nuclear weapons. It should encourage us to increase our efforts to eliminate the threat of nuclear war once and for all.

1 "Nuclear risks grow as new arms race looms—new SIPRI Yearbook out now", *SIPRI*, (2025) https://www.sipri.org/media/press-release/2025/nuclear-risks-grow-new-arms-race-looms-new-sipri-yearbook-out-now.

2 Patricia Lewis, "How likely is the use of nuclear weapons by Russia?", *Chatham House*, (2022) https://www.chathamhouse.org/2022/03/how-likely-use-nuclear-weapons-russia.

3 Ian Langford, "Why Donald Trump has put Asia on the precipice of a nuclear arms race", *The Conversation*, (2025) https://theconversation.com/why-donald-trump-has-put-asia-on-the-precipice-of-a-nuclear-arms-race-256577.

4 Edwin Lyman, "Iran can still build nuclear weapons without further enrichment. Only diplomacy will stop it", *Bulletin of the Atomic Scientists*, (2025) https://thebulletin.org/2025/07/iran-can-still-build-nuclear-weapons-without-further-enrichment-only-diplomacy-will-stop-it/#post-heading.

With this in mind, the EVN Programme organised a workshop-based policy cycle for EVN members to develop their understanding of these issues and use this to inform policy recommendations for states, Non-Governmental Organisations (NGOs), and civil society. This policy cycle envisions various potential roadmaps to a world beyond nuclear deterrence, aiming to understand the many ways this could be achieved, and to encourage a more favourable pathway.

Workshop 1

The first workshop started with a reflection on the previous two policy cycles of the desiloing series. We then moved on to our first exercise, where the focus groups were tasked with answering the question "What do you believe will be the primary drivers that could lead to a world beyond nuclear deterrence?". To answer this question, the focus groups used the foresight tool futures wheels. Futures wheels are designed to enable a group to explore the immediate and second-order consequences of change, and to visualise it.[5] In our first futures wheel, we thought chronologically about the consequences of moving towards a world beyond nuclear deterrence. In our second futures wheel, we used a different version of the tool to think about drivers and consequences across multiple security domains. This included individual, national, regional, global, and planetary. By the end of the workshop, each focus group had a range of drivers which would be used to kick-start their scenarios in the following workshops.

Workshop 2

In the second workshop, the drivers identified in the previous workshop were used to inspire and begin their visions of the future, utilising the 'scenario development' foresight tool. Futures wheels are often paired with scenario development to inform scenarios.[6] Participants were tasked with thinking about the impacts of their chosen drivers and how these drivers may interact with each other to shape their scenarios. They also identified the critical uncertainties and the role they could play in shaping favourable and unfavourable future pathways to a world beyond nuclear deterrence. Here, they began to turn their initial ideas into a deeper exploration of a sequence or combination of events that could take place in the future in the medium-to-long term.

Workshop 3

In the third workshop, the focus groups continued to develop their scenarios using 'visioning'. Visioning is often utilised by policy makers and businesses to develop a preferred or desirable future by focusing on a common set of aims and objectives.[7] A positive vision encourages stakeholders to achieve their shared goals and delves into specific details to help create a detailed image of the future. The focus groups were tasked with applying this methodology to further envision their favourable and unfavourable future scenarios for a world beyond nuclear deterrence. They were also asked to identify the points of convergence between their favourable and unfavourable scenarios. This was to help them find key points of divergence to help strengthen their policy recommendations in directing us down a favourable future pathway. When utilising visioning in foresight methodologies, you must imagine ahead and plan backwards to get to, or avoid, an imagined future. This is known as 'Presencing'.[8]

5 Andrew Curry, "Futures tools", *School of International Futures*, (2023) https://soif.org.uk/blog/futures-tools/.

6 José Manuel Roche, *The Future Is Ours: Strategic Foresight toolkit – making better decisions*, (2019, London: Save the Children UK) p.22.

7 José Manuel Roche, *The Future Is Ours: Strategic Foresight toolkit – making better decisions*, p. 79.

8 "Strategic Foresight: Stage 4 – Visioning a Preferred Future", *Hillbreak*, (2017) https://www.hillbreak.com/conducting-corporate-foresight-part-4-of-6/.

Workshop 4

The fourth workshop saw the focus groups turn their future scenarios into pathways using 'Roadmapping'. Roadmapping is a framework and approach that integrates multiple perspectives relevant to a policy or project – including 'what needs to be done', 'why is it needed' ('pull') and 'how it is to be achieved' ('push'), all mapped against time ('when') – often in a visual, easy to communicate format.[9] The focus groups were tasked with visualising the pathways to their favourable and unfavourable scenarios. This would help them to identify the key actions required to move towards these scenarios, and crucially, when these steps should be taken chronologically. For both scenarios, they were told to think as if they were deliberately aiming to make them a reality. The resulting pathways would help them to decide which steps need to be taken early and which should be left until later. This helped them to finalise their scenarios in preparation for developing their policy recommendations.

Workshop 5

The fifth and final workshop saw the focus groups work towards finalising their scenarios, notes, and policy recommendations. They were tasked with bringing together everything they had discussed over the previous four sessions and using this and their future scenarios to create policy recommendations. They were provided with guidance on how to create clear, concise recommendations that policymakers and key stakeholders could understand and realistically implement. Their final workshop notes and policy recommendations were used to inform this report.

9 Emma Griffiths, "The role of Roadmapping in the Futures Toolkit", *Government Office for Science*, (2019) https://foresightprojects.blog.gov.uk/2019/10/17/the-role-of-roadmapping-in-the-futures-toolkit/.

FOCUS GROUP ONE

Reimagining Security: Fostering a Human-Centred, Diverse, and Stable Security Paradigm

GROUP MEMBERS:

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Emily Faux
Philipp Fischer
Wandile Shezi

Focus group one (FG1) sees nuclear deterrence not just as a military strategy but as a cultural paradigm in international security.

They argue that education, political campaigns, and propaganda have constructed possessing nuclear weapons not just as legitimate, but also necessary for great powers to prevent war. In the view of FG1 we are currently in a realist security paradigm.[10] In the minds of state leaders, nuclear policymakers, and strategists, security is often equated with nuclear deterrence and military capability, reducing it to a zero-sum contest of perpetual competition. In times of tension between adversaries, states typically respond in-line with this thinking by focusing on strengthening their military capabilities and arms racing. FG1 argue that this results in a world where deterrence through the threat of annihilation is portrayed as the ultimate guarantor of international stability. This logic is prioritised over the concepts of human and ecological security, stopping us from creating a new paradigm that centralises these concepts. According to UN General Assembly resolution 66/290, Human Security is an approach to assist Member States in identifying and addressing widespread and cross-cutting challenges to the survival, livelihood and dignity of their people."

It calls for "people-centred, comprehensive, context-specific and prevention-oriented responses that strengthen the protection and empowerment of all people."[11] FG1 argues that the current paradigm instead treats credibility as the sole metric of deterrence and neglects both ethical considerations and alternative approaches.

The group believes that the global nuclear order is run by power and privilege. Nuclear-Weapon States (NWS) carry the legal duty to eventually disarm, yet continue to maintain, modernise, and even expand their nuclear arsenals. They still rely on the silent threat of mass destruction for their security and to keep their status as a nuclear power.[12] This means that it is only the nuclear weapons states that have full agency regarding nuclear weapons. The non-nuclear-weapon states (NNWS) cannot force the NWS to disarm. The NPT, for example, requires an agreement by consensus on substantive matters.[13] This arrangement renders NNWS almost powerless to bring about disarmament and has resulted in gridlock in Nuclear Non-Proliferation Treaty (NPT) Review Cycles and other forums. Instead, NNWS have had to attempt to stigmatise and delegitimise nuclear weapons by negotiating the Treaty on the

10 Realism believes the insecurity of states as the main problem in international relations. It portrays the international system as an anarchical realm where states must look after themselves and prioritise self interest and survival. States must provide security for themselves because no other actor can be relied on to do so. See Stephen M. Walt, "Realism and Security", in Robert A. Denemark and Renée Marlin-Bennett (eds), *The International Studies Encyclopedia*, (2010, Hoboken, N.J.: Wiley-Blackwell).

11 United Nations General Assembly (UNGA), "Resolution adopted by the General Assembly on 10 September 2012" (2012) UN Doc A/RES/66/290. https://docs.un.org/en/%20A/RES/66/290.

12 Jana Baldus, Harald Müller, and Carmen Wunderlich, "The global nuclear order and the crisis of the nuclear non-proliferation regime: Taking stock and moving forward", *Z Friedens und Konfliforsch*, 10, (2021) pp. 195-218 (pp. 197).. https://link.springer.com/article/10.1007/s42597-021-00066-0.

13 Rule 28, NPT/CONF.2020/1, Annex III, 20 May 2019.

Prohibition of Nuclear Weapons (TPNW) and Nuclear-Weapon-Free Zones (NWFZ).[14]

> **FG1 were also deeply concerned with the power of the Military Industrial Complex (MIC) as a structural issue, and questions of how to diminish its influence.**

They were concerned with the economic and political power of the MIC and its ability to encourage states to emphasise military might over diplomacy and socioeconomic investments. Despite President Dwight D. Eisenhower's warning over half a century ago,[15] the MIC today is more powerful than ever. In the US, on average per year, each taxpayer spends $1,087 on weapons contractors compared to just $270 for K-12 education.[16]

When thinking about normative understandings of nuclear weapons, FG1 draws on Foucault's observation that what a society accepts as "truth" or common sense is enforced and negotiated through discourse, education, and institutions, meaning that the dominant ideas are constantly reinforced but also open to change.[17] FG1 applies this understanding of truth to nuclear weapons and believes its policy recommendations can help to change current understandings of nuclear deterrence. For example, in the recently published 2025 UK Strategic Defence Review, the UK nuclear deterrent is referred to as "the cornerstone" of and provides "critical insurance" for UK and global security.[18] FG1, like Carol Cohn, are also critical of how nuclear weapons have been portrayed by deterrence proponents, such as referring to them as "clean bombs", and a "rational" part of security strategy.[19] They argue that accounts which only focus on the role of nuclear weapons in preventing war overlook the devastating consequences any scale of nuclear conflict would cause.[20]

FG1's final favourable scenario begins with increasing support from the public for nuclear disarmament and more states joining the TPNW by 2030. NNWS significantly improve their relations, and the combined pressure of public and NNWS disarmament campaigning ramps up pressure on the NWS. The Global South NNWS come together and coordinate their disarmament efforts. This results in more discussions on reducing everything related to nuclear weapons, including delivery vehicles, warheads, and fissile material at tracks 1.5 and 2 levels. This is soon followed by track 1 level dialogues. Furthermore, the disarmament movement increases its efforts to educate the public on nuclear harms from all stages of the nuclear weapons lifecycle. This further builds the pressure on the NWS to disarm as the issue becomes a priority for the public, civil society, and NNWS.

By 2035, all states have ratified the TPNW and this push towards disarmament forces the agenda onto the UN Security Council. While this universal ratification has not immediately abolished all nuclear weapons, states are working collaboratively with civil society to develop research on practical steps towards disarmament and new verification methods. Steps have also been taken to map out existing nuclear weapons arsenals as the NWS move towards transparency. Furthermore, states and civil society begin collaborating to create a new security paradigm that does not rely on nuclear deterrence.

In 2035-40, concrete pathways towards a world without nuclear weapons are developed. Plans to dismantle arsenals are made alongside robust measures to enforce compliance and irreversibility through strong verification methods. The mass movement towards nuclear disarmament among the public is now too powerful to stop, pushing the NWS to engage with the process in good faith.

14 Sverre Lodgaard, "Arms Control and World Order", *Journal for Peace and Nuclear Disarmament*, 2(1), (2019) pp. 1-18 (p. 3).

15 Dwight D. Eisenhower, "President Dwight D. Eisenhower's Farewell Address", (1961), The Oval Office, the White House. https://www.archives.gov/milestone-documents/president-dwight-d-eisenhowers-farewell-address.

16 Ben Freeman and William Hartung, "The Military-Industrial Complex Has Never Been Worse", *Jacobin*, (2023) https://jacobin.com/2023/05/military-industrial-complex-pentagon-budget-weapons-manufacturing-influence-revolving-door.

17 Michel Foucault, in Paul Rabinow (ed) *The Foucault Reader: An Introduction to Foucault's Thought*, (1991, London: Penguin).

18 Ministry of Defence, *The Strategic Defence Review 2025 Making Britain Safer: secure at home, strong abroad*, (2025) https://www.gov.uk/government/publications/the-strategic-defence-review-2025-making-britain-safer-secure-at-home-strong-abroad.

19 Carol Cohn, "Sex and Death in the Rational World of Defense Intellectuals".

20 Syeda Batool et al. Limited War, Unlimited Consequences:"Integrating the Global Environmental Impact of Nuclear Conflict into Contemporary Deterrence Thinking" in Dave Cullen (ed) *Nuclear Harm Reduction: A Policy Cycle by BASIC's Emerging Voices Network (EVN)*, (2025) https://basicint.org/nuclear-harm-reduction-anthology/.

Furthermore, NNWS begin considering economic sanctions against NWS if they fail to take meaningful steps towards disarmament. This means that by 2045, all nuclear weapons had been disarmed. Furthermore, the world has faith that this was the case thanks to new verification measures. These measures help ensure the irreversibility of disarmament.

In FG1's unfavourable scenario, there is a decrease in public interest in 2025-30 as geopolitical tensions continue to rise and states turn to deterrence to feel safe. Arms control agreements continue to expire, and states unratify other treaties such as the Comprehensive Test Ban Treaty (CTBT). Many states that have signed treaties, such as the TPNW, do not move to ratify them. As distrust between states rises, diplomacy takes a back seat and international organisations struggle to cope. The fear of nuclear proliferation rises as the NWS continue to modernise and increase their arsenals. The MIC gains significant power and influence and uses this to further persuade states to increase their military capabilities.

By 2035, any momentum behind the TPNW has ground to a halt. Even more resources are being spent on nuclear weapons, and the world is feeling increasingly insecure. This further drives the fears of nuclear proliferation as more states consider the option of acquiring nuclear weapons, placing the non-proliferation regime under serious threat. International transparency and communication start to break down, and by 2040, states begin to withdraw from the TPNW, and nuclear proliferation begins. The TPNW becomes seen as a relic of more hopeful times as the number of nuclear weapons and NWS increases. Deterrence has become further entrenched as the cornerstone of international security, and adversaries rarely engage in meaningful dialogue.

Sometime between 2040 and 2045, roughly 100 years after the previous use of nuclear weapons in the Second World War in Japan, they are used again. The circumstances and scale of use are not clear, but the results are devastating. As growing mistrust and tensions place the world on the brink of a third world war, nuclear weapons are used.

A horrific nuclear winter is triggered, its effects compounding the indiscriminate lethality of the nuclear detonations. The devastation is hard to quantify and only now does the world realise that nuclear weapons should not exist.

FG1's first policy recommendation theme is on driving a normative shift to reimagine security in terms of collective resilience, human rights, and ecological well-being. In their envisioned pathways to a world beyond nuclear deterrence, their favourable future saw this normative shift occur. In their favourable scenario, state-centric deterrence was replaced with a human-centred security paradigm that emphasises individual and collective rights to health, dignity, and ecological stability.

They also believe that governments should foster pluralistic, anticipatory knowledge systems that utilise foresight methodologies. Berenike Prem argues that the emergence of anticipatory norms in security "hinges on forward-looking epistemic practices that produce and sustain knowledge about future governance objects and create a demand for preventive action".[21] Governments, therefore, should embrace these practices in their policymaking and fund research into these methods, including foresight methodologies. They also advocate for challenging nuclear deterrence on a normative level in society through education and advocacy that focuses on fostering peace and a shared sense of security. There are already examples of such education, for example from organisations such as Highly Nriched and Senzatomica, who seek to provide educational materials for young people that challenge the nuclear status quo.[22]

21 Berenike Prem, "Governing through Anticipatory Norms: How UNIDIRConstructs Knowledge about Autonomous Weapons Systems", *Global Society*, 36(2), (2022) pp. 261–280 (p. 262) https://www.tandfonline.com/doi/full/10.1080/13600826.2021.2021149#abstract.

22 Highly Nriched website https://highlynriched.com/; Senzatoimica website https://senzatomica.it/.

Their second policy recommendation theme is on nuclear governance. To change nuclear governance for the better and aid progress towards disarmament obligations, FG1 propose an enforceable nuclear disarmament framework with independent verification. Verification measures played a key role in their favourable scenario on the pathway to total nuclear disarmament. Furthermore, they call for a diverse governance system that includes all stakeholders, including youth, indigenous communities, and civil society. In their final favourable scenario, they found that NNWS and civil society took a leadership role and drove the path to the end of nuclear weapons.

Their third theme was on nuclear weapons and economics. Specifically, on addressing the role of the MIC. These policy recommendations are designed to drastically rebalance government military and social spending. In their unfavourable scenario, the MIC encouraged military spending and arms racing. Furthermore, their recommendations to Civil Society on this matter encourage them to educate the public on the money being spent on military and the MIC, and on how this money could be spent instead to improve their lives. As an example of this approach, in 2016, the Campaign for Nuclear Disarmament (CND) in the UK produced a 'People not Trident' report that lays out an economic case against the upcoming Trident nuclear weapons system replacement.[23]

Their fourth policy recommendation topic seeks to shift and develop sociocultural understandings of nuclear weapons and deterrence. Their recommendations are designed to tackle nuclear deterrence as a cultural challenge, build a societal consensus that nuclear weapons are morally abhorrent and strategically unnecessary, and replace this deterrence culture with one grounded in peace, justice, and shared security. In their favourable scenario, increased public interest and knowledge on nuclear weapons help to drive a revival of the disarmament movement.

FG1 also chose to tackle the real-world consequences of a nuclear war as their fifth theme. In their favourable scenarios, there was a fundamental shift in how nuclear weapons are discussed and understood. Nuclear discourse moved beyond strategic abstractions and acknowledged the catastrophic humanitarian, environmental, and climatic consequences of any nuclear use. FG1 believe it is important that the public understand that both regional and global nuclear conflicts would have far-reaching effects for all of humanity, regardless of borders or alliances.

Their final recommendation theme was on diplomacy. They believed change was necessary in the role of "South-South"[24] diplomacy to encourage a positive future beyond nuclear deterrence. Currently, and in their unfavourable visions of the future, the Global South is divided and fragmented.

> **Focus Group 1 seek to encourage global south states to cooperate and help drive the world towards nuclear disarmament and human-centred security.**

23 'People not Trident', *CND*, (2016) https://cnduk.org/wp-content/uploads/2018/02/People-not-Trident-2016.pdf.

24 "South-South" cooperation refers to the countries of the global south collaborating due to their shared experiences and sympathies, based on their common objectives and solidarity. South-South cooperation for development involves two or more developing countries pursuing their individual and/or shared national objectives through exchanges of knowledge, skills, resources and technical know-how and through regional and interregional collective actions To read more, see: "About South-South and Triangular Cooperation", *United Nations Office for South-South Cooperation*, https://unsouthsouth.org/about/about-sstc/.

FOCUS GROUP ONE

Policy Recommendations

FG1 made the following policy recommendations, which can be categorised into six themes: (i) Security Paradigm, (ii) Governance, (iii) Economics, (iv) Sociocultural, (v) Confronting the Real-World Consequences, and (vi) Diplomacy.

I. Security Paradigm

The group urges **states** to:

- Encourage the implementation of humanitarian impact indicators as part of the national reports submitted at the Review Conferences of the NPT. NNWS should develop and present a working paper introducing a "Humanitarian-Impact Annex" (HIA) template on the use of nuclear weapons with indicators such as victim-assistance and environmental-remediation metrics to be submitted by all States alongside their usual national reports at the NPT RevCon. Emphasise the HIA's as a transparency and confidence-building measure, and encourage NWS and allies under 'nuclear umbrella' treaty arrangements to reflect and provide specific information on the financial, health, and environmental burden of the deterrence logic. Request that the United Nations Office for Disarmament Affairs (UNODA) maintain an online repository.

II. Governance

The group urges **states** to:

- Advocate for the restructuring of the United Nations Security Council to rectify longstanding power imbalances in favour of the P5 and underrepresentation of regions such as Africa, Latin America, and Asia.
- Support the intergovernmental negotiations on the question of equitable representation on, and an increase in, the membership of the Security Council, and the elimination of the veto power of permanent members.
- Launch regional nuclear risk resilience centres and research centres, particularly in Africa, Latin America, and Southeast Asia.
- Promote the universalisation of a weapons of mass destruction-ban, including nuclear weapons. Such a treaty would form a clear definition of what constitutes a weapon of mass destruction, and universally ban them. States should actively promote the norm consolidation of a WMD ban by highlighting synergies and complementarities in the treaty architecture. This would involve collaborating with international bodies such as UNODA, the Organisation for the Prohibition of Chemical Weapons (OPCW), the International Atomic Energy Agency (IAEA), and the Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO) to identify incentive gaps in accession holdups.

III. Economic

The group urges **states** to:

- Establish a transparency initiative for nuclear weapons spending. NNWSs should research the full costs of NWSs' nuclear arsenals and launch a high-profile public-awareness campaign to highlight these figures. At the same time, independent expert bodies must be commissioned to model the long-term financial burden of sustaining nuclear deterrence, projecting maintenance, modernisation, and decommissioning costs over the coming decades. These cost projections should then be set beside alternative spending scenarios, showing how diverting even a fraction of the nuclear budget could vastly improve environmental protection programmes, shore up universal healthcare systems and strengthen social security nets.

The group urges **civil society** to:

- Coordinate public awareness campaigns to centre the humanitarian impact of the nuclear doctrine in the discourse of developing countries. They should promote the understanding of the economic burden created by States' reliance on defence-related industries to mobilise public discourse around the opportunity costs of militarisation to build pressure for divestment from the MIC and reinvestment in Sustainable Development Goals (SDGs). Through regional and international coalitions, they should also promote the inclusion of the impacts of militarisation to achieve the SDGs in the international agenda and all fora to ensure these links are addressed as systemic barriers to sustainable peace and development.

IV. Sociocultural

The group urges **states and cultural industries** to:

- Promote education on nuclear issues. National education authorities should undertake a thorough curriculum review, aiming to embed accurate and non-biased histories of nuclear development alongside intercultural modules that foster empathy for other countries' ideologies, religions, and experiences of harm from nuclear weapoms. Together with civil-society partners, they should formalise a global coalition to run a sustained public-education campaign, leveraging social and traditional media to de-legitimise nuclear deterrence and elevate human-rights and human-security frames, measuring progress through shifts in public opinion, curricular adoption rates, and levels of civic engagement. They also encourage cultural industries to create human-centred security narratives that reveal deterrence's human cost and imagine cooperative alternatives through video games, music, films, and books.

V. Confronting the Real-World Consequences

The group urges **states** to:

- Support studies on the consequences of nuclear war and provide information to the public and policy-makers. Governments and international institutions should support and finance independent studies that examine the full impact of nuclear war. These findings must be made accessible to the public to foster informed debate. Furthermore, sustained dialogue between NWS and NNWS must be prioritised to build trust, share responsibility, and collectively reduce the risk of nuclear escalation.

VI. NNWS Diplomacy

The group urges **states** to:

- Improve coordination between NNWS to push for disarmament.
- Establish a South-South Disarmament Forum modelled on NAM and G77 cooperation mechanisms.
- Promote multidimensional and multilevel diplomatic talks to develop approaches that can lead to the identification of new political, economic, and security incentives to dissuade their reliance on nuclear deterrence.

FOCUS GROUP TWO

Integrating Forward-Looking Strategies Involving AI Governance, Cybersecurity Resilience, Climate Adaptation, and Inclusive Global Policymaking

GROUP MEMBERS:

Emily Day

Sanaa Alvira

Griffiths Ama Amoatemaa Nimako

Focus Group 2 (FG2) wanted to emphasise how their work on this policy cycle builds on the previous two phases of the EVN's 'De-siloing' policy cycle series.[25] With the work of these previous policy cycles in mind, FG2's scenarios and workshop discussions were often centred around the many potential roles of different forms of Artificial Intelligence (AI) in the future. As AI and other advanced technologies become more embedded in everyday life and integrated into complex military systems, a future where AI is incorporated into nuclear systems—such as command-and-control structures and risk assessment frameworks—no longer feels far off. In their more favourable future scenarios, AI can help prevent escalation and strengthen the global nonproliferation regime when applied properly. However, when used recklessly, it has the potential to destabilise deterrence norms, increase miscalculation risks, and deepen distrust between states. Such is the importance of this issue that all six of FG2's policy recommendation themes are linked to AI and nuclear weapons.

When developing their recommendations, they decided to use the following questions to guide them: How should AI be used in nuclear contexts, if at all? What are acceptable boundaries? Who gets to decide? Throughout their envisaged scenarios, they saw that while AI offers potential benefits, it also poses significant risks. Currently, AI is developing at a "supersonic" speed,[26] making it difficult for governance to keep up. Andrew Jones argues that nuclear policy experts should be involved in developing future governance policies for AI as it becomes increasingly prominent across nuclear technology.[27] FG2 was concerned that poorly governed AI in nuclear systems, both military and civilian, could introduce new cyber vulnerabilities, reduce human oversight, amplify misinformation and mistrust, and strain the nonproliferation regime.

Their favourable final scenario starts in 2025-30 with the strengthening of nuclear safeguards and nonproliferation through new advances in AI. Instead of focusing on AI for military capabilities, the world agrees to focus on developing AI to assist with peace and diplomacy. One way this is done is by conducting AI-based vulnerability scanning in national regulatory and safeguard frameworks. Another key use of AI in this scenario is to help

25 Kim Obergfaell (ed)," De-siloing Existential Threats: Challenging Identity, Power, and Inclusivity in the Nuclear Policy Field", *BASIC*, (2023) https://basicint.org/anthology-de-siloing-existential-threats/; Declan Penrose," De-siloing Existential Threats II: Tracking the Interconnections Between Global Dangers", *BASIC*, (2023) https://basicint.org/report-de-siloing-existential-threats-2/.

26 Andrew Jones, "From nuclear stability to AI safety: Why nuclear policy experts must help shape AI's future Share", *European Leadership Network*, (2025) https://europeanleadershipnetwork.org/commentary/from-nuclear-stability-to-ai-safety-why-nuclear-policy-experts-must-help-shape-ais-future/.

27 Ibid.

develop new disarmament and non-proliferation verification methods. These AI applications strengthen existing treaties and arms control agreements, such as the NPT and TPNW, and are implemented in new ones. This increased transparency helps to improve trust between states. States also agree that humans should always remain in control, making human oversight on AI essential with all of its uses regarding nuclear technology.

These improving relations are further boosted by transparency measures involving data sharing between countries to reduce mistrust by 2035. New AI models are being developed to detect malware in nuclear safety systems. Furthermore, AI is used to improve crisis simulations by the NWS and to find ways to avoid nuclear war in times of conflict. As trust and the role of AI in peace and security continue to grow into the second half of the 2030s, countries collaborate to develop universal standards and norms for AI in nuclear technologies. These new standards become international agreements. More new uses of AI in verification also emerge, such as AI integration into satellite imagery analysis to detect reactor activity and undeclared enrichment. This further strengthens the non-proliferation regime.

By 2045, improved diplomacy and collaborative policies will have led to the beginning of the end of nuclear weapons. The TPNW officially incorporates AI into its verification methodologies, offering a trustworthy and irreversible path to disarmament. The IAEA adopts similar measures, making it much harder to clandestinely develop nuclear weapons. In this more trustful and transparent geopolitical situation, the world agrees that it is time to abolish nuclear weapons. In this scenario, AI is far from the sole driver towards disarmament. However, it does play a vital role in improving trust between states and making nuclear disarmament and proliferation verifiable more than ever before.

In their unfavourable scenario, FG2 explored the potential dangers of AI integration into nuclear security and nuclear weapons command and control. Nuclear accidents occur at nuclear energy sites due to a lack of human oversight on the autonomous AI systems that have been built to run them. Throughout this future scenario, an overreliance on AI greatly increases nuclear risks in peaceful and military applications. As states become bolder with their use of AI, distrust means states fail to develop meaningful AI use agreements and regulations. This leads to unequal and unsafe AI-nuclear systems.

> **The risk of nuclear war is greatly increased by states using AI to conduct cyberattacks on their adversaries.**

These unchecked AI deployments, poor international dialogue, and a lack of human oversight all contribute to a more opaque and unstable world. These factors eventually culminate in a nuclear war. Only then does the world learn that overreliance on AI risks catastrophe, and a lack of regulation on arms and technology fuels instability. Furthermore, opacity weakens trust and cooperation. Only after learning these lessons the hard way does the world decide to pursue disarmament and international collaboration.

In their 'desirable' visions of a world beyond nuclear deterrence, the role of AI in nuclear technology was to advise humans who should always remain in control. This important accountability measure is their first policy recommendation. As an example, integrating AI into nuclear early warning systems could help prevent a nuclear escalation.[28] However, experts such as Dr Marion Messmer fear that over-relying on AI could increase the possibility of an inadvertent escalation caused by a machine independently selecting and firing on a target without human oversight.[29] This possibility was imagined in FG2's undesirable future pathways. Furthermore, history has shown that human judgment can avert disaster. In September 1983, Lieutenant Colonel Petrov from the Soviet Union was an officer at the command centre for the Oko nuclear early-warning system when the system reported five missiles had been launched from the United States.[30] Petrov discerned that the situation was a false alarm and prevented a nuclear war. Petrov questioned why the United States would only launch five missiles to attack Russia. Context and individual human judgement play an important role, which AI may never be able to incorporate.

28 Marion Messmer, "What happens if AI goes nuclear?", *Chatham House*, (2025) https://www.chathamhouse.org/publications/the-world-today/2025-06/what-happens-if-ai-goes-nuclear.

29 Ibid.

30 "Stanislav Petrov", *National Park Service*, https://www.nps.gov/people/stanislav_petrov.htm.

FG2 also urges states to collaborate on and agree to global AI safety norms and regulations. In their desirable scenario, there global AI safety standards were created through international cooperation to create legislation and share information. These norms and regulations specifically address how AI is integrated into nuclear energy and weapons systems. Without clear and agreed-upon international safety norms, states may pursue inconsistent standards, increasing the risk of unintended escalation or accidents. There is precedent for similar regulations. The 1994 Convention on Nuclear Safety created shared expectations of safety for civil nuclear power.[31] FG2 argues that a similar model could apply to AI safety standards in civil and possibly in the future military nuclear domains. International Humanitarian Law (IHL) has also been used to ban specific weapons, such as exploding projectiles and expanding bullets (1868 and 1899), and the 1997 Anti-Personnel Mine Ban Convention.[32] It could also be used to ban specific applications of AI in nuclear weapons systems, particularly autonomous systems.

Developing a global understanding of how AI can strengthen or undermine nuclear safeguards, security, safety, nonproliferation, and disarmament is therefore critical to ensuring the technology is used appropriately in the future. Their third policy recommendation is to develop a global research collaboration on AI governance. This could take the form of independent expert groups, similar to the Intergovernmental Panel on Climate Change.[33] In their undesirable future pathways, FG2 envisaged that there would be no global coordination on AI uses and regulation. In particular, they were concerned by the prospect of AI being used to carry out cyberattacks on adversaries. AI could enable autonomous cyberagents to attack and defend at a near constant rate,[34] placing nuclear facilities and command and control at severe risk. Furthermore, there is the risk of AI being used to generate images and videos that spread nuclear disinformation[35] that increase public fear of nuclear war. FG2 determined that if this possibility is not regulated, states could be vulnerable to regular cyberattacks on nuclear infrastructure. AI-enabled systems are highly susceptible to cyber attacks in ways that traditional military platforms are not, providing new opportunities for hackers to access and sabotage sensitive military data or disrupt military operations.[36] The more AI is relied upon in nuclear security and weapons systems, the higher these risks are. Another feature of FG2's undesirable futures was an overreliance on AI, making states more vulnerable to cyberattacks.

FG2 was also concerned about the potential lack of transparency on how states would be using AI, particularly in nuclear weapons systems. There is also the issue of the opacity of AI systems, known as the "black box" problem. This makes it difficult to understand how an AI system reaches a conclusion, which could undermine trust and make AI's use in high-stakes scenarios, such as nuclear decision-making, less viable.[37] FG2's undesirable scenarios saw a lack of transparency undermine trust and efforts to develop collaboration and dialogue. That is why their fourth policy recommendation focused on enhancing transparency on AI uses with nuclear technologies. They went as far as to suggest that states should disclose their use of AI at international forums, such as NPT meetings and at the United Nations (UN) General Assembly. Transparency initiatives can draw on models such as the Confidence- and Security-Building Measures (CSBMs) developed during the Cold War, which were designed to increase openness about military activities in Europe and reduce the risk of armed conflict.[38] Such measures could be vital steps to improving transparency and trust around the use of AI in nuclear weapons systems.

As previously stated, FG2 was not just concerned with the potential negative impacts of AI on nuclear issues. They also sought to maximise the potential benefits of AI, including how it could be used to aid

31 "Convention on Nuclear Safety", *IAEA*, https://www.iaea.org/topics/nuclear-safety-conventions/convention-nuclear-safety.

32 "Weapons and Disarmament", *International Committee of the Red Cross*, https://www.icrc.org/en/law-and-policy/weapons-and-disarmament.

33 "The Intergovernmental Panel on Climate Change", *IPPC*, https://www.ipcc.ch/.

34 Chris Spedding, "Mapping the Influence of Disruptive Technologies on Future Arms Control Agreements", *BASIC*, (2024) p. 11. https://basicint.org/wp-content/uploads/2024/08/Mapping_the_Influence_v04-1.pdf.

35 Ibid p .12.

36 Alice Saltini, "Navigating cyber vulnerabilities in AI-enabled military systems", *European Leadership Network*, (2024) https://europeanleadershipnetwork.org/commentary/navigating-cyber-vulnerabilities-in-ai-enabled-military-systems/.

37 Alice Saltini and Yanliang Pan, "Beyond Human-in-the-Loop: Managing AI Risks in Nuclear Command-and-Control", *War on the Rocks*, (2024) https://warontherocks.com/2024/12/beyond-human-in-the-loop-managing-ai-risks-in-nuclear-command-and-control/.

38 "Confidence and Security Building Measures", *Organization for Security and Co-operation in Europe*, https://www.osce.org/secretariat/107484.

disarmament efforts. Their fifth policy recommendation centres on using arms control and AI governance to help promote disarmament. In addition to increasing stability and reducing risks, increased arms controls and AI regulations in their desirable future scenarios helped forge the path to nuclear disarmament. They believe that treaties should explicitly regulate the use of AI in nuclear systems and promote the redirection of emerging technologies toward peaceful and developmental purposes.

> **Future disarmament or arms control treaties could include specific language prohibiting autonomous nuclear decision-making and restricting AI applications that could undermine verification, transparency, or crisis stability.**

Linking AI governance to disarmament conversations now would better future-proof the nonproliferation regime and strengthen the credibility of international commitments. This could also strengthen the irreversibility of disarmament.

For their sixth and final policy recommendation, FG2 sought to improve public awareness and inclusion regarding AI and nuclear technologies. Public engagement on the risks and governance of AI in nuclear contexts can create pressure for accountability and support long-term disarmament efforts. They believe that civil society and academic research on AI risks in military domains should be supported, and that researchers should be invited to present their research and advocacy in multilateral forums discussing AI. There should also be a special emphasis on the role of the younger generation in these discussions, sharing historical disarmament expertise and knowledge, and shaping the future leaders of nuclear governance, disarmament, and policymaking.

FG2 also argue that states and international organisations should invest in research that can highlight the benefits and dangers of AI. To better comprehend advanced AI's capabilities, consequences, and risk mitigations, for instance, the UK established the AI Security Institute to carry out research and construct the required infrastructure.[39] While this specific organisation might not be the answer, FG2 believes more research into the potential uses and impacts of AI is required before these technologies are implemented. This research should also be used to educate the public as well as policy makers on the implications of AI integration in nuclear technology.

39 *The AI Security Institute Website*, https://www.aisi.gov.uk/.

FOCUS GROUP TWO

Policy Recommendations

FG2 made their recommendations under 6 themes: Human Oversight in Nuclear Decision-Making (i), Global AI Safety Norms (ii), Global Research Collaboration on AI in Nuclear Governance (iii), Transparency (iv), Disarmament through AI Governance (v), and Public awareness and Inclusion (vi).

I. Human Oversight in Nuclear Decision-Making

The group urges **states** to:

- Prohibit autonomous systems in nuclear operations. Countries should recognise the of keeping a "human in the loop" when AI is used with nuclear technologies, and to remain aware that information from AI should never be blindly trusted.
- Retain human control in nuclear decision-making to prevent miscalculation, unintended escalation, or algorithmic errors.

II. Establish Global AI Safety Norms

The group urges **states** to:

- Develop international safety protocols that encourage stress-testing AI systems under various scenarios, including extreme scenarios, drawing on nuclear, aviation, and cybersecurity best practices to prevent inconsistent standards that may lead to the escalation of accidents.
- Safety protocols should include stress-testing AI systems in grey and black swan events, such as simulated nuclear crises and false alert scenarios.
- Norm-setting efforts should draw from nuclear safety culture and lessons from other high-risk sectors such as aviation and cybersecurity.

III. Facilitate Global Research Collaboration on AI in Nuclear Governance

The group urges **states** to:

- Consider establishing an independent expert group of technical experts from civil society and academia to conduct research on emerging technologies and their risks and opportunities for nuclear technologies, which can be made available to all countries for reference and shared understanding.
- Make research outputs publicly available to all countries to promote a shared understanding and reduce the knowledge gap between advanced and emerging nuclear energy states.

IV. Enhance Transparency

The group urges **states** to:

- Encourage countries to be open about any use of AI in the nuclear command and control systems as a first step towards transparency. Encourage countries to state in their national capacities any use of AI in multilateral forums such as NPT meetings and the UN General Assembly.

V. Promote Disarmament Through AI Governance

The group urges **states** to:

- Encourage countries to initiate dialogue and cooperation on AI applications in the military and nuclear domain.
- Encourage countries, especially Nuclear Weapons States, to independently conduct a review and risk assessment of the integration of AI in nuclear applications, and share best practices and lessons learned as a confidence-building measure to other countries.

VI. Public Awareness and Inclusion

The group urges **states** to:

- Support civil society and academia research on AI risks in military domains and invite them to present their research and advocacy in multilateral forums discussing AI. Public involvement can create pressure for accountability and support long-term disarmament efforts.

FOCUS GROUP THREE

Increasing Accountability and Mitigating Nuclear Weapons Risks to Transition to a World Beyond Nuclear Deterrence

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Focus Group 3 (FG3) utilised Foresight Methodology in their workshops for their desirable future pathways to contextualise a global strategic restraint regime aimed at increasing accountability of NWS and non-nuclear states NNWS. They also imagined how to foster an environment of active diplomatic engagement and public advocacy to facilitate a transition beyond nuclear deterrence by 2045. In their unfavourable future pathways, the absence of an effective accountability framework raised the likelihood of unintended escalation, highlighting the urgent need for a cohesive strategy that promotes risk reduction and builds trust between NWS and NNWS.

FG3 shares FG2's concern that the rapid integration of AI and other advanced systems into military decision-making can lead to black-box outcomes, unintended escalation, and ethical compromises, particularly when human oversight is reduced. Without timely, inclusive, and adaptive international frameworks, the risks of technological misuse may outweigh the opportunities for a desirable future without nuclear deterrence. FG3 were concerned by real-world examples such as Israel's use of the Lavender AI system in Gaza illustrates how such innovations, if unchecked, can result in significant civilian harm and raise concerns about the moral boundaries of algorithmic warfare.[40] As more states develop offensive and dual-use capabilities, crisis stability could become more tenuous, and misperceptions more likely, particularly if a cyber attack is initiated during a high-tension situation. This expansion of actors and variables increases the potential for escalation, even in the absence of direct intent.

If we are to move towards FG3's desirable pathway to a world beyond nuclear deterrence, we must foster multilateral cooperation and strengthen trust among stakeholders. Developing better understandings and bringing those typically marginalised from nuclear debates offers the possibility of reimagining international relations and security. Military deterrence does not become irrelevant in either FG3's desirable or undesirable futures. Yet, they believe we can work towards a future where the positives of deterrence is maximised and the risks, through dialogue, international agreements, and strong regulations. By fostering collaboration and addressing the underlying issues that contribute to conflict, we can work towards a future that prioritises security, cooperation, and the responsible governance of emerging technologies. The following policy recommendations are made with this in mind.

In their scenarios, FG3 found that technological progress, alternative deterrence capabilities, climate change, strategic restraints, and civil society efforts were some of the most important drivers in shaping a future beyond nuclear deterrence. They were keen to explore the potential positive and negative

40 Louisa Loveluck and Joby Warrick, "Lavender: Israel Offers Glimpse into Terrifying World of Military AI," *The Washington Post*, (April 4, 2024) https://www.washingtonpost.com/world/2024/04/05/israel-idf-lavender-ai-militarytarget/.

impacts of these drivers. By combining their imagined futures of these drivers, FG3 concluded that humanity faces varying risks of environmental catastrophes and shifts in military spending that could compromise our ability to invest in environmental measures. However, in their desirable future pathways, the positive implications included improved climate protection through the replacement of nuclear weapons with less harmful conventional ones.

Their work together resulted in policy recommendations focusing on four key themes. These were: International Agreements, Treaties and Regulations; Participation, Representation, Transparency and Coordination; Technological Reliance, Capabilities and Limitations; and The Military Agenda. These recommendations were developed utilising their desirable and undesirable futures envisaged across the workshops. The following is a summary of their final visions of the future to conceptualise their policy recommendations.

In their desirable future, FG3 felt mitigating nuclear risks was key to transitioning peacefully to a world beyond nuclear deterrence. In the first five years of their favourable scenario, international collaboration was focused on reducing the risk of nuclear weapons use, be it deliberate or accidental. They argue that the effective use of technological innovation is vital for a future beyond nuclear deterrence, addressing nuclear risks alongside broader security issues like space and global strategic restraint regimes.[41] A lack of restraint towards new technologies and their applications was seen as a potential risk amplifier. They also concluded in their foresight exercises that increased participation, transparency, and coordination among states are essential for building trust within the global strategic restraint regime, fostering political goodwill, and enhancing collective security.[42]

Despite thinking decades ahead, FG3 concluded that the next five years (2025-2030) is critical for implementing measures to reduce risks linked to nuclear weapons and climate change. They believe addressing this should start with solidifying diplomatic relations and ratifying international agreements addressing the intersection of nuclear issues and climate challenges.[43] They also believe that creating long-term frameworks for security cooperation and diplomacy is crucial to mitigate nuclear proliferation risks.[44]

Somewhat similarly to FG2, they believe a key driver of the future of nuclear stability would be the establishment of comprehensive treaties that allow the integration of AI into nuclear command systems. AI utilised under effective governance and safeguards could reduce the chances of accidental escalation through misinterpreted data and improve early detection through advanced satellite surveillance. They believed these efforts needed to start early. Over the next 25 years, they envisaged a significant calming of relations between adversaries by 2035, a new wave of international treaties on arms control and technology by 2040, and by 2045, we would be on the path to disarmament and a new sustainable framework for international security.

FG3 was keen to explore the limitations and opportunities of their desirable scenario. The two primary limitations they identified were technology and geopolitics. FG3 feels a fragile and sense of optimism about the role of technology in advancing global peace and security. As FG2 previously showed, technological advancements can have a wide range of impacts that are not necessarily positive for global peace and security. Deep geopolitical rivalries, especially among major powers, risk transforming technological advancements into a zero-sum competition for increasing military capabilities, obstructing meaningful cooperation and shared regulatory norms. Therefore, FG3 believe there is a lack of confidence in the positive impacts of technology because, while it could support peace, its benefits are curtailed by political competition, ethical ambiguity, and the slow, fragmented nature of global governance.

41 Heather Hurlburt et al, "The "Consensual Straitjacket": Four Decades of Women in Nuclear Security", *New America*, (2019) https://www.newamerica.org/political-reform/reports/the-consensual-straitjacket-four-decades-of-women-in-nuclear-security/#authors.

42 Craig Kafura, "Americans Want a Nuclear-Free World", *The Chicago Council on Global Affairs*, (2020) https://globalaffairs.org/commentary-and-analysis/blogs/americans-want-nuclear-free-world.

43 Jürgen Scheffran, "Climate change, nuclear risks, and nuclear disarmament, from security threats to sustainable peace", *World Future Council*, (2016) p. 18 https://www.worldfuturecouncil.org/wp-content/uploads/2016/01/WFC_2009_Climate_Change_Nuclear_Risks_and_Nuclear_Disarmament.pdf.

44 Heather Hurlburt et al, "The "Consensual Straitjacket": Four Decades of Women in Nuclear Security".

The opportunities they see stem from not just "great powers" renewing their dialogues, but also increased participation from typically marginalised states and civil society. They also believe that we have the opportunity to shape global technology governance because, unlike during the Cold War, the security sector no longer dominates technological development. The same technologies fueling strategic anxieties could also enhance security. They could reduce nuclear risks by improving early warning systems and verification mechanisms that foster trust among states. If we can develop strong cyber ethics and AI governance, we can maximise the potential benefits of technology while mitigating its risks. Doing so will require broad global cooperation.

In their undesirable future pathways, FG3 envisaged mass rearmament and a hostile international arena. They imagined mass public distrust further driving geopolitical tensions, leading to global militarisation.[45] They envisaged that the most significant limitations are political. States' unwillingness to move beyond entrenched historical animosities and security anxieties fosters an environment fundamentally resistant to cooperation and disarmament. Starting in 2025-30, heightened geopolitical tensions are coupled with increased military spending and a failure to renew existing and create new international treaties on nuclear weapons. Civil society is sidelined and pushed out of international dialogues as their calls for diplomacy and peace fall on deaf ears. The public becomes increasingly scared of nuclear war, making domestic politics more volatile and nationalistic. This political inertia not only blocks meaningful dialogue but also translates into resource constraints, as disarmament, development, and the environment are deprioritised in favour of military investment. The dominant motivation under such conditions remains rooted in realpolitik and power projection, rather than cooperative security. How can there be international consensus when even regional agreements are failing, such as the Indus Water Treaty between India and Pakistan?[46]

By 2035, these increasing tensions and the nuclear arms race led to further nuclear proliferation. Regional conflicts escalate, and diplomatic efforts from states, international organisations, and civil society fail. States now almost exclusively focus on protecting their sovereignty through military power. By 2040, military capabilities, including nuclear, are drastically increasing thanks to new and disruptive technologies. States have become less risk-averse with their implementations of new technologies in their nuclear arsenals. Distrust continues to grow, and there is very little cooperation between states. By 2045, the nonproliferation regime and nuclear norms regarding non-use have collapsed, leaving us on the brink of either nuclear war or a new cold war. The world sits on a knife-edge of instability, distrust, and many more nuclear weapons.

When you connect FG3's bleak vision of an undesirable future with the geopolitical tensions of today, it can make that future appear a serious possibility. However, FG3 were keen to stress that while the landscape may appear grim, currently or in their undesirable future pathway, there is the possibility of a hopeful reimagining. If we can foster greater public engagement in nuclear policy, driven by awareness campaigns and digital access, we could have a more informed and vocal population. Furthermore, inclusive collaboration across states, civil society, and non-governmental organisations holds the potential to diversify perspectives and reinvigorate discourse on arms control, nudging policies toward more pragmatic and regionally grounded solutions.

By choosing the first theme of their recommendations to be international agreements, treaties, and regulations, FG3 hopes to foster a new wave of international arms control and cooperation. This includes agreements to regulate technologies such as AI before they could significantly disrupt nuclear security and deterrence. These agreements were vital in their favourable scenario to improve geopolitical stability and foster an environment conducive to dialogue and collaborations. Their second theme of participation, representation, transparency, and coordination seeks to further foster an environment of easing geopolitical tensions. In their unfavourable scenario, the ostracisation of civil society removed voices of reason and peace from international security and arms control debates. These organisations play a

45 Sneha Nair, "Converging Goals: Examining the Intersection Between Diversity, Equity, and Inclusion and Nuclear Security Implementation", in *Nuclear Threat Initiative's 16th Global Dialogue on Nuclear Security Priorities*, (2023) https://www.stimson.org/2023/converging-goals-examining-the-intersection-between-diversity-equity-and-inclusion-and-nuclear-security-implementation/.

46 Khurram Husain, "Indus water wars", *Dawn*, (2025) https://www.dawn.com/news/1907677.

vital role in developing arms control agreements and fostering dialogues between adversaries. These key stakeholders can offer an important, non-state perspective into these discussions.

> **By focusing on technology as their third policy recommendation theme, FG3 seek to ensure, along with new agreements and regulations, that rules must be established on human oversight for technologies such as AI and regular risk assessments on their potential risks.**

If we do not understand how these technologies are being implemented and how they are developing, we may struggle to produce effective regulations and agreements. In their favourable scenario, FG3 had states and civil society collaborating on emerging and disruptive technologies agreements. Without these in their unfavourable scenario, irresponsible implementations of these technologies increase instability and distrust.

Through their fourth and final policy recommendation theme on the military agenda, FG3 attempt to encourage states to prioritise peace and diplomacy over military capabilities. This is a key early step in their favourable future scenario, as this starts the process of developing a geopolitical climate that fosters dialogue and trust-building. It later contributes to the development of new arms control agreements. In their negative scenario, increasing military capabilities exacerbate tensions and instability. Through this change, and further steps to include academia and NGOs, they hope to limit the role of the military in the future in securing peace and stability.

FOCUS GROUP THREE

Policy Recommendations

The recommendations are targeted at the following groups of stakeholders: States, including both nuclear and non-nuclear states; civil society, including non-governmental organisations; and international organisations.

I. International Agreements, Treaties and Regulations

The group urges **stakeholders** to:

- Launch multilateral negotiations for a code of conduct regulating AI, cyber, space and other emerging disruptive technologies (EDTs) in and related to nuclear systems, setting clear definitions, risk-reduction benchmarks, and compliance procedures to clarify behavioural norms.
- **States** should convene a preparatory group under the UN First Committee and include the High-Level Advisory Body on Artificial Intelligence under the Office of the Secretary-General's Envoy on Technology (OSET) to define the scope, terminology, and verification needs for dual-use technologies in nuclear systems.
- **NGOs** should coordinate norm-building campaigns and publish annual assessments on legal and ethical risks of tech-nuclear integration to inform civil society and create public pressure.
- **International organisations** such as the UNIDIR and IAEA should provide critical feedback on possible measures to incorporate transparency measures and compliance reporting.

II. Participation, Representation, Transparency and Coordination

The group urges **stakeholders** to:

- Strengthen participation channels for civil society and regional bodies in disarmament policy making, supported by UN initiatives, such as invitations to conferences, research reports and calls for transparency standards, to reinforce inclusive governance and public trust in strategic restraint efforts.
- **States** should adopt and coordinate national stakeholder consultations before significant international disarmament meetings, support regional civil-military dialogue platforms, and increase transparency on their nuclear weapons if applicable.
- **NGOs** should establish regional participation hubs with support from policymakers to increase the capability of youths, marginalised groups and underrepresented stakeholders in nuclear, military and technological policy engagement, with measurable targets for representation by 2027.
- **International organisations** should expand civil society accreditation, offer paid and remote internships, work and volunteering opportunities for more inclusive recruiting, and promote publications tracking country commitments.

III. Technological Reliance, Capabilities and Limitations

The group urges **stakeholders** to

- Establish internationally agreed-upon minimum technical standards for AI integration in monitoring and verification systems, including verified human oversight and cybersecurity audits, and cross-validation protocols to improve technical capabilities and increase trust in results among public, private, and international stakeholders.
- **States** should form a working group under the Conference on Disarmament to draft interoperable AI safety criteria and independent oversight procedures for nuclear and non-nuclear military weaponry and technologies, and consolidate existing non-proliferation efforts such as the Missile Technology Control Regime (MTCR).
- **NGOs** should publish yearly risk assessments and policy briefs on the societal and ethical implications of various issues surrounding AI, such as automated verification, algorithm biases, with input from technical experts.
- **International organisations** such as the CTBTO should pilot and support the development of AI-based verification systems alongside civil society and private sector players using agreed minimum standards and publish audit results.

IV. Military Agenda

The group urges **stakeholders** to:

- Prioritise nuclear restraint in national and regional defence planning through confidence-building measures, such as crisis hotlines, resource reallocation away from nuclear to conventional systems, and parallel pursuit of bilateral nuclear arms control negotiations.
- **States** should publish revised defence doctrines, and incorporate feedback from NGOs while participating and aligning with regional defence planning efforts. States could also consider more transparency regarding nuclear weapons spending.
- **States** should push for greater collaboration between academia, NGOs and private sector industry players at the national level to encourage responsible innovation and development of military technologies, especially regarding using nuclear power.
- **NGOs** should coordinate more inclusive spaces for all stakeholder groups at the national and regional levels to provide consolidated feedback and concentrate public pressure on states to limit and ensure ethical usage of technologies for military purposes.

FOCUS GROUP FOUR

Denuclearising in a Climate-centric Global Security Context

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Focus Group 4 (FG4) also developed a favourable and unfavourable scenario during their workshops together. The favourable scenario was primarily driven by new technologies and the universalisation of the TPNW. They enabled radical changes that upended the practice of nuclear deterrence, which underpins the current nuclear order. Their unfavourable scenario, on the other hand, focused on military miscalculation and climate-induced nuclear accidents as drivers that could exacerbate existing risks associated with nuclear deterrence practices. However, FG4 believes the two scenarios differ in their perceived levels of plausibility. While the favourable scenario emphasises actions and interests sponsored by NNWS, it requires radical changes from current political trends. In contrast, the unfavourable scenario represents a continuation of ongoing political trends and privileges actions made by NWS. In other words, FG4 does not see us at a fork in the road where we are about to head toward one of their favourable or unfavourable future pathways. Instead, we are already heading towards the unfavourable scenario. Motivated by the intersections and convergences they identified between the scenarios, FG4 made policy recommendations where nuclear disarmament, climate cooperation, and restructured security institutions form the basis of global stability. Furthermore, nuclear weapons are no longer central to national or international security.

FG4 recognises the current state of affairs as a 'third nuclear age' defined by multipolarity, great power competition, and the erosion of arms control agreements.[47] We are also seeing climate-induced phenomena becoming more influential in national security– and not without implications for nuclear safety and security. Nuclear sites, such as nuclear power plants, temporary nuclear waste repositories, warhead manufacturing facilities, nuclear submarine ports, and shipyards, are increasingly vulnerable to wildfires, sea-level rise, and conflict.[48] Moreover, nuclear arsenals can in their own right exacerbate climate issues.[49] In fact, these weapons do not protect us from extreme climate events, and the money spent on them could be used to tackle climate change. Furthermore, physicist MV Ramana and others argue against relying on nuclear power to help address climate change because it is expensive, slow to build,

47 Andrew Futter, Ludovica Castelli, Cameron Hunter, Olamide Samuel, Francesca Silvestri, and Benjamin Zala, *The Global Third Nuclear Age: Clashing Visions for a New Era in International Politics*, (2025, London: Routledge).

48 Anaïs Maurer, *The Ocean on Fire: Pacific Stories from Nuclear Survivors and Climate Activists*, (2024, Durham: Duke University Press); Jessica McKenzie and François Diaz-Maurin, "Texas wildfires force major nuclear weapons facility to briefly pause operations", *Bulletin of the Atomic Scientists*, (2024) https://thebulletin.org/2024/02/texas-wildfires-force-major-nuclear-weapons-facility-to-briefly-pause-operations/#:~:text=Texas%20wildfires%20force%20major%20nuclear%20weapons%20facility%20to%20briefly%20pause%20operations,-By%20Jessica%20McKenzie&text=A%20wildland%20fire%20in%20the,and%20to%20evacuate%20nonessential%20workers; Allie Mooney, "How climate change could disrupt the construction and operations of US nuclear submarines", *Bulletin of the Atomic Scientists*, (2024) https://thebulletin.org/2025/04/how-climate-change-could-disrupt-the-construction-and-operations-of-us-nuclear-submarines/#:~:text=Most%20of%20the%20naval%20construction,becoming%20more%20vulnerable%20to%20flooding; Jamie Kwong, "How Climate Change Challenges the U.S. Nuclear Deterrent", *Carnegie Endowment for International Peace*, (2023) https://carnegieendowment.org/research/2023/07/how-climate-change-challenges-the-us-nuclear-deterrent?lang=en.

49 Kjølv Egeland, "Disentangling the Nexus of Nuclear Weapons and Climate Change—A Research Agenda", *International Studies Review*, 27(1), (2025).

we do not have effective long-term waste storage solutions, and it can even threaten non-proliferation.[50]

When placed in this context, the scale of the existential nuclear threat – as outlined in 'nuclear winter' models[51] – suggests radical disarmament measures are warranted. FG4 argues that nuclear disarmament is not as radical as it is often made out to be. Disarmament offers greater ethico-political value and, under favourable conditions, can be less volatile and more socio-environmentally astute than a continued reliance on nuclear deterrence.[52] Institutions involved in activities such as nuclear verification can leverage both existing and new technologies to foster practical irreversible disarmament,[53] but a culture shift is needed to accommodate emerging challenges.[54]

FG4 also believes that technological advances risk eroding confidence in the robustness of nuclear deterrence.[55] While some technologies might seemingly just enhance survivability, many other qualities found in emerging and disruptive technologies implemented in nuclear arsenal modernisation programmes are seen as destabilising.[56] As we are already seeing today, nuclear deterrence does not mean nuclear states never risk conflict with each other nor engage in destabilising behavior. Some seek territorial gains, strive for relative advantages, and prepare for conventional warfare, attempting to achieve, sustain, or escape stalemate.[57] Even technological advances in conventional weapons could exacerbate the risk of nuclear escalation.

The two scenarios are similar in that they both involve a complex network of state and non-state actors, regional and global dynamics, and particular interpretations of security, cooperation, and trust. In both, technological developments feature prominently as either mitigating factors or force multipliers.

FG4 was interested in the role of NGOs in global peace and security. As the global nuclear order continues to experience issues and crises, think tanks and policy experts generally employ the nuclear risk-reduction framework in their policy recommendations. This typically takes the form of an incremental, conservative, and consensus-based nuclear risk-reduction framework that assumes the manageability of nuclear risk and is, alone, insufficient to address the existential security implications of deterrence practice.[58] FG4 believes that more consequential actions in good faith are possible, and multilateral disarmament can be a vital step in developing a 'common security' arrangement, predicated on transforming the nuclear order, beginning with the de-securitisation of adversarial great-power relations.[59] They therefore argue it is in the long-term national security interests of NWS to eliminate the risk of nuclear winter and coordinate efforts to combat climate change-induced security threats.[60] A ceasefire in Ukraine could offer a major opportunity for stabilising adversarial relations between NATO and Russia, for example. Managing these factors could move us towards the path laid out in FG4's favourable scenario, while simultaneously stepping away from the possibility of their unfavourable scenario.

50 MV Ramana, *Nuclear is Not the Solution: The Folly of Atomic Power in the Age of Climate Change*, (2024, London; Verso Books); D. Cullen, "Stop Trying to Make Nuclear Power Happen", *New Socialist*, (2021) https://newsocialist.org.uk/stop-trying-make-nuclear-power-happen/.

51 Alan Robock, Luke Oman, and Georgiy L. Stenchikov, "Nuclear winter revisited with a modern climate model and current nuclear arsenals: Still catastrophic consequences", *J. Geophys. Res.*, 112(D13), (2007).

52 Becky Alexis-Martin, *Disarming Doomsday: The Human Impact of Nuclear Weapons since Hiroshima,* (2019, London: Pluto Press).

53 Nick Ritchie, "Irreversibility and Nuclear Disarmament: Unmaking Nuclear Weapon Complexes", *Journal for Peace and Nuclear Disarmament*, 6(2), (2023) pp. 218–243.

54 Leonardo Bandarra, Noah Mayhew, and Malte Göttsche, "The IAEA and Irreversibility: Addressing Political, Institutional, and Technological Verification Challenges in Former Nuclear-Armed States", *Journal for Peace and Nuclear Disarmament*, 7(2), (2024) pp. 302–321.

55 Keir A. Lieber and Daryl G. Press, "The New Era of Counterforce: Technological Change and the Future of Nuclear Deterrence", *International Security*, 41(4), (2017) pp.9--49 (p. 9).

56 Steve Fetter and Jaganath Sankaran, "Emerging technologies and challenges to nuclear stability", *Journal of Strategic Studies*, 48(2), (2024) pp. 252--296.

57 Keir A. Lieber and Daryl G. Press, *The Myth of the Nuclear Revolution: Power Politics in the Atomic Age*, (2020 Ithaca: Cornell University Press).

58 Nick Ritchie, "Irreversibility and Nuclear Disarmament: Unmaking Nuclear Weapon Complexes".

59 Thomas E. Doyle, *Nuclear Ethics in the Twenty-First Century: Survival, Order, and Justice*, (2020, London: Rowman & Littlefield).

60 Alan Robock and Owen Brian Toon, *Scientific American*, 302, (2010) pp. 74–81. https://climate.envsci.rutgers.edu/pdf/RobockToonSciAmJan2010.pdf; Benoît Pelopidas, Sanne Cornelia J Verschuren, "Writing IR after COVID-19: Reassessing Political Possibilities, Good Faith, and Policy-Relevant Scholarship on Climate Change Mitigation and Nuclear Disarmament", Global Studies Quarterly, 3(1), (2023), https://doi.org/10.1093/isagsq/ksad006.

> **FG4 was particularly concerned by the climate-nuclear nexus. By drawing on Seth Baum's conceptualisation of a 'double catastrophe', FG4 sought to highlight how one catastrophe, its drivers, or consequences, can reinforce or trigger another catastrophe, ultimately accelerating societal collapse.[61]**

A double catastrophe may follow from lesser catastrophes interacting in complex ways, like a regional nuclear war which induces a severe climatic effect – namely, nuclear winter. In this hypothetical event, a protracted nuclear exchange results in widespread climatic disruption, threatening global stability. Hence, a seemingly contained 'lesser' nuclear event war could still have far-reaching consequences by interacting with the ongoing climate crisis. A climate-nuclear double catastrophe could also unfold in reverse. For example, a runaway climate catastrophe, like the 'hot-house earth,' can elevate nuclear risks, especially through compromised infrastructure, heightened regional tensions, or accelerated arms proliferation. Each of these existential threats – nuclear and climate – can act as a risk multiplier to the other, further increasing the need for cooperation and treaties to address the threat of nuclear war and climate change.

Another possibility in FG4's unfavourable scenario in the climate-nuclear nexus was the possibility of climate-induced nuclear accidents. These can be caused by the climate directly through extreme weather events, floods, hurricanes, and sea-level rise. Rising sea levels in particular could impact the safety and security of naval nuclear weapons systems, whose facilities lie along coasts under threat of hurricanes and sea-level rise, which could compromise construction, delivery, maintenance operations, and deployment.[62] The climate can also indirectly contribute to nuclear accidents and even nuclear escalations in the long-term. Climate change is driving up the demand for nuclear energy. Indeed, a pledge was announced in COP29 to triple investment in nuclear energy.[63] However, expanded nuclear energy generation can contribute to nuclear accident risks. The race to acquire fissile materials for nuclear energy generation could potentially trigger trade disputes or resource wars. These could be the first steps in a long sequence of tensions and conflict that could lead to a nuclear escalation. Also, the race to achieve Artificial General Intelligence (AGI) might accelerate the deployment of small modular reactors (SMRs) without adequate safety protocols,[64] amplifying the risks of climate-induced nuclear accidents.

FG4 was also concerned by the possibility of military miscalculations resulting in a regional nuclear war. Many strategic studies experts envisage major nuclear escalation risks in NATO–Russia and Sino–American 'hot war' scenarios. Chinese strategists are concerned over US conventional capabilities that threaten China's nuclear arsenal, while there are also wider fears of non-nuclear attacks on nuclear forces or command, control, communication, and intelligence capabilities, which would be 'highly escalatory' – amounting to 'escalation entanglement' – which could lead to a nuclear war.[65] Emerging and disruptive technologies increase these risks by offering states new ways to attack their adversaries' nuclear capabilities. A hypothetical limited nuclear exchange between the US and China would likely involve counterforce targeting initially military targets rather than civilian centres, and yet could lead to further escalation to counter-value targeting, such as cities, sparking a global catastrophe and therefore must be avoided.

61 Seth D. Baum, Timothy M. Maher, Jr., and Jacob Haqq-Misra, "Double catastrophe: intermittent stratospheric geoengineering induced by societal collapse", *Environment Systems & Decisions*, 33(1), (2013) pp. 168–180.

62 Allie Mooney, "How climate change could disrupt the construction and operations of US nuclear submarines".

63 'COP29 UN Climate Conference Agrees to Triple Finance to Developing Countries, Protecting Lives and Livelihoods.' UN Climate Change News (November 24, 2024) https://unfccc.int/news/cop29-un-climate-conference-agrees-to-triple-finance-to-developing-countries-protecting-lives-and.

64 On the confluence of artificial intelligence data centers and small modular reactors, see Dawn Stover. "AI goes nuclear", *Bulletin of the Atomic Scientists*, (2024) https://thebulletin.org/2024/12/ai-goes-nuclear/. On small modular reactor risk assessments, see Edwin Lyman, (September 2013). *Small Isn't Always Beautiful. Safety, Security, and Cost Concerns about Small Modular Reactors*, (2013, Cambridge, MA: Union of Concerned Scientists) https://www.ucs.org/sites/default/files/2019-10/small-isnt-always-beautiful.pdf; "Five Things the 'Nuclear Bros' Don't Want You to Know About Small Modular Reactors," *The Equation Union of Concerned Scientists Blog*, (2024) https://blog.ucs.org/edwin-lyman/five-things-the-nuclear-bros-dont-want-you-to-know-about-small-modular-reactors/.

65 James, M. Acton, "Escalation through Entanglement: How the Vulnerability of Command-and-Control Systems Raises the Risks of an Inadvertent Nuclear War", *International Security*, 43(1), (2018) pp. 56–99, https://doi.org/10.1162/isec_a_00320.

FG4's favourable scenario begins with the spectacular announcement from President Trump and Putin that they have agreed to total nuclear disarmament. While this hinges on the other seven nuclear states also disarming, the nuclear disarmament movement takes full advantage. The IAEA quickly sees its mandate and capacity expanded to verify full nuclear disarmament. This helps pave the way for verifiable and irreversible nuclear disarmament. Furthermore, the India–Pakistan crisis is resolved, and the US and Iran agree on a new nuclear deal.[66] Part of this radical change is due to a re-evaluation of political possibilities that responds to the scale of the problems, re-aligns national interests, and centralises dialogue, collaboration, and arms control in peace and security. This new atmosphere and the growing entanglement of nuclear weapons with new technologies renders nuclear deterrence obsolete. Furthermore, this shift towards cooperation is driven by the aggravation of the climate crisis. Climate catastrophes force states to realise that their security is deeply intertwined and that they must work together now to address climate change.

The joint efforts of NNWS, NWS, civil society, and NGOs see the achievement of full universalisation of the TPNW by 2035 as all NWS commit to full disarmament. China is convinced of the sincerity of the US and Russian commitment, and the other NWS soon follow. Furthermore, the US ends its stance of ambiguity towards Israel's nuclear arsenal and successfully pressures it to disarm. Soon, the TPNW will have a total account of every nuclear warhead in the world, aiding plans to disarm them all as soon as possible. The IAEA's new verification capabilities make non-compliance with disarmament and proliferation too impractical, strengthening the irreversibility of a world without nuclear weapons.

By 2040, the process of disarming all nuclear warheads is underway with IAEA oversight. This process is not smooth, however, as there are several disagreements and escalation risks at this point that temporarily hold back the process. There are some concerns about the potential of NWS states 'cheating' and secretly holding a small stockpile. These concerns and challenges are overcome through fissile material waste disposal transparency; however, they mean that it takes several more years to complete full global disarmament in 2045.

FG4 envisaged two versions of their unfavourable scenario. FG4's unfavourable scenarios start just as dramatically as their favourable scenario. China launches an invasion of Taiwan by 2030, in one unfavourable scenario, triggering a Sino-American hot war. The high stakes involved in this conflict lead to nuclear use through military miscalculation, shattering the norm against nuclear use and causing immense harm and destruction. Nuclear reactors catch fire in this conflict due to deliberate and accidental bombings, causing more radiation exposure. This encourages the NWS to further expand their arsenal. Furthermore, this war launches a trade war between China and the West, causing massive economic struggles. There is also a significant nuclear powerplant disaster which contaminates the local water supply and poisons entire ecosystems. Faith in nuclear energy is shattered, weakening the NPT's pull of sharing peaceful uses of nuclear technology.

In their other unfavourable scenario, the Sino–American conflict is a protracted cold war that lasts for many years. Into the 2030s, this conflict is still ongoing. This alternative scenario also sees a global proliferation of SMRs, facilitated by new AI systems that can run most of their functions with little human oversight. This mass spread of SMRs is encouraged by heavy nuclear energy campaigning from energy companies, particularly around Conference of the Parties (COP) events on climate change. However, this increase in reactors greatly increases the chances of a nuclear accident. Nuclear arsenals continue to expand, and the risk of nuclear proliferation rises greatly as more states look to nuclear deterrence for security.

By 2040, in the Sino–American hot war, China comes out on top due to its long-term military build-up. In both unfavourable scenarios, the NWS continue to expand their arsenals, entrenching their reliance on nuclear deterrence. SMRs across the world become both sources of accidents and targets of terrorism, and it becomes clear that many NNWS have been using them to hide their own nuclear weapons programmes. Nuclear accidents and terrorism have led to the air and oceans becoming contaminated by radionuclides. The covert weapons programmes enable nuclear proliferation and a huge increase in the chances of nuclear war.

66 This scenario was envisaged before the US attacks on Iran on June 22nd, 2025.

By 2045, both unfavourable scenarios conclude with a double catastrophe of a nuclear and environmental disaster. While the states were busy arms racing and not engaging in dialogues that could lead to cooperation, climate change continues to worsen.

> **By 2045, the risk of a double catastrophe is exponentially higher than before, firstly due to the mass horizontal and vertical proliferation of nuclear weapons and SMRs.**

Secondly, this is made more likely by the failure to address climate change, which increases the rate and severity of extreme weather events. These nuclear facilities frequently become subject to these events, leading to nuclear disasters and immense environmental harm. This future is bleak as the earth is left heavily contaminated with radiation, yet still looking to deterrence and distrust for security.

FG4's first theme they focused on when making their recommendations, was new technologies and the rise of climate-centric security. In their scenarios, the group demonstrates how emerging technologies and the climate crisis can be used to strengthen or weaken international peace and security. FG4 seeks to encourage states to better understand the opportunities and risks of emerging technologies, particularly AI, and produce effective governance of them. They also aim to strengthen the understanding of the link between climate and nuclear issues to ensure this is kept in mind by states, NGOs, and civil society. They hope this can help avert the disastrous "double catastrophe" they envisioned in their unfavourable scenarios.

Their second subject theme was the perils of the nuclear risk reduction framework. They want researchers to study multiple approaches to risk reduction, including ways that do not legitimise nuclear weapons ownership. They hope to avoid the entrenchment of nuclear deterrence that is seen in their unfavourable scenarios, which not only holds back nuclear disarmament but can also contribute to horizontal and vertical nuclear proliferation. They also produce several recommendations to reduce the risk of nuclear accidents. Such accidents plague their unfavourable scenarios. They hope to avoid such disasters in the future, which would contaminate our ecosystems with radioactive materials. They also make the recommendation of increasing the mandate of the IAEA to oversee disarmament, which was a key event in their favourable scenario.

FG4 made the following five recommendations that focus on promoting 'common security' principles within future analysis and practice frameworks and bridging substantive issues to create intersectional dialogue and solutions for the global commons. These recommendations are also designed to help move beyond nuclear deterrence and narrowly defined national interests. The recommendations focus on climate-centric security, new technologies, and re-evaluating nuclear risk-reduction frameworks. The recommendations speak to thought processes that the group identified as necessary to combat the numerous existential risks that featured in both the favourable and unfavourable scenarios. The recommendations trace their motivation to 'common security' thinking and contemporary theories of multilateral cooperative action.

FOCUS GROUP FOUR

Policy Recommendations

I. Research institutions and think-tanks

The group urges **research institutions, including think-tanks** to:

- Reconsider the implications of nuclear risk-reduction recommendations and seek to work within frameworks that do not assume the manageability of nuclear risks and sufficient control of nuclear technologies, with such approaches being understood to support the legitimisation of possession of nuclear weapons and the practice of nuclear deterrence. Researchers should develop frameworks that reject the notion of the manageability of nuclear risk, advocating instead for a common-security arrangement which better responds to the existential character of nuclear risk.
- Focus more research efforts on studying and documenting methods of "learning to see incompetence" to build the capacity of states to react legally, politically, and socially to accidents, miscalculation, and unforeseen situations where nuclear technologies when combined with other risk factors, namely climate change and new technologies, present a heightened risk of a catastrophic event occurring.
- Renew and expand efforts to develop the nuclear–climate nexus as an area of special investigation in theory and policy. Invest in reports on the nuclear–climate nexus that involve future and foresight methodologies and learnings, and which respond to the risk of 'double catastrophes' with existential implications. The resulting reports should outline a range of catastrophic scenarios that emphasise the interaction between, and compounding effects on, threats to regional and global security.

II. States

The group urges **states** to:

- Expand the mandate of the IAEA to produce a treaty-backed agency that oversees disarmament processes, including securing fissile material, sustainable dismantlement verification, preventing rearmament, and supervising the reintegration of fissile material into electric grids. States should increase resources for the IAEA to increase its inspectorate while leveraging existing and new technologies.
- Prioritise transparent fissile material disposal by mandating independently verified reporting on the downblending of fissile materials and repurposing of nuclear devices and facilities. Industry could be encouraged to get involved to drive innovation for repurposing materials and devices, with such efforts focusing on a 'recycling' model for sustainability and encouraging international cooperation that allows technical innovations to be shared between beneficiaries.
- Institutionalise climate-based security alliances rooted in urgent climate cooperation (e.g. 'Atoms for Climate' coalitions). These coalitions could mitigate latent risks, risk cascades, and systemic risks derived from both nuclear competition and accidents in an environment of climate insecurity. States should leverage existing and emerging technologies to improve emergency response preparedness.

III. International organisations and monetary funds

The group urges **international organisations and monetary funds** to:

- Embed disarmament benchmarks in climate finance mechanisms to ensure recipients of climate funding are meeting their disarmament obligations.
- Create preferential climate loans to fund efforts to tackle climate change matched against disarmament progress indicators as a means to encourage states to pursue security through sustainability.

IV. States and international organisations

The group urges **states and international organisations** to:

- Fund expert networks linking climate science, disarmament, and peacebuilding to establish joint observatories that continuously report on risks emanating from these intersecting issues.
- Work in this regard should highlight the interconnectedness between substantive issues, so that more intersectional experts can connect event effects occurring in each issue area, and that cannot be addressed in isolation. It should be further emphasised that any resulting initiative must be non-partisan, with funding non-conditional to the greatest extent possible to ensure independence from political agendas and continuity between administrations.

V. States, international organisations, and civil society

The group urges **states, international organisations, and civil society** to:

- Research and develop policies to safeguard SMR proliferation and the need to balance this effort with developing country energy needs.
- Invest in research on SMRs and the integration of AI, and the development of appropriate safeguards and regulations.

Conclusion

Across the four focus groups, two consistent observations can be made.

Firstly, the focus groups believe that **significant measures and course corrections are required** for us to achieve any of their 'favourable' future pathways to a world beyond nuclear deterrence and avoid their 'unfavourable' future scenarios.

Secondly, all of the groups expressed that while **technological advances can benefit the goals of nuclear disarmament and stability, they also have the potential to have the opposite impact** if we are not careful in how they are implemented into nuclear arsenals. Mitigating these risks will require global cooperation, transparency on the uses of emerging and disruptive technologies in nuclear arsenals, and developing international agreements and regulations.

There are also shared concerns about how nuclear risks can be exacerbated by climate change, increasing the chances of both nuclear incidents, war, and climate catastrophes. To take the steps required towards peaceful, irreversible nuclear disarmament, the focus groups consistently recommend broadening the range of perspectives at the table beyond the nuclear states and including civil society.

We also see calls to bring the public into the fold and better inform them on nuclear issues, as an uninformed and ambivalent public cannot hold their governments to account. The participants of this policy cycle believe much work needs to be done to achieve a favourable, peaceful future free of nuclear weapons. Yet, there is hope, particularly when the emerging voices of nuclear security display such expertise and passion to lead us into the future.

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About the Policy Cycle Participants

22

EVN members participated in the Policy Cycle for its duration and contributed policy recommendations for this report.

Where were the policy cycle members from?

6	8	3	2
Europe	Asia	Africa	North America

1	1	1
Middle East	Oceania	South America

A total of 13.59% of policy cycle participants were from the Global South.

17

of participants identified as female or as a gender minority, 85%.

There were in total of 16 nations represented in this policy cycle.

This helps the EVN to continue its pledge to foster dialogues and relationships between the Global North and Global South, and to ensure diversity and inclusivity are at the heart of this project.

Thank You to the Participants

We would like to thank all of the members involved in the policy cycle for their thorough engagement, their willingness to learn, and for making this report possible. The EVN is nothing without its members, who will go on to be the future leaders of nuclear policymaking.

APPENDIX

List of Acronyms

AGI	Artificial General Intelligence
AI	Artificial Intelligence
CND	Campaign for Nuclear Disarmament
COP	Conference of the Parties
COP29	Conference of the Parties of the UNFCCC
CSBMs	Confidence- and Security-Building Measures
CTBT	Comprehensive Test Ban Treaty
CTBTO	Comprehensive Nuclear-Test-Ban Treaty Organisation
EVN	Emerging Voices Network
FG1	Focus Group 1
FG2	Focus Group 2
FG3	Focus Group 3
FG4	Focus Group 4
HIA	Humanitarian-Impact Annex
IAEA	International Atomic Energy Agency
IHL	International Humanitarian Law
MIC	Military Industrial Complex
MTCR	Missile Technology Control Regime
NGO	Non-Governmental Organisation
NNWS	Non-Nuclear-Weapon States
NPT	Nuclear Non-Proliferation Treaty
NWFZ	Nuclear-Weapon-Free Zone
NWS	Nuclear-Weapon States
OPCW	Organisation for the Prohibition of Chemical Weapons
SDG	Sustainable Development Goals
SMRs	Small Modular Reactors
TPNW	Treaty on the Prohibition of Nuclear Weapons
UN	United Nations
UNODA	United Nations Office for Disarmament Affairs

BASIC promotes meaningful dialogue amongst governments and experts in order to build international trust, reduce nuclear risks, and advance disarmament.

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