ARCTIC FUTURES SYMPOSIUM 2022: SUMMARY REPORT

After two years of online and hybrid events, the 13th edition of the Arctic Futures Symposium returned to an in-person format at the beautiful Residence Palace in Brussels' EU Quarter.

The Symposium was held from November 29th to November 30th, offering participants a comfortable and entertaining ambience with frequent coffee breaks, serving Arctic delicacies brought by our Arctic Futures partners.

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Tuesday, November 29th

WELCOME FROM THE ORGANISERS

- **Nicolas Van Hoecke** (Managing Director, International Polar Foundation)
- **Alain Hubert** (Founder and President, International Polar Foundation)

The 13th edition of the Arctic Futures Symposium was introduced by **Nicolas Van Hoecke**. Welcoming all partners, participants, speakers, and moderators, he paved the way for two days of insightful speeches, presentations, discussions, and Q&As.

Alain Hubert launched the first day of the Symposium, welcoming everyone via satellite link from the Princess Elisabeth Antarctica, the first zero-emission polar research station. Thanking all speakers, moderators, and partner organisations, he emphasised the pertinence and wide-ranging impact of this event for the Arctic region, its stakeholders, and inhabitants. Presenting the Symposium's different panels, he announced that on the second day, the International Polar Foundation would award the first Laurance Trân Arctic Futures Award - a prize of 7500€ established with the support of the Trân family - to a young business exploring sustainable solutions to Arctic challenges.

OPENING KEYNOTES

- **Angelina Eichhorst** (Managing Director, European External Action Service) - *Speaking on behalf of High Representative and European Commission Vice-President Josep Borrell-Fontelles*
- **Charlina Vitcheva** (Director-General, DG MARE)
- **Eivind Vad Petersson** (State Secretary of Norway)
- **Sara Olsvig** (Chair, Inuit Circumpolar Council)
- **Neil Gray** (Minister for Culture, Europe and International Development, Scotland)
- **Jasper Pillen** (Member of the Chamber of Representatives, Belgium)

The opening keynotes, mainly focused on EU, Scottish, Belgian, and Arctic perspectives on Arctic "futures", provided participants with a comprehensive introduction on Arctic challenges and prospects. To address these challenges, including the urgency of climate change, they all mentioned the need to include indigenous and youth perspectives in any policymaking related to the region, both at the regional and local levels. All speakers condemned Russia's unlawful invasion of Ukraine, highlighting its negative impact on Arctic cooperation and security.

 The first keynote speaker of the day was **Angelina Eichhorst**, speaking on behalf of High Representative and European Commission Vice-President **Josep Borrell-Fontelles**. In her speech, she emphasised the need for more effective multilateral cooperation and constructive dialogue between like-minded countries. Russia's unlawful invasion of Ukraine has put the European security order under threat, she argued, so it is important to develop international law and develop strategic foresight on security challenges in the Arctic. Considering multilateral cooperation as a fundamental way to address issues affecting the Arctic region, she highlighted the European Union's commitment to a safe, stable, sustainable, peaceful, and prosperous Arctic.

She also underlined the European Union's support for inclusive and sustainable development in the region, especially through job creation, which benefits all inhabitants and future generations whilst taking strong action to tackle climate change and environmental degradation.

Given the expected increase in demand for raw materials found in the Arctic, the European Union has established partnerships with its closest partners to adequately mitigate social tensions in the most contested areas where such resources are located by listening to and understanding the priorities of indigenous and young people.

 The second keynote speaker, **Charlina Vitcheva** DG MARE Director General, also focused on a European Union perspective on the Arctic. Beginning by emphasising the negative impact that Russia's unlawful aggression of Ukraine has had on Arctic cooperation, she offered an alternative threat to the Arctic region: climate change, as it has wide-ranging negative consequences, including biodiversity loss, pollution, food security, and economic challenges. Often overlooked, economic challenges should instead be countered in a variety of ways. For example, sustainable economic development and the availability of attractive jobs are essential to attract and retain talent, allowing people to not only live in the Arctic, but to thrive in it - both in urban and in rural areas.

Focusing on the European Union's Arctic Policy, she emphasised that these challenges will be addressed by giving space to science, research, and young and indigenous people's voices, promoting inclusive, fair, and sustainable development, and addressing those inequalities driven by depopulation and unbalanced economic growth. Keeping in mind that the Arctic is not a monolithic region, she stated the importance of ensuring and developing tailored approaches when drafting these policies.

Finally, she was happy to acknowledge a growing European Union presence in the Arctic, symbolised by a new Commission office in Nuuk that will open its doors in 2023.

 The third keynote speaker of the day was **Eivind Vad Petersson**, offering his perspective on the main challenges to the Arctic as State Secretary of Norway. As a Norwegian official, his focus is on working for a peaceful, stable, and prosperous Arctic,

addressing the impacts of climate change and the sustainable management of resources. Like Charlina **Vitcheva**, he underlined how the Arctic should not be considered as a single region, but that it should be referred to as the "Arctic regions" with big differences in climate development and demography between each region. Referring to North Norway in particular, which is home to 9% of Norway's population, he focused on the government's priority to further develop this area as a strong, dynamic, and highly competent region.

He also discussed climate change, emphasising how the Arctic is warming at four times faster than the rest of the world, stemming mainly from activities and emissions from outside the Arctic. As such, he said that it is everyone's responsibility to reduce global greenhouse gas emissions and recognized how long-term and serious investments in science and research are needed to understand the impacts of climate change and how to mitigate its consequences - all while ensuring that the rights and interests of indigenous peoples are protected.

Applauding Norway's close partnership with the European Union in projects like Horizon Europe and Erasmus Plus, he highlighted the need to cooperate in strengthening defence and security. In particular, he mentioned the coordination with NATO on military activities and support for Finnish and Swedish NATO membership will make the Nordic region more secure. He also highlighted existing platforms, like the Arctic Council, the Northern Dimension, and the Barents Euro-Arctic Council as effective platforms for discussion on decision-making in the Arctic, contributing to peace and stability.

With Norway expected to take over the chairmanship of the Arctic Council from Russia in May 2023, he remarked that the most important job of the Council will be to resume its contributions to scientific knowledge about climate change, sustainable resource management and the well-being of people living in the Arctic.


The fourth speaker of the day was **Sara Olsvig**, Chair of the Inuit Circumpolar Council, an organisation founded in 1977 with the purpose of strengthening the unity of the Inuit, promoting their rights, and representing them in the international arena.

Ms Olsvig shared a quote from Eben Hopson: "Inuit are an International Community sharing common language culture and a common land along the Arctic coast of Siberia, Alaska, Canada, and Greenland. Although not a nation-state, as a people we constitute a nation". The Inuit Circumpolar Council, throughout its 45 years of indigenous diplomatic efforts, has

successfully affected policymaking, calling for the recognition of the role of the Inuit and encouraging long-term policies to safeguard the Arctic environment and biodiversity.

“For us, the Arctic is not an unexplored Frontier for new Innovations of business developments or a token in climate change exemplified by the picture of a polar bear on a melting ice float,” she stated, "All this is real, and we live it.” For this reason, Ms Olsvig emphasised the importance of involving indigenous peoples at the forefront of Arctic policymaking and development, focusing on indigenous social, cultural, and spiritual well-being. She called for a human rights approach to Arctic development and climate change, considering peoples as indivisibly related to the environment and changing climate.

She concluded her speech by considering that the “Inuit have lived in the Arctic for time immemorial and we are in it for the long haul. We predate the invention of states and borders, and we will continue to be here. Therefore, we extend our hands for collaboration for strategic partnerships and for our common efforts to build a stronger future”.

 **Neil Gray**, Scottish Minister for Culture, Europe, and International Development was the next opening keynote speaker. As the world's most northerly non-Arctic nation, Scotland has become a regular contributor to Arctic dialogue across Europe over the last few years since the 2019 publication of *Arctic Connections,* Scotland's first Arctic policy framework. Illustrating the existing links and reflecting on shared challenges (particularly those stemming from climate change, rurality, and remoteness), and exploring avenues for even closer collaboration, this policy offers a perspective on issues that are relevant to both Scotland and the Arctic regions, emphasising the importance of Scotland's relationship with the European Union.

Offering alternative solutions to the climate crisis, Mr Gray shared how Scotland has set a target date for net zero emissions of all greenhouse gases by 2045. Having huge potential for renewable energy generation, hydrogen will play an important part in Scotland’s net-zero journey. Aiming to become a world leader in renewable hydrogen production, Mr Gray explained how Scotland is preparing to export this valuable fuel in collaboration with its Arctic partners as international demand for hydrogen grows.

He also displayed how Scottish-Arctic cooperation continues evolving, both through Scotland’s Arctic Connections Fund (which awards Scottish organisations to work with partners in the Arctic regions on a wide range of areas such as rural depopulation and

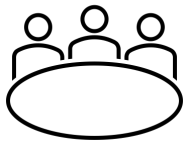
adjusting energy transition) and through the University of the Arctic Network (with Scotland increasing membership from two universities in 2019 to nine in 2022).

Mr Gray concluded by stating that despite Brexit, Scotland will continue to be a voice in favour of mutually beneficial cooperation and build the strongest possible relationships with the EU and the Arctic.

 The last keynote speaker of the day was **Jasper Pillen**, a Member of Belgium's Chamber of Representatives. Beginning his speech by highlighting Belgium's general absence to date in Arctic policy making, Mr Pillen switched to a very positive outlook focusing on the role that Belgium can play in the region. Having drafted an Arctic strategy then approved by the Belgian parliament, he is hopeful that Belgium has a bright future in Arctic policy making.

Identifying Belgium's strengths and assets to offer an effective contribution, he highlighted the country's excellence in polar scientific research dating back 125 years to Adrien Gerlache's first overwintering expedition in Antarctica. While Belgian polar research was at first mainly focused on Antarctica, there is now an increasing interest in Arctic research. For example, 12 research groups based at eight Belgian universities are currently active in Arctic scientific research. Also in 2022, Belgium was accepted as the 24th member of the International Arctic Science Committee (IASC), and just before summer 2022 the new Arctic research vessel *Belgica* was baptised. In 2023, this vessel will sail to Greenland to conduct marine and biology research.

Concluding his speech by stating that "what happens in the Arctic does not stay in the Arctic" he highlighted the importance of a collective duty to collaborate in protecting and preserving the Arctic region.



PANEL 1: EVOLVING ARCTIC GOVERNANCE

- **Moderator:**
    - **Mike Sfraga** (Chair, U. S. Arctic Research Commission)
- **Speakers:**
    - **Morten Høglund** (Senior Arctic Official, Norway)
    - **Thomas Winkler** (Arctic Ambassador, Kingdom of Denmark)
    - **Urmas Paet** (MEP, Estonia, Renew Europe Group)
    - **Samu Paukkunen** (Deputy Director, Finnish Institute of International Affairs)
    - **Elle Merete Omma** (Head of EU Unit, Saami Council)

 **Mike Sfraga** introduced the panel by recognizing the Arctic's new geopolitical landscape considering Russia's unlawful aggression of Ukraine, hampering decades-long cooperation on matters that are far from being resolved. The continuing "global heating" caused by climate change is real, rapid, and relentless, with destructive consequences in the Arctic. As seven like-minded Arctic nations (the Arctic 7) decided to put official meetings of the Arctic Council on hold, the panel has been asked to address this key question: Is a new governance paradigm emerging in light of the current geopolitical tensions?

To kick off discussions, **Mike Sfraga** asks speakers the following question:

- *Is the Arctic Council functional, is it needed, or is it dead?*

 **Morten Høglund** was the first to reply. He believes that the Arctic Council is not dead, and it is still needed. He considers the value of the council as beneficial not only to the Arctic

region but also to the rest of the world. The Arctic Council still functions as a multilateral tool for discussing and solving issues in the Arctic. Despite the interruption of official meetings, all existing projects that do not involve Russian participation have been restarted.

As Norway will be taking on the chairmanship of the council in May 2023, constructive business-like dialogue with Russia has been necessary to find a model for transition and the future work of the council. Though business as usual is not an option, there is no pause on climate change and biodiversity loss in the Arctic. As such, activities and cooperation are needed.

 **Thomas Winkler**, the second speaker to reply, provided a clear distinction between security policy and matters like climate change and socioeconomic development - what he calls the "truly important matters". While there may be other governance structures emerging for security policy, the Arctic Council is still considered, by all eight Arctic states, as the main structure dealing with the "truly important matters". According to Mr Winkler, the distinction between these different matters is important because the Arctic is not only a matter of security policy. The Arctic Council's focus on climate change and inclusion of indigenous peoples in the decision-making process allows it to accurately keep in mind the interests of Arctic states and indigenous peoples.

 According to **Samu Paukkunnen**, there is no returning back to the old golden days of Arctic cooperation and exceptionalism following Russia's unlawful aggression of Ukraine. For this reason, Mr Paukkunnen believes that the "Arctic Seven" should double down on cooperation, making sure to conserve the decades-long acquisition of knowledge, connections and cooperation characterising the work of the Arctic Council. This work is necessary to envisage a return to cooperation at some point down the line.

According to Mr Paukkunnen, the Arctic Council should be preserved through diplomatic efforts, it's an organisation no Arctic state (including Russia) can afford to lose. Referring to a return to the Arctic Council's activities, he concludes by saying "If there is a will, there is a way. And I know there is a will".

The fourth speaker to answer the question was **Urmas Paet**. Following Russia's unlawful aggression of Ukraine, he considered how the future of the Arctic Council must now rest on the seven remaining Arctic countries that uphold international law and human rights. According to Mr Paet, the Arctic Council should swiftly exclude Russia from its cooperation, as did the G7 following Russia's annexation of Crimea.

Mr Paet believes a future return to cooperation with Moscow is possible only following a total regime and societal change in Russia, effective reparations to Ukraine, and enforcement of international justice. Mr Paet argues that, like Nazi Germany did following World War II, Russia should have to pay for its mistakes before resuming cooperation with Europe and the rest of the world. Waiting until the war ends is not enough.

As the last speaker to offer her contribution, **Elle Merete Omma** offered an Arctic indigenous perspective. Though the Arctic is currently living under exceptional times, she mentioned how indigenous peoples have been living under exceptional times for centuries, having to coexist with many different visitors on their traditional land. Climate change is not on hold and the geopolitical situation is putting more pressure on indigenous peoples.

While she mentioned that the Saami Council has stopped cooperation with Russia on every official matter, indigenous peoples currently living in Russia are paying the price of Western sanctions, which heavily affect them. This puts the Saami Council in a very difficult moral position.

Despite these geopolitical challenges, Ms Omma truly believes in the importance of the Arctic Council as a western and indigenous peoples' knowledge production institution. As many of the Arctic Council's activities are currently on hold, it has now become hard to engage in people-to-people collaboration dealing with life in the Arctic.

Questions from the audience:

- *A representative from the UK Foreign and Commonwealth Office asked whether there might be a downside to international foreign policy discussions at the Arctic Council.*

Thomas Winkler replied that there's never a downside to discussions at the Arctic Council. However, he believes that recommendations regarding Arctic challenges should come from the Arctic states involved. While all observer countries and working groups are welcome to discuss the Arctic, the choice ultimately rests on Arctic states.
According to Samu Paukkunen, cooperation between Western Arctic countries is absolutely necessary during these difficult geopolitical times. Not including Russia in this cooperation is also necessary to send a message.

Urmas Paet also considers it important to not involve Russia in any cooperation resulting from the Arctic Council. He also recommends carefully examining the interests of certain observer states (i.e. China) during this geopolitical crisis.

According to **Morten Høglund**, though the Arctic Council can be changed and improved, the geography of the Arctic will remain the same. According to him, Russia will still be part of the Arctic and should be included again in cooperation once the war is over. Like Elle Merete Omma, Mr Høglund believes that the Arctic Council exists first as a knowledge production organisation where scientific cooperation is key, even with countries one doesn't politically agree with. According to him, it's in the interest of all people living in the Arctic to cooperate, including states and indigenous peoples.

Elle Merete Omma also applauded the Arctic Council's ability to include indigenous peoples in arctic governance structures, thus making a difference at the local level.

- *A student from the College of Europe asked if more focus should be put on Arctic conferences under the current circumstances.*

Mike Sfraga replied to this question first, mentioning how Arctic conferences are fundamentally different from the Arctic Council. The latter takes on issues, enables actions and activities, feeds into our data and understanding of the North, and has been critical to negotiate several binding agreements among Arctic nations. However, Dr Sfraga still believes that Arctic conferences are important to engage in Arctic discussions and raise awareness on a global scale.

Thomas Winkler agreed and pointed out that decision-making is only made at the Arctic Council, among its member states and permanent participants.

- *The same student asked how the panel sees the economic perspective within the Arctic Council's governance evolving.*

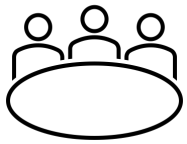
Thomas Winkler replied first, stating that economic development has not been that high on the council's agenda, as it's traditionally been left to Arctic governments to ensure their countries' economic development.

According to **Samu Paukkunen**, the Arctic Council has done a great job thus far to create a framework for sustainable companies to operate in the Arctic.

Elle Merete Omma replied last, considering how the Arctic Economic Council has put increasing pressure on indigenous peoples and how the Arctic Council, for indigenous people, remains the best source of cooperation.

Reflections from the moderator:

To conclude the panel, **Mike Sfraga** provided a reflection on the main issues that emerged during the panel: there will be no new frameworks replacing the Arctic Council. The Arctic Council remains important, especially in focusing on a kaleidoscope of different priority issues and addressing a region that is going through dramatic change.



PANEL 2: ARCTIC COOPERATION IN TURBULENT GEOPOLITICAL TIMES

- **Moderator:**
    - **Andreas Østhagen** (Senior Research Fellow, Fridtjof Nansen Institute)
- **Speakers:**
    - **Clara Ganslandt** (EU Special Envoy for the Arctic, European External Action Service)
    - **Petteri Vuorimäki** (Senior Arctic Official; Ambassador, Arctic Affairs - Ministry for Foreign Affairs, Finland)
    - **Kathleen Larkin** (Arctic Security Officer, US Department of State)
    - **Ronald Wærnes** (Deputy Head of Troms and Finnmark County Government)

Andreas Østhagen introduced the panel by defining its scope: Arctic security among current geopolitical tensions. Dr Østhagen pondered what future Arctic cooperation will look like, considering the recent exclusion of Russia by the Arctic Seven. He also considered the importance of distinguishing between different Arctic sub-regions to accurately understand the political dynamics governing the Arctic. Giving the floor to the speakers, he introduced them by emphasising that they will offer different approaches to dealing with governance in the Arctic, depending on where they are from.

Clara Ganslandt was the first speaker to offer her perspective. Russia's unlawful aggression of Ukraine has forced Arctic states to take a renewed look at Arctic cooperation. However, she argues that the Arctic's turbulent situation also depends on factors other than Russia.

The first factor, according to Ms Ganslandt, is climate change. Given the great impact of permafrost thawing on infrastructure, biodiversity, food security, climate change is something that needs to be tackled at the global level.

The second factor is the presence of very attractive resources in the Arctic region (i.e. fish, oil, gas, minerals, tourism…), especially with the expected increase in demand for raw materials essential for the green transition (i.e. batteries, hydropower…).

The third factor is competition for land use, especially the consequences of major industrial projects on the livelihoods of Arctic residents and indigenous peoples.

The fourth factor is the lack of functioning social structures, including healthcare and social services.

She concluded by emphasising that, while matters of hard security are very important, all these factors should be kept in mind when talking about Arctic issues.

 **Petteri Vuorimäki** structured his contribution into three main points: Arctic Council, security, and the European Union.

Firstly, he emphasised that the Arctic Council is neither dead, nor is it likely to die. The transfer of chairmanship from Russia to Norway will allow the Arctic Council to carry on with its important functions.

Secondly, he considers that, while hard security will inevitably require more attention, the Arctic is currently shaken by other threats and challenges that are of utmost importance. While climate change remains the main threat, sustainable economic development is also a challenge deeply impacting the Arctic region. As such, Mr Vuorimäki wishes to emphasise that the Arctic is not a region made of ice, people live there, and people's wellbeing needs to be a priority.

Thirdly, the European Union's Arctic policy has come a long way from the time it considered the Arctic as an inhospitable place. He was very happy with the EU's Joint Communication published in October 2021, arguing that the Arctic should be a higher priority in EU discourse and institutions.

The third speaker of the session was **Kathleen Larkin**, offering a unique perspective on how the United States hopes to navigate these turbulent times. She emphasised that the United States has an obligation to uphold and double down on the rules-based international order that has brought peace and stability for decades. This is built on core values: sovereignty, accountability, and human rights.

Like many other speakers, she considered how the Arctic Council is indeed alive, continuing its work with 60% of its projects having restarted. She is also wary of talks considering the Arctic at risk of becoming a "global commons". Since the Arctic is a well governed region, with most of the region being governed by national jurisdictions, she thinks it is unlikely that we'll see a run for Arctic natural resources.

She then focused on Arctic security, considering the importance of strengthening existing bodies rather than introducing new structures. With the potential accession of Finland and Sweden to NATO, she applauded that seven out of eight Arctic states will be part of the NATO alliance, thus closing any grey zones in the Arctic and fostering more direct cooperation.

Ronald Wærnes demonstrated how cooperation with Russia has changed during these difficult geopolitical times. Opening new opportunities for further cooperation, he explained how Norway is strengthening its cooperation with Finland, Sweden, and the European Union.
While the Troms and Finnmark County Government has been doing business with Russia for many years, most governmental cooperation with Russia has now ended and is now limited to basic administrative contact. For example, cooperation in search and rescue in the Bering Sea has been maintained.

Mr Wærnes also introduced the energy topic to the discussion, arguing that EU cooperation has become indispensable in this area. Given the common responsibility to deliver on the Green Transition, cooperation on these matters is of great importance.

Mr Wærnes also argued that the pending NATO membership of Sweden and Finland brings us closer than before. The Arctic needs good and reliable connections both east-west and north-south in the region.

Questions from the moderator:

- *The moderator asked the panellists to give their perspectives on two main subjects: the EU's role in maintaining peaceful geopolitical relations in the Arctic region, and different approaches to neighbour-state communication with Russia.*

Clara Ganslandt replied that the EU's priorities and strengths in making the Arctic stable are outlined in the Joint Communication adopted in October 2021. The EU also finances other initiatives focusing on the importance of scientific research for security and sustainable development in the Arctic.

Petteri Vuorimäki answered that while there are certain situations in which Russian cooperation is necessary, beyond these the "Arctic Seven" will find a way to make an informed decision on when or if to cooperate.

Kathleen Larkin said that the United States has a long maritime border with Russia and indigenous people spanning the Bering Sea. Though communication with Russia has been challenging, Ms Larkin explained that it has been kept at the highest levels (i.e. chiefs of defence, secretaries of defence…) and sometimes at lower levels (i.e. coast guard). These tensions require Arctic allies to invest more in defence and deterrence and exercise jointly to be interoperable and responsive. This will contribute to a more stable environment, demonstrating resolve and unity.

Ronald Wærnes offered some good examples of past cooperation between Norway and Russia. Before February 24th, 2022, Russia and Norway were able to clean up most nuclear waste in Andreeva Bay. Mr Wærnes also argued that cooperation and common interests inevitably contribute to lowering tensions and inspiring real change. Though he believes that one decade of cooperation with Russia has been lost, there needs to be hope and faith that cooperation will resume in the future.

Questions from the audience:

- *A student from the College of Europe asked how can the EU ensure coherence in its different policy areas?*

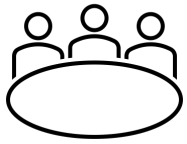
Clara Ganslandt attempted to clarify the apparent incoherence in EU Arctic Policy. The October 2021 Joint Communication, emphasising the importance of keeping gas and oil and coal in the ground, apparently conflicts with the current energy security situation. Ms Ganslandt clarified that while there is an urgent need to see effective reductions of greenhouse gases, there is now a more urgent need to shift away from the dependence on Russia and Russian suppliers of energy. Therefore, she considers that though energy security will prevail in the short term, the long-term ambition remains to attain zero emissions by 2050.

- *An academic from Paris asked whether China could help in Arctic cooperation and if there are any suspicions in working with them.*

Kathleen Larkin replied first to the question by stating that the United States frames China as a strategic competitor in the Arctic. The United States recognises China's Arctic ambitions, they are an Arctic Council observer state and they've done significant work in polar research. However, concerns remain about China's predatory economic investments in the Arctic region.
Ronald Wærnes agreed with Ms Larkin. Given the Arctic's minerals, natural resources and sources of energy, China can become a potential player in these fields.

- *A student from Poland asked if there are any alternatives to Russian gas dependence.*

Kathleen Larkin focused her reply on the Green Transition, warning that it would be dangerous to trade one dependency on a single state for another dependency on another single state. In this case she refers to China, as most rare minerals necessary for the Green Transition are treated there.



PANEL 3: EVOLVING ROLE OF ARCTIC STAKEHOLDERS

- **Moderator:**
    - **Marie-Anne Coninsx** (Former EU Ambassador at Large for the Arctic; Fellow, Egmont Institute; IPF Board Member)
- **Speakers:**
    - **François Delhaye** (Director, Directorate of Economic Affairs, Belgian Ministry of Foreign Affairs)
    - **Sólrún Svandal** (Senior Advisor on Arctic Affairs, Ministry for Foreign Affairs of Iceland)
    - **Geneviève Brisson** (General Delegate, Québec Government Office in Brussels)
    - **René van Hell** (Director, Arctic Ambassador, Ministry of Foreign Affairs, the Netherlands)
    - **Melody Brown Burkins** (Director, Institute of Arctic Studies, Dartmouth University; UArctic Chair in Science Diplomacy and Inclusion)

 **Marie Anne Coninsx** introduced the scope of the panel, presenting how it will touch on the topics of Arctic governance and cooperation in turbulent geopolitical times from the viewpoint of Arctic stakeholders. Ms Coninsx defined what Arctic stakeholders are: they are not only Arctic states, but also all international organisations and entities, including non-Arctic states that have an interest in the Arctic, that are observers of the Arctic Council and that contribute to the wellbeing of the Arctic and its people.

The main questions she sought to answer by the end of the panel include:

- Has the role of non-Arctic stakeholders been evolving?
- What can these non-Arctic stakeholders bring to the table?
- Is the current geopolitical turmoil an opportunity for better governance and for a bigger role of non-Arctic stakeholders?
- How can Arctic stakeholders contribute to larger inclusiveness of non-Arctic states?

After this introduction she proceeded to ask each speaker a series of specific questions.

- *Why is the Arctic so important to Belgium?*

 **François Delhaye** replied to this first question beginning by emphasising Belgium's long tradition of polar research. First focusing on Belgium's competences in Antarctic research and exploration starting with the first overwintering research expedition aboard the Belgica in 1898-99, Belgium recently realised that, given current circumstances, it needs a more structured research approach to the Arctic. For this reason, Mr Delhaye explained that there has been a bigger push to develop a Belgian Arctic strategy focused on three main points: an increased Belgian contribution to polar research (e.g. through its expertise and tools); an interest in Arctic economic opportunities (e.g. consequences of thawing ice for trading routes; security, especially considering the evolving geopolitical situation.

Mr Delhaye concluded by stating that Belgium wishes to further develop its friendly ties with various Arctic regions.

- *What is the role of observer states in the Arctic Council during the current pause? Is there an opportunity for an increased role of non-Arctic observer states in the Arctic Council?*

 **Sólrún Svandal** observed that, when she was part of Icelandic Chairmanship of the Arctic Council (2019-2021), many efforts were made to include observer states and increase their participation in the Arctic Council. According to Ms Svandal, observer states have an incredible potential for contributing to the work of the body.

She said we should consider the importance of focusing on what we can do within the framework of the Arctic Council instead of what we can't do. Even during these turbulent geopolitical times, all Arctic Seven countries see the Arctic Council as the preeminent forum for intergovernmental Arctic cooperation. Ms Svandal also considers that the cooperation

from the Arctic Council's 38 observer states clearly demonstrates the body's relevance and contradicts the title of an exclusive club of a select few.

Ms Svandal concluded by emphasising the need to focus on the work of the Arctic Council's new strategic plan. As climate change hasn't been paused, we need an all-hands-on deck approach to solving the crisis.

- *How can you see the current situation as an opportunity to stimulate the role of non-Arctic states in the Arctic Council? How would Québec like non-Arctic observer states to contribute to the Arctic file?*

 **Geneviève Brisson** emphasised the great value that a wider cooperation has for Québec. While Québec's territory is not in the Arctic, given the province's northern regions and its sizable Inuit population, Ms Brisson underlined Québec's deep involvement in Arctic issues.

This external involvement is important, according to Ms Brisson, as what happens in the Arctic doesn't stay in the Arctic and has global implications (e.g. climate change). She affirmed that collaboration cannot be stopped; we need more people at the table working together to offer different solutions and expertise.

- *How do you see the role of observer states and non-Arctic states evolving in the current times? How can the Netherlands contribute to the work of the Arctic?*

 **René van Hell** replied that, to make a useful contribution as an observer country, there needs to be a double approach. On the one hand, one should be involved in discussions over appropriate policies (e.g. on climate change). On the other hand, one should have an ability to effectively contribute to putting these policies in place.

Mr van Hell then shared a concrete example on how the Netherlands contributed: summer 2022's Dutch scientific expedition to Svalbard came back with many interesting findings on climate change, biodiversity, and migratory patterns of birds.

In short, Mr van Hell considers that observer countries must find ways to have an interesting conversation and to give an interesting contribution to the members of the Arctic Council.

- *Under the current circumstances, how is science-diplomacy being affected? How can it advance in the current situation?*

 **Melody Brown Burkins** emphasised the importance of science diplomacy, recognising the Arctic's approach to science diplomacy is an example for inclusion everywhere else in the world. She recognised the importance of respecting and including different knowledge systems (e.g. indigenous knowledge systems) in addition to the traditional Western scientific systems. According to Dr Burkins, this is necessary in order to ground science in the people, connecting it to international relation issues, power, and politics.

Replying to the first questions, stating that science diplomacy has indeed been affected by the current geopolitical situation, hoping that cooperation with Russian counterparts can come back in the future, but only when they will start respecting criteria for inclusive, ethical, and sustainable systems in the Arctic.

Dr Burkins replied to the second question by proposing that science diplomacy can move forward only by investing in existing structures and strengths, the Arctic Council being one of them. She believes that it is time for scientists, policymakers, and researchers around the world to work much more with indigenous knowledge and indigenous knowledge systems, making sure that the future of international Arctic research and science diplomacy is informed, equitable, sustainable, and prosperous.

 **Questions from the moderator:**

- *How can the Arctic benefit from Belgium's engagement?*

François Delhaye explained that Belgium doesn't expect to change the Arctic by itself. Rather, it will have a double approach focusing on both science - by bringing the expertise (research) and tools (e.g., Belgica) to tackle Arctic challenges-, and cooperation - engaging with like-minded partners, making sure that whatever happens in the Arctic preserves our common global environment-.

- *How can Arctic states promote the role of non-Arctic states outside of the Arctic Council?*

Sólrún Svandal clarified that the focus should be on more than just observer states and non-Arctic states, but also on other stakeholders. Ms Svandal shared the example of the EU and other regional platforms, which have very important programs related to the Arctic.

In these troubled times, she believes that continued cooperation between Arctic states and Arctic observer states within NGOs and IGOs is a steppingstone to keep the Arctic collaboration on course.

- *Do you have any recommendations for Belgium to develop its Arctic strategy? Are there any specific areas that it should concentrate on?*

Geneviève Brisson said that she's glad that Belgium is joining this effort and believes that Belgium will be able to contribute to Arctic cooperation in many different ways. Her recommendations are twofold:

Firstly, it is important to collaborate with indigenous communities and make use of their knowledge and life experience.

The second recommendation involves the need to have a plan - a vision of the collaboration that Belgium wishes to have in the Arctic.

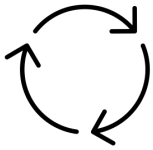
- *How do you evaluate the inclusiveness of Arctic stakeholders in the Arctic file?*

Melody Brown Burkins believes that this inclusion is focused on the inclusion of knowledge systems and indigenous people's knowledge, their voices, and the inclusion of all genders in the systems we create for both science and governance. Dr Burkins believes that there is a twofold responsibility: a responsibility from the ones that would like to be more included and the responsibility to include them.

Questions from the audience:

- *A student asked why include only Western and indigenous perspectives when talking about inclusivity? Why don't we consider more Eastern and Russian ways of doing science?*

Melody Brown Burkins replied that the reason for the current exclusion of these perspectives is based on a breach of trust and sovereignty that cannot not be accepted. While she hopes that this inclusion can come back, exclusion is now necessary to show what kind of cooperation the Arctic wishes to have.



SUMMARY OF DAY 1:

- **Willfred Nordlund** (Vice-Chair, Arctic Delegation, Norwegian Parliament)

Tasked with concluding an intense afternoon of discussions, **Willfred Nordlund** offered a concise summary of the main points that were brought up:

- Considering Russia's unlawful aggression of Ukraine, cooperation will only be possible in the future with a different approach.

- Current administrative and scientific bilateral contacts between Russia and other areas give hope for the future. While there might be challenges ahead of us, there are also opportunities to solve these issues and make the future brighter.

- From an indigenous perspective, we should be careful not to speak in “they-them” terms. As we are all in the same boat, we must discuss together on how to solve our common problems.

- The Arctic Council still remains the key body for Arctic cooperation.

- Arctic discussions must increase, especially on climate and resource issues.

- The polar regions are magnets for pollution coming from other areas of the world. In this sense, it is important to understand that the problem is not necessarily in the region itself, but they can be one of the first regions to notice these challenges.

Mr Nordlund concluded by arguing that cooperation, especially in these times of conflict, is important. Meeting new challenges will bring new possibilities and friendships.

Wednesday, November 30th

OPENING KEYNOTES

- **Lars Haltbrekken** (Chair, Arctic Delegation, Norwegian Parliament)
- **Gizem Eras** (Counsellor and Head of Section for Agriculture, Fisheries, and Environment, Mission of Canada to the EU)

Lars Haltbrekken took the audience back to 1988, when he was only 17 years old and read news about acid rain and the hole in the ozone layer. Forests were dying because of pollution. These issues made him worried about the future, but he also believed that if we fought this problem together, we would be able to solve it. He became a member of an environmental youth organisation back in Norway and worked with the environmental movement for many years before he became a member of the Norwegian Parliament.

Today, his children don't have to worry about acid rain or the hole in the ozone layer as the global community came together to solve these issues. However, they do have to worry about climate change and how it is dramatically changing our planet. He believes, like when he was 17 years old, that we can solve the climate crisis if we have the will and stand together. We know what the problem is, we have the technology to fix it, we can afford it, and we still have time. The only think he believes that we lack is political leadership. The global climate crisis can only be solved by a common global effort.

Mr Haltbrekken also considered that, in addition to a global agreement, we need regional initiatives to curb global warming. Arctic cooperation has done incredible work in mapping out emissions of short-lived climate pollutants (i.e. black carbon) in the Arctic. Cutting black carbon emissions will have a more immediate impact on the melting of snow and ice compared to CO2 which stays in the atmosphere for many decades. We also know that regional cuts have regional effects. This means that if we manage to cut emissions in the Arctic, this will reduce Arctic climate change. Furthermore, we know that reduced emissions

will be good for human health. For this reason, he believes it essential that governments work with scientists to develop renewable energy solutions for different Arctic communities that are still relying on diesel as their main source of energy. If we can make an off-grid solution work well in the Arctic, it is likely that we can make it work elsewhere too.

He also put an emphasis on how indigenous Arctic peoples such as Saami and Inuit speak about climate change from a human rights perspective, recognising how much global warming has been impacting their traditional way of life and culture. That's why, even he believes that we need more renewable energy, we can't build it in a way that violates the human rights of indigenous peoples.

Mr Haltbrekken paid tribute to the leadership role that the EU has taken on energy and climate issues. The EU is an important force for improved and ambitious policies in global meetings such as the recent COP 27 in Egypt and the upcoming COP on biodiversity in Montreal. Together, he believes, we need to find common ground with countries with which we disagree on many important issues, including human rights, if we want to save our planet.

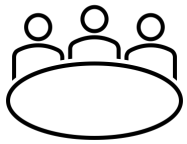
 **Gizem Eras** addressed the current geopolitical challenges and complexities that risk undermining the history of peace and cooperation in the Arctic. Canada condemns Russia's unjustifiable and flagrant actions against Ukraine and looks forward to the upcoming Norwegian Arctic Council Chairmanship, moving forward on projects and priorities.

Ms Eras considered how much the Arctic is central to Canada's national identity, to its prosperity, security, values, and interests. Its rich history and culture are fundamental to Canada's social fabric. The wealth of resources and biodiversity that the Arctic region holds, with the influence of changing climate and increased activity in the region, will be the first to show the impacts of our decisions. For this reason, Canada is committed to making policies and investments to ensure that northern communities, livelihoods, and ecosystems will continue to thrive.

She also spent a few words on the Arctic Council which, according to her, remains the main forum for Arctic cooperation. Though many of its projects are currently on pause because of Russia's flagrant actions, she believes it important that the work of the Arctic Council continues where possible.

Ms Eras also illustrated Canada's Arctic policy seeking to engage an enhanced circumpolar and north-to-north connection among youths, resolving outstanding boundary issues, and seeking advice from local and indigenous experts in areas that have a direct impact on their communities.

Ms Eras finally accentuated that the main challenge facing the Arctic and its people is not geopolitical posturing, but climate change. Protecting biodiversity and ensuring the sustainable livelihoods of those who live there are key priorities for Canada. As discussions delve into the future of Arctic cooperation, including with key non-Arctic partners such as the EU, it is important to also innovate ways to support sustainable development, address impact of climate change, and protect biodiversity of the Arctic region. She believes it essential to work together to ensure that the northernmost communities and people can thrive despite actions taking place elsewhere in the world.



PANEL 1: ARCTIC RESEARCH COOPERATION IN THE CURRENT GEOPOLITICAL SITUATION… AND BEYOND

- **Moderator:**
  - **Johanna Ikävalko** (Director, Arctic Centre, University of Lapland)
- **Speakers:**
  - **Rasmus Leander Nielsen** (Assistant Professor, Institute of Social Science, Economics and Journalism, Ilisimatusarfik)
  - **Nicole Biebow** (Project Manager, EU PolarNet, Alfred Wegener Institute)
  - **Peter Sköld** (Professor of History, Sami Culture, and Society Development at Umeå University)
  - **Veli-Pekka Tynkkynen** (Professor, Aleksanteri Institute - Finnish Centre for Russian and East European Studies)
  - **Mike Sfraga** (Chair, U. S. Arctic Research Commission)
  - **Karen van Loon** (Junior Researcher - European Programme, Egmont – Royal Institute for International Relations)
  - **Ana-Maria Stan** (Policy Officer - Healthy Oceans and Seas/Polar Research, DG RTD)

Johanna Ikävalko introduced the panel as a discussion on how the current geopolitical situation has changed Arctic research. Since cooperation with Russian organisations and researchers has been put to a halt, Dr Ikävalko emphasised the current challenge of seeking opportunities and alternatives to study the Arctic without Russian counterparts.

She asked each of the panellists to respond to the following question:

- *How has the changed geopolitical situation affected your work?*

Rasmus Leander Nielsen explained that this is the most significant disruption to Arctic research cooperation in decades. During the Cold War there were periods of greater research cooperation with the Soviet Union than now. While it's normal to put a pause to Arctic Council cooperation and Arctic research collaborations in the short run, over the long run it will be necessary to start working with Russia again. There's a lot of knowledge on the Russian side to be gained and collaborations with the next generation of Russian researchers needs to be established. Once we get past the short-term "stumbling blocks", we need to find solutions to make research cooperation possible again.

Nicole Biebow stated that Russia had been one of the main research cooperation partners for the Alfred Wegener Institute (AWI) in Germany since the fall of the Berlin Wall in 1989. Focusing on natural sciences, AWI has had several projects with the Russians put on pause due to the current situation, including: a joint research station in the Lena River Delta in Russia observing thawing permafrost and carbon balances; a joint laboratory in Saint Petersburg to train Russian PhD students and analyse field samples; a joint master's programme with Saint Petersburg State University to educate students in polar marine research

Losing access to nearly half of the research area of the Arctic is a huge loss for understanding the processes of climate change in the Arctic. Not only has scientific research been affected, but also students. Fifteen PhD students won't be able to finalise their PhD theses due to the ban on publishing research data from Russian scientists.

Due to the long research cooperation between Germany and Russia, several personal connections had been established. Many Russian-German couples were formed as a result. People are worried. Russia supported the MOSAIC Expedition, which included 20 countries and 450 scientists during the COVID pandemic. Over the coming years we won't be able to do major international research initiatives like MOSAIC, which we need to understand what's happening to the Arctic climate. Climate change won't stop due to the geopolitical situation. We should at least try to re-establish low-level scientist to scientist cooperation.

Peter Sköld of Umeå University highlighted his long career in international Arctic research cooperation. He explained that while some work in the Arctic Council working groups has re-started on a limited basis, the Barents-Euro Arctic Council (BEAC), where Russia is a major partner, is still on pause. This is sad for regional cooperation and development in the Barents Region, which the BEAC has been fostering over the last 30 years.

International research organisations such as the University of the Arctic, which has introduced Russian researchers to international networks and coordinated exchange programmes with Western universities, have also been affected. It will be difficult to determine how this research cooperation could be developed again soon. Even the planning for a potential International Polar Year in the early 2030s has been put on hold, as well as the I-Corps 4 process.

Trust has also been affected. For a long time, Europe has found ways to work with not only Russia but also with other non-democratic countries such as China. That cooperation has been built on trust, but this trust is being put to the test. Hopefully there will be a way forward.

Veli-Pekka Tynkkynen acknowledged that research cooperation has been affected in all three areas where he works: Russia, climate, and energy. Prior to Russia's invasion of

Ukraine, his research team worked with three Russian scholars in Saint Petersburg who have since fled Russia, which has allowed Professor Tynkkynen's team to continue its work.

As a scholar looking at geopolitical and energy security issues, he saw that the Russian academic community was genuinely interested in research cooperation on climate change. However, he believes that Putin's regime has used the Arctic cooperation to build a sort of "camouflage" to be in an inter-dependency frame with Europe. The same was done for energy policy. Russia for decades said, "Don't mix geopolitics and energy policy; they're not interrelated." But actually, geopolitics and energy policy *are* interrelated, and now we see the consequences.

In the same way, the academic community in the Arctic doesn't exist in a bubble; it's affected by the same geopolitical factors as any other sector. It's important to discuss how it's going to

be possible to establish interconnections and cooperation in the future while not being too naïve.

Mike Sfraga explained that the US Arctic Research Commission represents not just the US Arctic research community, but it works internationally with partners from across the globe. He and the other six presidentially appointed US Arctic Commissioners must think of a way forward through the current reality. It's not possible to change what's already happened and we can't ignore a war that's happening in Europe.

Under the current geopolitical situation, the US is trying to move forward where it can, where it should, and where it needs to be. The US has been building over the past year a set of goals for Arctic research that inform where the US goes in the coming two to five years. This has been informed by discussions that have been going on related to the US National Strategy for the Arctic Region. There are four pillars in the US National Arctic Strategy. The five goals of the US Arctic Research Commission compliment and enable those four pillars in varying ways.

Where the US would have been discussing with Russian colleagues in bilateral or multilateral settings, the US is doubling down on what can be done for the US, and a big component of that is working with colleagues in the North and elsewhere about and for the North.

Dr Sfraga then tied the four pillars in the US National Arctic Strategy to the five goals of the US Arctic Research Commission. The four pillars of the US National Arctic Strategy are: security (which includes not only hard security, but also community security, food security, water security, health security, etc.); climate change and environmental protection; sustainable economic development; international cooperation and governance.

As Chair of the US Arctic Research Commission, Dr Sfraga must reinforce and influence what happens in these four areas related to research and rely on colleagues in the North to advance not just the interests of the US but our collective interest through the five goals of the Research Commission, which are: advancing research in areas of environmental risks and hazards; community health and well-being (part of a vision that reflects the needs of Arctic communities); infrastructure (not only for the US but for the global Arctic); economic research (the economies of the North and how you build those economies); research cooperation (at all levels, all components of research).

The US has had the same impacts on its research community as Europe. So, the US will look to marry the two areas mentioned for not only the US but also for allies, partners, and nations in and outside the Arctic.

Karen van Loon from the Egmont Institute gave the perspective from the Belgian scientific research community in light of the current geopolitical situation. This includes not only Belgian universities but also the Belgian Federal Science Policy (BELSPO).

Reminding the audience of Belgium's 125-year tradition in polar research, Belgium currently has twelve research groups at eight Belgian universities active in Arctic scientific research. Since 2015 their research has resulted in over 190 academic publications, and in 2022 Belgium was accepted as the 24th member of the International Arctic Science Committee (IASC). Both the Belgian government and the Belgian scientific community condemn Russia's invasion of Ukraine.

As Belgium is a member of the EU, decisions regarding scientific collaboration align with the EU, which means institutional cooperation with Russia has been halted. Partnerships with the Russian Science Foundation have been severed and there will be no calls for joint research proposals. There is no Belgian funding for Russian or Belorussian partner institutions. Travel of students or researchers to either of these countries can no longer take place in the current situation.

While structural research cooperation with Russian institutions cannot take place under the current circumstances, the Belgian research community understands that many Russian academics don't share the views of their government. Belgian universities leave it up to individual researchers whether to continue their contact with counterparts in Russia. This is what Belgian Arctic researchers are doing for the time being. Students who choose to study at Belgian universities are still welcome, as Belgian universities don't want to make individual Russian students victims of their regime.

Ms van Loon ended her comment with a rhetorical question: There is clearly a need to understand, monitor, combat and adapt to climate change in the Arctic. Given the gravity of the situation, is it legitimate to place moral objections to Russia's behaviour above a pragmatic solution to the global problem?

Anna Maria Stan from DG RTD at the European Commission echoed the comments of her colleagues on the panel that it is a pity that nearly half of the Arctic is gone from research cooperation if Russia isn't taking part.

Following Russia's invasion of Ukraine on 24 February 2022, Western heads of state made the decision to stop all cooperation with Russian entities in all domains. This affected many of the Horizon 2020 projects that were still running and the new Horizon Europe programme. This meant that all Horizon projects had to terminate their cooperation with Russian partners.

International cooperation is a priority for Arctic research supported by the European Union. Horizon projects are a good instrument for this because they're open to the entire world, and they involve all the Arctic countries and countries involved in Arctic research.

Citing some examples, Ms Stan talked about how EU Arctic research supports the EU Green Deal, as many projects look at climate change and finding solutions to the problems it presents. Projects looking at permafrost thaw, for example, no longer have access to data from Russia, which is home to a significant amount of the world's permafrost.

The same is true for Arctic observations in general. Ensuring long-term governance for Arctic observations is one of the aims of the Arctic Science Ministerial - another process that has been disrupted (Russia and France were to co-host the Arctic Science Ministerial in 2023).

Nonetheless, it doesn't mean that we shouldn't keep thinking of ways to keep these processes going where possible and reinforce cooperation with the EU's other partners.

Questions from the audience:

- ***Terkel Petersen*** *from the European External Action Service (EEAS) asked whether, before AWI had to close their research station on the Lena River in Siberia, they had gained enough data to have a firm grasp of how permafrost melt is affecting local infrastructure (roads, housing, ports) and how this would affect the Russian economy.*

Dr Biebow responded that there have been two EU projects looking at permafrost questions. They can say that there is significant permafrost thaw in Siberia, and this is having a significant effect on the economy, but she's not able to give any exact numbers.

Veli-Pekka Tynkkynen added that from an energy perspective, Russian energy infrastructure is by far mainly based in the Arctic, especially its gas production. Vladimir Putin made the decision to invest in energy extraction infrastructure in the Arctic (where there is lots of permafrost) 20 years ago, and Russia will continue to invest in energy infrastructure in areas with lots of permafrost in the coming decades. We know that about 80% of that energy production infrastructure in permafrost areas has already been impacted by permafrost thaw.

- *Egmont Fellow and IPF Board Member **Marie-Anne Coninsx** asked whether the pause in permafrost data from Russia will eventually create a serious gap in the long run, whether complaints about this pause are exaggerated, and if cooperation on permafrost research in the US and Canada can also be reinforced.*

Nicole Biebow responded that it's not the understanding of permafrost that will be affected by the gap but long-term data of the carbon exchange process. Our models currently don't accurately reflect the climate change we're witnessing in the Arctic. They're still not good enough. Scientists need data from Siberia to improve the models. You need the models to make predictions about the future of the Arctic and of Europe. Therefore, AWI is insisting on finding a way to keep access to long-term data on permafrost in Siberia because this is one of the key locations on Earth to study and better understand permafrost.

Outside of the permafrost issue, Russia is also the birthplace of Arctic Sea ice, particularly in the Lena Delta and the Laptev Sea. There are key processes happening there which have no analogue elsewhere on Earth.

Dr Biebow emphasised that scientists understand that there needs to be a ban on working with Russia under the current geopolitical situation and this is more so the case in Germany than in any other country. But when they no longer have data from the Russian Arctic, this is a severe loss with regard to understanding climate change, as key processes happen in the Russian Arctic. Therefore, the Arctic research community hopes that one day research cooperation will be able to resume.

Peter Sköld agreed that isolating Russia is the current strategy, and its governments who decide, not scientists. But his view is more long-term. There will be a time for reconciliation after the war in Ukraine ends. It might be decades before this is possible, but it's important to start preparing for that process already today.

Veli-Pekka Tynkkynen repeated that the West needs a long-term strategy for Russia looking decades ahead. He stated that he fully understands the importance of the huge gap created by missing data from Russia. But if you look at funding that goes to research, 95% goes to the natural sciences and only 5% goes to the social sciences. We know that the world is warming. What we need are more political decisions to solve the problem, so this could be an opportunity to divert more funding to the social sciences.

- *An academic from Paris noted that his research found that the root causes of a lot of climate change are not being addressed on a political level, so it makes sense to devote more money to social science research. He also noted that as Russia continues to trade with many countries, cutting off cooperation with Russian universities might not be effective.*

Veli-Pekka Tynkkynen responded that while Russia continues to sell oil and gas to many countries, they're selling it with less margin than before the war. The same goes for academic cooperation: if Russian scholars are excluded from cooperating with Western scholars from democratic countries they will no longer be in the forefront in their fields of specialisation.

- *A student from Poland remarked that despite the sanctions imposed on Russia after their 2008 invasion of Georgia and the 2014 annexation of Crimea, they continued to balance their budget by selling gas to Europe. If the West is talking about isolating Russia, which domains should this isolation prioritise?*

Veli-Pekka Tynkkynen emphasised that the isolation should be maximal, including different forms of political and social life. The problem with previous reactions to Russia by the West is that the West increased the carrots to Russia. Germany increased its gas dependency on Russia. In 2014, 33% of Germany's gas came from Russia; in February 2022, 55% of Germany's gas came from Russia. We've already tried engaging with Russia and doing business with Russia with the idea that it will tame Russia, and it didn't work. We need to provide not only carrots but sticks as well.

Questions from the moderator:

- *What role does the US Arctic Research Commission (USARC) have in shaping US domestic and foreign policy with regards to the Arctic?*

In response **Mike Sfraga** gave a brief history of the USARC. About 40 years ago, Alaskan Senator Frank Murkowski (father of current Alaska Senator Lisa Murkowski), introduced the Arctic Research Policy Act (in the US Senate), which created USARC so that the US had an independent federal agency with seven presidentially appointed commissioners that could advance US research priorities in the Arctic and focus on the region's research needs. Every two years USARC releases a goals and objectives report, which goes to the US President. USARC also advises the US President, the US Congress, and all US federal agencies, and sees where it can help them advance their respective missions with regard to the Arctic.

The Interagency Arctic Research Policy Committee (IARPC), currently led by Dr Larry Hinzman, is a family of US federal agencies that meets regularly. They build a five-year evolving research plan for the US based on USARC's goals report. It's an iterative process.

USARC consists of seven individuals selected by the US President from different walks of life. The composition of the commission is very important. Five of the seven currently are Alaskans. Four of the five commissioners appointed by the Biden Administration are women. Three of these four women are Alaska Native women who are leaders in Alaska. Commissioners bring perspectives related to health and well-being, economic development, community - a reflection of community and how it fits into US domestic policy and how that informs US foreign policy.

- *What is the scientific community doing about the data gaps caused by the current geopolitical situation?*

Nicole Biebow responded that it all comes down to cooperation. AWI first started looking at other areas where they could get comparable data when they lost access to Russian data. In the case of permafrost modelling in Siberia, AWI stepped up their cooperation with US and Canadian partners to use similar data, as parts of the continental interior of North America are climatically similar to Siberia. Data exchange with friendly nations was also increased, as well as the exchange of best practices. Cooperation with the remote sensing community (ESA, Copernicus) also increased as remote sensing data can close some of the gaps created by missing Russian data.

At AWI they're still trying to keep scientist to scientist cooperation going with Russian colleagues wherever possible, as they have 30 years of data collection history together. However, AWI doesn't expect they'll be able to work in the Siberian Arctic in the next 20 years, which is why they're looking for ways to understand the most important processes that define climate change via other means and by cooperating with other partners.

- *Is Arctic Exceptionalism dead?*

Leander Nielsen responded that the idea of Arctic Exceptionalism goes back to a speech that former Soviet Premier Mikhail Gorbachev gave in Murmansk in 1987 in which he stated that the Arctic should be a zone of peace. The Inuit Circumpolar Council (ICC) has also been saying for many years that the Arctic should be detached from geopolitical problems.

In a journal paper that Mr Nielsen is writing he examines what made the institutionalised cooperation so effective until the Russian invasion of Ukraine in spite of hard security questions. Cooperation was possible on a people-to-people level in the Arctic on many non-military issues. His paper will be published in the *Journal of Scandinavian Military Studies* sometime in 2023.

The answer going forward in his opinion is to go back to seeing which areas of cooperation are still possible to maintain a certain level of Arctic Exceptionalism. Short-term cooperation with Russia won't be possible, but everyone hopes cooperation with Russia will once again be possible in the long term. Mr Nielsen cited one instance where a Russian scholar had been invited to present at a symposium in Nuuk in March 2023 and while both the scholar and the hosting institution in Greenland wanted to go forward with having the Russian scholar present at the event, sanctions on both the Western and Russian sides made it impossible. In the Arctic Council Working Groups, however, about 80 projects continue without Russian contributions.

- *Can science diplomacy be a way to get some kind of cooperation with Russia back?*

Peter Sköld replied that he hopes so. He mentioned that following Russia's 2014 annexation of Crimea, while diplomats in Western countries were instructed to reject invitations from Russian hosts, scientists in Western countries were encouraged to accept invitations from Russian hosts. So, in 2014 and 2015 scientists continued to go to Russia while many other relations between the West and Russia had been paused. This was important as it prevented a knowledge gap that would otherwise have appeared, and it gave better opportunities for research and improving relations with Russia - but now the situation is very different. With an ongoing war, it's difficult to see how good relations with Russia can be restored. However, Dr Sköld said he remains optimistic that cooperation with Russian scientists will eventually resume, and scientists can be the "test pilots" to build relations of confidence and trust in the future - not only through research cooperation but also through education. There needs to be an exchange of students and early career researchers.

Ana Maria Stan added that international cooperation has always been more pertinent for polar research. The Arctic Science Ministerial is an extraordinary initiative of countries interested in Arctic research to come together and commit to common objectives to tackle climate change, environmental degradation, and biodiversity degradation.

- *How can one build interdependency and peace in EU-Russia relations? Can a non-Arctic state like Belgium have a role in this?*

Veli-Pekka Tynkkynen stated that how we build future relations with Russia will have to do with how we can learn from recent history. In the years after Russia annexed Crimea in 2014, in many different forms of social life, the West continued business as usual with Russia, be it in energy policy or scientific cooperation. Many consider the sanctions the West imposed on Russia in the energy sector from 2014 on as "Mickey Mouse" sanctions. Knowing the Russian discourse and imperial mindset that has been there all along, Professor Tynkkynen thinks this was the wrong policy as it put gasoline to the flames, encouraging the objectives of Putin and his entourage to be a colonial power. The West should have acted differently in 2014. Scientific cooperation doesn't live in a vacuum - it's part of society and the political decisions related to Russia.

Professor Tynkkynen added that it's easy for natural scientists to be within a bubble with other natural scientists, isolated from the political issues. Russia has used these soft ways to influence the West to continue business as usual in spite of what Russia does. If we want to build a lasting peace with Russia in the future, at this point, the West needs to fully isolate Russia. This includes isolation of institutions in Russia at all levels of society to send the message to Russian society that Putin's actions are not ok. If we continue business as usual with certain sectors of society, we're not telling that story. At the same time the West should develop a Russia strategy that extends a hand to the part of Russian society, maybe 10-15%, which is European-minded and which favours democracy to send a signal that the West and Russia can have a common path if Russia chooses differently.

Karen von Loon responded to the question about Belgium's role in the Arctic, stating that Belgium has the know-how and the capacity to make a good contribution to finding solutions to Arctic challenges. Multilateralism and international cooperation are part of Belgium's diplomatic DNA.

Regarding Russia, she mentioned that she had done part of her studies in Ukraine and has worked in two of the institutions that now officially support Russia's invasion of Ukraine. We

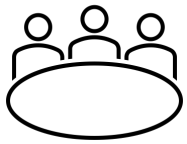
also can't forget that the Russian government has been viciously attacking its own people. Political opposition to Putin has been severely diminished and civil society practically eradicated. Academic freedom leaves a lot to be desired. And climate change does not exist in a bubble; it's the result of political process and decisions, so it's connected to politics. Therefore, we should investigate what we do for those academics who don't support Putin's regime but want to contribute to research on climate change.

PRESENTATION OF LAURENCE TRAN ARCTIC FUTURES AWARD TO… CONTAINING GREENSSWEDEN AB!

International Polar Foundation Managing Director **Nicolas Van Hoecke** and Arctic Economic Council Director **Mads Qvist Frederiksen** presented the 2022 Laurence Trân Arctic futures Award to **Moa Johansson,** CEO of Containing Greens Sweden AB.

Two runner-up organisations were also mentioned: Siu-Tsiu from Greenland and Lofoten Seaweed from Norway.

Ms Johansson thanked the International Polar Foundation and the Trân Family for the award and gave a brief history of Containing Greens (a more detailed account is given later in the last panel of the day). She encouraged attendees to try some of their company's produce during the coffee breaks.



PANEL 2: ARCTIC ENERGY AND RESOURCE SECURITY

- **Moderator:**
    - **Greg Poelzer** (Professor, School of Environment and Sustainability, University of Saskatchewan)
- **Speakers:**
    - **Rasmus Wendt** (Head of Division, Ministry for Agriculture, Self-Sufficiency, Energy and Environment, Greenland)
    - **Kristín Linda Árnadóttir** (Deputy CEO, Landsvirkjun)
    - **Hákun Djurhuus** (CEO, SEV)
    - **Kjell Giæver** (General Manager, Arctic Energy Partners; Chairman, North Norway Energy Cluster)
    - **Martin Phillips** (CEO Europe and Group COO, Talga)
    - **Willfred Nordlund** (Vice-Chair, Arctic Delegation, Norwegian Parliament)

 **Greg Poelzer** introduced himself as an academic by training who has also worked in the private sector for utility companies. He introduced the topic of energy by quoting former US Senator and current US Special Presidential Envoy for Climate John Kerry when he said, "Energy is the solution to climate change."

He then asked his panellists to answer a series of questions.

- *How has the Russian invasion of Ukraine changed the calculus for global energy security and what does this mean for Arctic and sub-Arctic regions, especially as energy producing regions?*

Rasmus Wendt responded that the main security issue in Greenland is climate change, which is endangering Greenland's supply of energy (hydropower from meltwater off the Greenland Ice Sheet). There is an increased interest in developing renewables in Greenland, and Europe was already working on the Green Transition before the war in Ukraine started. Climate policy has very much become a security policy. Greenland is looking for foreign investors to invest in its renewable energy infrastructure.

Kristín Linda Árnadóttir also stated that we were moving towards using more renewables, but the war in Ukraine has sped up the process. As Iceland is a country that uses 85% renewable energy, the population can really see how beneficial it is to have a strong renewable energy infrastructure.

Practically speaking, you need space to put renewable energy infrastructure if you want to develop it. In the Arctic context you have lots of open land and good wind sources, which is why many parts of the Arctic are looking to be the renewable energy producers in the future.

Kjell Giæver mentioned that energy from the Norwegian Arctic is very much in demand at the moment, as without it there would be a total energy crisis. Few people know that 30% of the gas that goes to Europe comes from North Norway, and 20% comes from north of the Arctic Circle. Many European countries taking positions against oil and gas extraction in the Arctic should bear this in mind. New pipelines from Norway to Poland and Denmark opened recently. Europeans have gone from a "position of banning to begging".

If Norway continues to be in this position, from an energy security perspective, the country needs to explore more. If current demand continues, by 2030, Norway won't be able to deliver the gas Europe needs to meet its demands. Europe needs to take into consideration securing Norwegian energy in the short and mid-term as part of its energy policy.

Hákun Djurhuss explained many regions in the Arctic are isolated and still rely heavily on imported oil and gas. Shortness of supply and higher energy prices caused by Russia's invasion of Ukraine can lead to a crisis in these remote communities. This situation has made the argument in favour of the Green Transition even more valid.

The Faroe Islands have high ambitions when it comes to renewable energy: 100% carbon-free electricity production by 2030 and carbon neutrality by 2050. This will be possible by using the archipelago's abundant renewable wind, hydro and tidal energy complimented with solar power and biomass. For this to happen, ambitions must work together with science on cooperation with the political system and authorities.

Martin Philipps explained that Talga is in the business of developing battery materials for the energy storage sector. Russia's invasion of Ukraine has elevated the priority around the security of supply chains. There is already a lot of green energy in northern Sweden to begin with. The Arctic can play a role in delivering the Green Transition, renewable energy, and a solution to weaning ourselves from fossil fuels.

In light of this, the issue of local value chains comes to the fore. Europe has outsourced its energy and raw materials requirements. China is currently the key supplier of Europe's energy storage solutions. This broadens the scope of what Europe needs to prepare for its future, and there's a sense of urgency. The Arctic will play a key role in finding solutions.

As the lone policymaker on the panel, **Willfred Nordlund** stated that politicians will be responsible for making the Green Transition work within a legal framework to provide Europe with energy solutions long into the future.

The war in Ukraine has shown that it was naïve of Europe to rely too heavily on one supplier of energy. Just like taking out fire insurance on your house, you need to take risk management measures to make sure you've covered in case something goes wrong. Unfortunately, Europe hasn't adequately managed its risk over time, which has resulted in very high energy prices and inflation.

Politicians have to answer not only for mistakes made in the past, but they also have to address how they're going to address problems in the future. As the Arctic is one of the regions that will help us find solutions, whether it be gas, renewable energy, or minerals to fuel the Green Transition, putting together a legal framework that respects indigenous peoples' rights and delivers the energy the consumers need will be a challenge to address.

- *As the Arctic continues to deploy more and more renewable energy generation to enhance local energy security, have we learned lessons from the past about the need to maximise the social and economic value of energy systems for Arctic communities and*

regions? Or do we remain trapped in the paradigm of cost per kWh of the physical generation plant?

Rasmus Wendt responded that it's a difficult question to answer from a Greenlandic perspective. Greenland is the poorest country in the Nordic region, so the price of energy matters a lot for households and industry, especially the energy-intensive fishing industry. The government of Greenland must therefore pay close attention to the price of energy. Luckily Greenland can produce renewable energy using hydropower at low cost.

The economic development of Greenland is needed so the country no longer has to rely on financial subsidies from Denmark.

Kristín Linda Árnadóttir reflected on her experience as the Chair of the Arctic Council Expert Group on Black Carbon and methane during Iceland's most recent Arctic Council Chairmanship (2019-2021). She said it is more expensive to put in new energy carriers in isolated communities, whether it be hydro or wind or tidal, but once the system is up and running, this is a long-term financial gain. It's a gain not only in terms of reducing CO2 emissions, but also in terms of reducing black carbon, which reduces the albedo of the Arctic landscape and accelerates warming, and in terms of improving air quality. These systems are also a major gain for small communities that can't get oil and gas to power their communities very often or very easily.

It's important to get different Arctic communities to speak with one another to find the best solutions for their needs, as one size does not fit all. It's also important to identify ideas that don't work. Ms Árnadóttir cited the introduction of cleaner stoves in some Arctic communities to reduce black carbon production. However, this just led to people increasing their energy use, buying more stoves, and using them more. So, there was no real net gain from this initiative.

We can learn from the Arctic and use it in the current situation in Ukraine, which is suffering attacks on its energy infrastructure. Smaller Arctic communities have higher resilience because they're not connected to larger grids. These small communities have learned how to live on their own.

Kjell Giæver pointed out that the Norwegian Arctic produces not only gas but is also one of Europe's largest regions for renewable energy production. Some days North Norway has more energy than they can use, so some hydropower just goes into the sea. Thus, storage capacity is an issue that needs to be solved.

Nonetheless, North Norway has set the goal of being the first region in Europe to achieve the goals of the UNFCCC Paris Agreement - reducing emissions by 55% by 2050. The region is achieving this by using renewables to decarbonise their industry. North Norway has only 9% of Norway's population, but they produce 6 million tons of (carbon) emissions, primarily from industry. These industries are implementing carbon capture and storage, using hydrogen energy solutions, among others.

But this transition will not be easy up front. Years ago, Norway thought the oil and gas sector in the Arctic would create a lot of positive ripple effects, but it didn't create nearly as much as they had hoped. Now with the Green Transition, Norway hopes this transition will value the creation and jobs for North Norway so people will move to the Arctic to live. We will need to all work together for value creation during the energy transition.

Greg Poelzer asked a quick follow-up to **Kjell Giæver** about the community of Berlevåg in East Finnmark, Norway, as an example where you have a lot of challenges. Mr Giæver responded that the municipality has a lot of wind power, a lack of infrastructure for transporting energy, and the local Saami worried about encroachment of the wind industry on grazing land for their reindeer. What the community has done is build a large wind farm in cooperation with the local Saami and created a pilot hydrogen project using this wind farm. The hydrogen is stored and transported as ammonia, becoming part of a value chain that decarbonises communities up in the Svalbard Archipelago. This is a good example of a renewable energy value chain that can be copied anywhere else in the world.

Hákun Djurhuus answered Dr Poelzer's second question by arguing that the political system has a role to play in how we use energy. With the geopolitical crisis in Ukraine, there is an increase in the demand side to find solutions to our energy problems.

We need to be aware that the balance between supply and demand may change to a different balance as the Green Transition unfolds. The political system can help speed up this shift, and they can consider social and economic issues that society would like to address.

Creating a new energy system will have some impacts on local communities, so they need to get some benefits out of the new energy system, whether it be through local partnerships, landowner income, or job creation programmes.

Martin Phillips mentioned that the mining industry has learned a lot about social acceptability and maximising the social value. Direct and transparent engagement with the communities from the start of a new project in regions where a company operates is important. Talga is working with three Saami groups and more than 40 landowners in their area of operations. Their representatives attend all the local community meetings. It's never going to be easy, but coexistence can be achieved through dialogue and mutual understanding.

For example, if Saami need to use an area during the winter months, Talga will only drill in that area during the summer months. Talga is also looking at underground development to minimise the footprint mining creates, how the company stores materials and how it shuts down a mining site with minimal impact at the end of operations.

The social objectives of any mining company should be to make sure that the community where they operate is left with a better standard of living than before mining operations began. Government policies and processes should be clearly mapped to help facilitate this.

Willfred Nordlund answered that as the Chairman of the Standing Delegation on Business and Industry in the Norwegian Parliament, Dr Poelzer's second question is on their table on a regular basis. The Norwegian Parliament is going to have a debate on a new mineral strategy. There will be a new mineral law in 2023 after five years of debate. But this has required dialogue with indigenous peoples and local communities, focusing on maximising the value for the local communities.

What's lacking most in the North are people. Local municipalities would prefer to have more jobs over tax revenue from land because jobs make a municipality more prosperous.

The Arctic needs to be dynamic, like the theme of the symposium. Humans don't like change in general. If we're going to solve issues like climate change and pollution, we're going to have to accept the fact we're going to have to change to deal with these issues. If we don't manage to do it on a local level in business and in policymaking, then there will be a problem in the future. Changes are happening whether you like it or not.

States are putting together frameworks involving funds and programmes to address the Green Transition. If you ask a consumer or a business if they would prefer a higher yet stable price of energy compared to a lower yet unsteady price, most will accept the higher stable price and accept the little surplus on the top as an insurance for the fluctuations in the price because it creates stability and predictability in the market. Stable prices are necessary for the Green Transition to happen.

For example, as energy is lost if it is transmitted over long distances (this is just the laws of physics), it will always be cheapest to make products closest to where energy is produced. This means that you might end up with a factory in your backyard. But we're going to have to accept them if we're going to solve the bigger problems we all face.

- *COP 27 has just concluded and continues to underscore the importance of addressing climate change. A low carbon future, however, almost certainly means a significant increase in mining globally, including mining for rare earth minerals in Arctic regions. Yet, many Arctic communities have deep reservations about the extractive resource sector. What are key policy instruments that could address this conundrum?*

 **Rasmus Wendt** reiterated that Greenland will contribute to the Green Transition where it can by providing cheap electricity through hydropower but also by providing rare earth minerals, which are needed to produce batteries and electronics used in the Green Transition.

Greenland is keen to expand its mining industry. Even though there's a lot of support from the Greenlandic population to do so, there's sometimes resistance to mining at a local level. He echoed **Martin Phillip**'s comments that mining projects need to bring benefits to the local communities where the mining takes place.

 **Kristín Linda Árnadóttir** also agreed that if we want to use renewable energy then we're going to need to use minerals, which means mining. At the same time, we must reuse and work on a circular economy model as much as possible before we ask for more mining rights. If you mine, there are good examples of how to do it where locals and their value system are respected. And the mining companies must talk to all stakeholders, not just a handful. The added value companies leave behind must stay long after the extraction process has finished.

She also brought up the gender gap in the energy and mining sectors, remarking that very few women currently work in these sectors, as evidenced by the composition of the panel.

Kjell Giæver pointed out that 35 million industry jobs are in danger. One answer is a broader value creation related to energy, natural resources, jobs and taking care of the climate. The mining industry has a vital role to play in solving these problems. However, there will always be someone impacted by mining.

One solution is to include the mining industry in the circular economy by producing metals with a low-carbon footprint. That way people see the positive aspects of mining, not just minerals being taken out of the ground. The amount of renewable energy Europe has available gives it great opportunities in this sector.

He then looked at copper in the circular economy as it is one of the most important metals in electronics and very important for the Green Transition. It is currently the most recycled and reused metal in the world - nearly 100% of copper is reused or recycled. At the same time, we need more copper - even double what we have in circulation now - which means we need to mine more of it.

Hákun Djurhuus stated that everything we do must be done in a sustainable way. If we buy wind turbines, solar panels, batteries, etc. we must ask if they're manufactured in a sustainable way, looking at the entire life cycle of the product. Sometimes certain industries take shortcuts to gain advantages, which is why the political system needs to make rules for these activities to encourage more circular use. ESG reporting is one example.

We also must understand that the transition period won't be easy, so cooperation between industry, society, scientists, and authorities is essential.

Martin Phillips commented that ambitious environmental policy is a key part for the mining industry to provide assurance and confirmation that they can work under these guidelines. Environmental law is an important part of increasing the amount of mining taking place and making sure mining is sustainable. It plays a role in the permitting process and in compliance.

He pointed out that there has been a decline in the number of mines in Europe and the processing capacity for raw materials. This is due to the long lead times in getting raw material supply chains started. It's done at a local level, but it's a key factor around future investors coming in.

As for the circular economy, Talga is operating in North Sweden using 100% renewable energy, which is an impressive accomplishment as mining is such an energy intensive process. The company's vehicle fleet is 100% electric and processes the minerals they mine locally within the Arctic region to reduce transport distances. Talga's customers are in Sweden. The minerals they mine aren't being exported; they stay in the region where they're mined. They put recycled materials back into their supply chain. Mr Philipps challenges people to have a different view of the mining industry.

Regarding land issues and conservation, the Critical Raw Materials Act, which should come into effect in 2023, will hopefully provide more clarity not only around development priorities, timelines and permitting, but also in dealing with indigenous groups. There are guidelines from the UN regarding discrimination and prior informed consent of indigenous groups, but these guidelines need to be developed and incorporated into local laws in the Arctic, so all parties are on the same page.

Willfred Nordlund pointed out that a lot of countries have a system in place regarding consultation with local municipalities and indigenous peoples. But in the end, you need to be able to sit at the table with locals and compromise. If not, you won't be able to move forward.

And for implementing a circular economy, this won't be sufficient to make the Green Transition. There won't be enough materials. We'll need rare earth minerals to make the transition. We'll need to make sure we have mineral security in addition to energy security.

If things change, you need to have a backup plan to be resilient. Being able to produce more of our own food, energy, consumer goods and minerals will make Europe more resilient and secure. We need to do it in a smarter and more sustainable way than we've done before.

Kjell Giæver remarked that Europe has access to technology to be in the forefront of seabed mining. Norway has opened areas for seabed mining of rare earth minerals. This doesn't mean that they're currently doing seabed mining, but that they're going to look at how it can be done in a sustainable way.

Questions from the audience:

- *A student from the College of Europe asked about addressing demographic depletion in certain areas of the Arctic and attracting more people to live in the region.*

Rasmus Wendt agreed that it is indeed a challenge to attract not only people to live in Greenland to work in the mines but also to attract those in supporting industries such as health care workers. It's possible to shift those working in the fishing industry to the mining industry, but it's not guaranteed that those working in the fishing industry would want to make that shift. So, Greenland would need to import a mining workforce, which in turn raises the question of whether Greenlandic society wants large-scale immigration into its country. But this is something Greenland needs to face if it wants to develop its mining industry.

Kristín Linda Árnadóttir commented that in Iceland, which doesn't have a large population (347,000 to begin with), if the local population doesn't have the skills for a large, new industry popping up in a particular area, then they need to look at a few key questions: Does the industry import people and how will this affect local society? Is there enough infrastructure in each area to handle that industry? The E-fuels industry (which will provide fuels for the aviation industry) is one such example where a massive workforce would be needed.

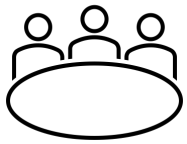
Hákun Djurhuus remarked that their company, SEV, is very visible in their community in the Faroe Islands and it's very motivating for young people to get jobs with them. Many foreigners apply to work for them.

Martin Philipps stated that Arctic communities are focused on businesses that are building in their regions and a workforce that will stay and engage with the local community. They want to avoid a "fly-in-fly out" workforce. Highlighting the cool new technology that the company uses (like being able to operate underground equipment from the surface) or the carbon neutrality and sustainability of the company are ways to engage a younger generation to work for your company. Talga has a diverse workforce consisting of environmental engineers, mining engineers, geologists etc., which results in a very dynamic working environment.

- *A representative from **Siu Tsiu** in Greenland asked **Rasmus Wendt** about unemployment in one third of Greenland's young population and how the government*

plans to create a more stable workforce in Greenland, especially given that Greenland imports a lot of its labour force.

Rasmus Wendt replied that they're having a dialogue with the educational institution that trains people to do construction work and take more people in. One of the main problems with the youth, however, is a lack of basic education. Greenland needs to make sure that more young people complete high school to advance in their careers. It's not possible to bring Greenland into the future without bringing these young people into the workforce properly educated.



PANEL 3: THE ARCTIC AS AN ATTRACTIVE PLACE TO LIVE AND WORK

- **Moderator:**
    - **Patti Bruns (Secretary-General, Arctic Mayors Forum)**
- **Speakers:**
    - **Frida Fossland (Project manager, the North Sweden Green Deal, Västerbotten Region)**
    - **Torbjørn Aag (Project Manager, Kunnskapsparken Helgeland, Nordland County)**
    - **Anja Márjá Nystø Keskitalo (Advisor EU Unit, Saami Council)**
    - **Pita Aatami (President, Makivik Corporation)**
    - **Forest Banks (Project Development Manager, Battelle)**
    - **Krista Perälä (Chair, Executive Board of the Student Union, University of Lapland; Member, Arctic Five Student Team)**

 **Patti Bruns** mentioned that the topic of the panel is of personal importance as she decided to move to the Arctic to live and work in 2014.

As she introduced the panel, she noted that all previous panels in the symposium had referred to the importance of including community and local voices to ensure the resiliency, health and well-being of those who call the Arctic home.

 **Frida Fossland** recounted her own personal story of being born in North Sweden and moving away in her 20s (along with many others in her generation) to explore the world as there weren't many opportunities to work or study at that time. The last few years have changed her opinion of the region as it is a more open and welcoming region bubbling with opportunities for those who want to live and work there. She hasn't regretted moving back as

she has a secure place for her family and is surrounded by beautiful nature (which exhibits all four seasons every year).

She then talked about the project she manages, the North Sweden Green Deal, which is transforming society in Northern Sweden due to the many green industry investments in North Sweden. There are so many investments in the region by global stakeholders (1 billion Euros in the coming years) working in sustainability that North Sweden will need workers. The goal is to increase the region's population by about 100,000 people by 2035. One municipality already has a very low unemployment rate and will need to increase its labour market by 35% in the coming years.

North Sweden faces challenges such as declining and ageing population, not to mention lagging infrastructure. More housing, better public services and more public transport are also needed to support the region's population.

Under the North Sweden Green Deal, which is partially financed by the European Union Regional Development Fund, the counties of Västerbotten and Norrbotten are looking to find solutions for these challenges. The programme focuses on three areas.

The first area focuses on attracting people to live in their region through showcasing the possibilities in the region. The project is also developing national and international platforms to spread the word globally using big data and artificial intelligence.

The second area is solving the labour shortage in the region. It not only focuses on helping industries recruit skilled workers but also works to prevent companies from losing skilled workers. They have a vocational training lab with the green industries in the region to train the workforce of the future. With the University of Norbotten and Luleå Technology University the project is demonstrating better job and life opportunities in the Arctic for university students. Sustainable residential planning is also an important thing to consider, as when companies arrive in the region, they need somewhere for their employees to live.

The third area is policy work, which focuses on cross-border cooperation and existing structures to accomplish common benefits in the project.

Patti Bruns remarked that including local communities and municipalities requires a lot of work and collaboration between stakeholders, including the local community and the EU.

Frida Fossland responded that North Sweden aims to have more than 100,000 people move to their region by 2035.

Torbjørn Aag described the work of the cluster he manages, Kunnskapsparken Helgeland in Mo i Rana, Norway. As a way to combat slow population growth and demographic decline, Kunnskapsparken Helgeland fosters business development and incubation as well as competence development. The goal is to attract more young people with higher education (with a bachelor or master's degree) to work in sustainable jobs in the region, helping them gain valuable professional experience. The trainee program works with several local businesses.

A trainee at Kunnskapsparken Helgeland gets a one-year contract with one of the companies involved in the program. They also get the opportunity to participate in management courses that help them with their transition from student to professional life. The programme also organises social gatherings and leisure activities, allowing trainees the opportunity to experience the natural, cultural, and social opportunities Mo i Rana and Nordland County, Norway has to offer. Candidates have the opportunity to be hired for a permanent position once they complete their training program. During the program they remain connected to a large professional network.

So far, 168 young people (53% men, 47% women) have taken part in the Kunnskapsparken Helgeland program. While 58% of the trainees come from the Nordland County, 42% come from other parts of Norway and even from outside Norway (including the Czech Republic, Russia, and India).

Kunnskapsparken Helgeland is one of many trainee programs in North Norway. The different programs work together and learn from one another to recruit highly qualified employees from all over Norway. This allows them to recruit more candidates than if each company tried to recruit separately.

Global trends show that young people want meaningful jobs, jobs that address climate change and foster sustainable development. The jobs in Nordland County reflect these trends, as participating companies are sustainable-minded and are working in some areas of the Green Transition and the circular economy.

Patti Bruns echoed that worker need to have meaningful lives at work and during their leisure time. Having visited Mo i Rana herself, she was impressed with the pride of the community, its focus on the circular economy, and the pedestrian-friendly town centre.

Anja Márjá Nystø Keskitalo, a young Saami from Kautekeino, Norway who represents the Saami Council in Brussels, echoed **Charlene Vitcheva**'s remarks that it's not only important to live in the Arctic but also to thrive in the Arctic.

The Arctic is full of human resources, and to foster these resources, it is necessary to focus on the people who already live there.

In order to thrive in the Arctic, firstly it is necessary to embrace culture. This is why investment in art and culture, festivals, creative businesses, sports, handicrafts, sustainable tourism, sustainable food production and small niche businesses is so important. There needs to be places where people meet and connect. Culture is what makes vibrant communities.

Secondly, we must also embrace nature. Competing land use in the Arctic and land encroachment has made it difficult for Saami to maintain their livelihoods and culture. Many youths want to work in traditional livelihoods. Saami reindeer husbandry has a great recruitment. Saami youth stay in their communities because of their ties to their traditional livelihoods. However, Saami youth are concerned about their future due to land use pressures. Nature isn't important just for indigenous peoples, but for everyone who lives in the Arctic. Nature keeps us grounded, healthy and sane.

And thirdly, it is important to embrace diversity in terms of people, lifestyles, and jobs. For people to stay in the Arctic they must feel a sense of belonging, that their background and culture have a value, that their voice is heard. It is important to fight racism, discrimination, polarisation, and misinformation. It is important to respect that there are different ways of seeing development and growth and that all peoples have a right to development on their own terms.

Pita Aatami described his region of the Arctic, in the far north of the Canadian Province of Québec in a region called Nunavik, which means "where we have settled" in Inuktitut. The region has 15 communities with a population of more than 13,000 people in a land area larger than the UK.

One of the challenges residents face is living in isolated communities, which means everything needs to be shipped in by plane year-round. Without the plane, the lifeline to the

communities would stop. As there are no major hospitals in Nunavik, any patient with a serious condition must be flown to Montréal.

Attracting skilled workers has been a challenge across Canada. The country is looking for people to work in many different fields. This has affected those in the Far North of Canada even more as people got used to staying home more because of the COVID pandemic.

There is currently a lack of representation in certain professions in Nunavik. There are few doctors and certified accountants who are Inuit. And despite offering attractive salaries, people tend to not want to relocate to isolated communities. There are no road connections out of the region. There's no way out except by plane or if you want to walk 1000 miles through the tundra and boreal forest.

Inuit only started settling in communities 60 years ago. Prior to this, Inuit were very nomadic. Past Canadian governments relocated Inuit, sent the youth to residential schools, and slaughtered their dogs. The trauma that many Inuit have suffered has carried over into younger generations.

In contrast to the rest of Québec, the population in Nunavik is very young (60% are under the age of 25) and growing very fast. To overcome many of the challenges their region faces, they're investing heavily in their youth. They're encouraging students to finish high school and higher education so they can have doctors, nurses, and other highly skilled people in their communities. Pita cited his daughter as an example of success, as she recently became a lawyer working for a law firm.

Connectivity is another issue Nunavik communities face. He mentioned that the challenges in the North American Arctic aren't the same as in the European Arctic. But that better connectivity helps to make life easier. The arrival of Starlink satellite service has made virtual meetings, remote education, and telemedicine possible. However, there is discussion about connecting the region with fibre optic cable. But this won't be cheap.

Pita concluded by describing Makivik as a corporation that represents all Inuit living in Nunavik. Its representatives are elected to three-year terms. The job of the corporation is to work closely with the provincial government of Québec and the federal government of Canada. Makivik also has a board of directors, which includes 22 voting members, one of which is a youth representative. Training the population is part of what Makivik does. It also provides economic development funds for residents who want to start a business.

Forest Banks agreed with the comments of previous speakers that culture and diversity are important, but patience and the culture of a community are also important.

Battelle trains people in local Arctic communities to have the skills to succeed in today's job market. They build work force capabilities and foster small business development in Alaska. However, staff from Battelle who travel from the lower 48 US States to remote communities in Alaska need to have a better understanding of the culture where they're going to be working. Workers from Battelle can sometimes become frustrated when trying to adapt to the culture of each Arctic community. Battle workers need to understand that certain priorities like hunting during certain times of the year and cultural events are important to the local community. Battle staff must go through a cultural training course for each specific region of Alaska where they'll be working. The training focuses on understanding, racism, and disrespect towards Arctic communities.

Battle also focuses on community-specific internships. Mr Banks discussed working with students at the tribal school in Utqiagvik, Alaska in an NSF-funded program which aims to build in the local population science support capacity that also includes traditional knowledge. Science support in Arctic communities can be a career path either full-time or part-time.

Some students want to study science themselves. The communities haven't always been supportive of this because someone can earn a lot of money "driving a rock around in a dump truck" for one of the extractive industries. Some members of these Arctic communities weren't aware of other career paths besides working for the extractive industries.

Battelle takes the money it earns and puts it back in the 36 communities and 12,000 students they serve, focusing on the areas of technology, innovation, research and development, and encouraging STEM education. They invest in primary and secondary schools in remote communities and get money in the hands of small community teachers who otherwise wouldn't have educational resources, as well as to home-schooled students in communities who wouldn't otherwise have access to computers or the Internet. They also teach coding skills to primary school students.

Krista Perälä highlighted the role of student unions focusing on the well-being of students during the COVID pandemic and focused on what well-being for a young person in the Arctic is built on, because well-being is what makes the Arctic an attractive place to live.

Funding is needed to support educational and research institutions, as well as an income for students, at least in Finland, where most students live under the poverty limit. Otherwise, students either need to get themselves into debt or work during their studies. Ensuring a basic income for students - whether in Finland or internationally - will keep them from burning out.

Job opportunities and a smooth transition from student life to the workforce are also needed. This can be facilitated with better communication between universities, municipalities, and businesses. This is how one can know what the youth and in general what the Arctic needs.

A welcoming environment for students and gender equality are also very important, especially for minorities. She asked the audience to reflect on whether the Arctic is a welcoming place to minorities. There is a need to find concrete ways to listen to youth and solutions to minimise hate speech as it can limit youth participation in community discussions.

A focus on sustainability improves the well-being of youth. In her sustainable tourism studies, Ms Perälä focuses on different dimensions of responsibility in sustainability, including social, cultural, economic, ecological, and political responsibility. Enhancing sustainability also enhances safety in the Arctic. And with the war in Ukraine taking place, students often wonder how safe they are in the Nordic Arctic.

Finally, she brought up the issue of balance in one's life, in particular leisure. It's important to have time for leisure activities. Youth shouldn't be put in a pressure cooker so that they're broken before they even graduate. Youth need a good environment to grow and find themselves so they can participate in the changes taking place in the region.

Questions from the audience:

- ***Nafisa Yeasmin****, the lead of the UArctic Thematic Network on Arctic Migration, asked what kind of comprehensive policies can be implemented to prevent outmigration from the Arctic.*

Frida Fossland stated that North Sweden works with its neighbours in Norway and Finland to attract skilled residents together and not cannibalise competencies from other northern regions. The goal is to get people from the south to move north.

Torbjørn Aag agreed that North Norway isn't trying to compete for workers with other parts of Fennoscandia, but rather with larger cities further south. The goal is for people living in more southern parts of the world to see the opportunities in the North. For example, one battery firm, Freyr, is looking for 1500 employees. They aren't able to recruit from the Oslo area alone; they need to look everywhere.

In Norway most businesses use Norwegian as the working language, but Freyr has decided that they will use English internally in the company to reduce the language barrier for foreigners. Local governments need to offer information in English and other foreign languages so that new arrivals will be able to become oriented and settle in more easily.

Krista Perälä remarked that students at the University of Lapland tend to leave during the summer and winter breaks to go south. This tendency increases the closer they get to graduation because there aren't enough jobs available in Lapland to match their degree. Communication between regional organisations and the university can be the start to finding solutions.

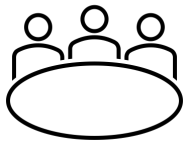
She also added that changes to the university funding models could help. If the funding model doesn't encourage creating international degree opportunities, then it won't attract students from outside Finland. If the funding model forces universities to compete on a national level in Finland, this can make Finland less attractive on an international level.

Frida Fossland agreed that the language barrier is an issue for new arrivals in the North, which is why she believes all businesses need to work in Swedish and English. It's a challenge, but it's also amazing that the current working environment calls for it.

- ***Gustav Sigeman*** *From Nord University and the Horizon 2020 JUSTNORTH project asked how research can help Arctic communities.*

Pita Atami explained that research helps Northern communities a lot because it helps identify and understand the problems and find solutions. The Inuit community was already saying that global warming was happening long before the rest of the world was really taking notice because the Arctic is the "barometer of the world." Global warming has created challenges to adapt to a changing world. Spring comes earlier, summers are longer, and

winters are shorter. Invasive plant and animal species from the south are moving further north. More research is needed in the Arctic.



PANEL 4: ARCTIC INNOVATION

- **Moderator:**
    - **Mads Qvist Frederiksen** (Director, Arctic Economic Council)
- **Speakers:**
    - **Moa Johansson** (CEO, Containing Greens Sweden AB)
    - **Séverin Schnepp** (Head of Brussels Office, European Affairs Manager (EU & NATO), Terma A/S)
    - **Tórheðin J. Jensen** (Chief Marketing Officer, Varðin P/F; Chair of the Faroese Council for Research, Development, and Innovation)
    - **Line Kjelsrup** (Cluster Manager, Biotech North)
    - **Egill Þór Níelsson** (Senior Adviser at the Icelandic Centre for Research)

 **Mads Frederiksen** began his session by showing a polar projection map of the trading routes in the Arctic in 700 AD to demonstrate that trade has been going on in the Arctic for centuries. He then showed inventions the Inuit devised centuries ago, including the world's first lightweight waterproof rain jacket made from animal skin, the world's first snow glasses to prevent snow blindness made from animal bone, the world's first dry suit made for animal skin, and two-thumbed gloves used in whale hunting made from animal skin.

He then introduced the "Arctic innovation equation":

natural advantages + technology x (ideas x execution) = value and competitiveness

Mr Frederiksen explained that the Arctic has some natural advantages, but that when we add in technology, it gains value and becomes a competitive region. The definition of innovation as learned in any business school is ***ideas x innovation***. An idea is just an idea unless you

execute your idea. Innovation is also the ability to see changes and an opportunity, not a threat.

He then explained there are different kinds of innovation: architectural innovation, radical innovation, incremental innovation, disruptive innovation. The kind depends on the impact on the market and the technology used. He gave four examples of the different kinds of innovation from existing companies in Arctic countries.

The town of Berlevåg in North Norway decided to harness something it has a lot of - wind - to its advantage. They built wind turbines to improve the energy security and quality of life for the town's residents. Then they had too much energy and decided to build more wind turbines as the town realised hydrogen technology is the future. They're currently building a hydrogen plant thanks in part to EU Horizon 2020 funding.

Mads then explained that he had asked his panellists to do a SWOT (strengths, weaknesses, opportunities, threats) analysis of Arctic innovation and handed the floor to them.

 **Moa Johansson** explained the history of the company of which she is CEO, Containing Greens. Located in Luleå, the company focuses on cultivating vegetables locally in North Sweden using heat from data centres with the goal of reducing the dependency of transporting vegetables to the region from far away.

The company started as a summer job with the objective of solving a problem in Norrbotten County in North Sweden: the region was not self-sufficient when it came to food production. Only 6% of food consumed in Norrbotten is produced there, meaning 94% is imported and resilience is low in terms of food production capacity. As growing outside is difficult in the Arctic, the team at Containing Greens looked for solutions indoors.

Greenhouses need to be heated during winter, which makes them economically unsustainable. But data centres are used year-round and produce a lot of wasted heat as a by-product of their operations. So, in 2020, Containing Greens captured the heat from data centres in the region and fed it into hydroponic greenhouses (where plants are grown vertically using only water, nutrients and LED grow lights). Then local restaurants started buying from Containing Greens, and their business became a reality. Their goal is to scale their business to a larger facility in Luleå and then to the rest of North Sweden and hopefully other parts of the Arctic.

Containing Greens focuses on sustainability and benefits to the local community. They use reused and recycled materials to build their own grow lights and hydroponic systems. They grow plants at night using LED grow lights when energy use is lower. The company is also working with the local municipality to educate locals to work in the greenhouses, so the region doesn't need to import workers.

 The next speaker, **Séverin Schnepp**, spoke on behalf of the Danish company, Terma Group, which focuses on defence technologies such as aeronautics, radar, space, and artificial intelligence. He opened his presentation by mentioning the company's podcast, *Allies in Innovation.*

The challenge in the Arctic is situational awareness. To have it, you need to do three things:

1. Develop the sensors (radar, drones, satellites) to collect data from multiple sources
2. Have the network and bandwidth to transfer the data in real-time or near real-time
3. Have the capabilities to process the data through an algorithm using data fusion technologies

The challenges of operating in the Arctic include its vastness, harsh weather, and lack of infrastructure (especially IT and communication). Therefore, one needs to develop sensors that can endure the harsh climate yet at the same time be as self-sufficient as possible. It's also not realistic to expect perfect situational awareness in the Arctic as it's too big. One must therefore choose which areas to cover and with what kind of sensor (radar, satellite, drone) to maximise coverage.

Data-driven technologies are based on machine learning. They are "trained" to fit the needs of the user (i.e. an alert system that distinguishes between a drone and a bird). Standardisation of data (data fusion) is also key to making the entire system work. Strategic competition forces companies in their sector to always work on developing new and better detection technologies. This shortens the innovation cycle.

Terma is one of the few companies in Europe able to integrate land, air, sea, and space data to create "systems of systems". They don't make a product themselves but are able to make a data product out of other products. Some products include light ground surveillance for NATO, predictive analytics for maritime security, leading the AI for EU defence projects, and a project called BIFROST, which uses AI to monitor the Arctic.

Terma also has strong partnerships with its end users. As problems change over time, it is necessary to adapt one's AI products very often, so feedback from end users is key.

The situational awareness products Terma produces are dual use technologies, meaning they have more uses than for just the military. They can check the safest shipping routes, assist with search and rescue operations, conduct Earth observation and monitor the effects of climate change. With increased interest in the Arctic, Terma is seeing new kinds of cooperation potential with the European Defence Fund Program and with the new EU Office in Nuuk.

Tórheðin J. Jensen highlighted that the Faroe Islands is a small country of 55,000 people with bad weather, no mineral or oil wealth, yet it has a higher per capita GDP than Denmark. This is due to innovation and its seafood resources.

One might think that little innovation happens in the fishing industry. But in 1985, 11,000 people in the Faroe Islands were employed in the fishing industry, and in 2016 only 5,500 were employed, yet the production has been much larger. This is due to innovation.

In terms of CO2 footprint, there is no protein as efficient as pelagic fish; it's one tenth the CO2 emissions associated with chicken. If you want to have a clean conscience, eat herring or mackerel.

At Varðin, fish is caught and frozen to -1.5°C, after which it's processed in a factory on the southernmost island of the Faroe Islands, packed either whole or in fillets, and then sold worldwide.

Tórheðin compared high sea fishing to salmon farming. The first practice is centuries old and has a long tradition associated with it, while the latter is only about 40 years old and is built on research. Each sector provides its own kind of innovation. In fishing innovation is incremental while in salmon farming it tends to be more radical. Fishing companies rarely have a research and development department, yet research and development are at the heart of the salmon farming industry. In the fishing industry, knowledge is tacit (fishermen know their craft), while in salmon farming there's strategic knowledge integration (new knowledge is integrated into the industry all the time).

Innovation in a cluster of several companies is important. In the Faroes Islands, 80% of fishing and salmon farming companies are based within 30 minutes of one another, meaning knowledge and products are close to one another.

He then explained three examples of innovation in the Faroe Islands:

- A salmon framing company called Hidden Fjord started producing big smolt before others. Now many salmon farmers are producing big smolt.
- A pelagic fish processing plant on Suðuroy Island, which uses more energy than all 4,500 inhabitants living on that island uses a mix of water, oil, wind, and sun for energy. Thanks to a battery system, 85% of the energy produced is green energy.
- The mesh in the belly of a trawl net was modified based simply on observations from captains of fishing vessels. This is an example of tacit innovation - implementing knowledge that's already there.

 **Line Kjelsrup** focused her presentation on explaining the importance of clusters working together to create innovative products.

One such product is PreCardix, developed by a company called Marealis, one of the members of the Biotech North fisheries cluster. PreCardix is the world's first natural product made from prawn shells that reduces high blood pressure.

Stella Polaris, an established and innovative company providing cooked and peeled prawns that also has a zero-waste philosophy, provided the prawns and the investment capital while researchers at Nofima noticed that peptides in the prawn shells could influence blood pressure. After the peptides are removed from the prawn shells, they are turned into a powder and used as a flavour enhancer or feed in aquaculture.

PreCardix is the result of the cooperation between three companies who make use of the entire prawn. It's a great example of both sustainable use of ocean products and ways innovative clusters can contribute to the circular economy.

Other such examples include:

- Arctic Science Technologies, which produces cold adapted enzymes from marine organisms. Many COVID tests have marine enzymes from cod liver in them.

- Noorskin produces salmon leather for the fashion industry. But when they remove the scales from the fish skin, this can be used to produce bioplast.
- The Marbio research group at the University of Tromsø have found answers to some of the most aggressive forms of breast cancer and antibiotic resistance. Again, these solutions were found through bioprospecting the organisms that live in the Arctic Ocean.
- A collaboration between Finnfjord ferro silicon producer and the University of Tromsø, which involves growing marine microalgae in large tanks. The algae eat the CO2 from industrial smoke Finnfjord and produce important ingredients for fish feed.

The Arctic has a lot of good raw materials from which we can develop high-value products. Research has shown there are countless applications for these products: medicine, food supplements, cosmetics, fish feed, etc. Marine biotechnology is an important tool creating a greener industry and taking care of other industries' side streams. All the products were made possible thanks to governmental support, the right infrastructure, and the research.

Egill Þór Níelsson, the last speaker of this session, focused his contribution on the pillars of Iceland's economy and connectivity.

The pillars are:

- The seafood industry, relying mainly on cod
- Renewable energy, relying mainly on aluminium smelters and silicone plants
- The tourism industry, which significantly increased in the pre-covid period
- The knowledge industry, focusing on research and innovation. This is why 2,53% of Iceland's GDP goes into research and development projects.

Mr Níelsson highlighted that such important economic development in Iceland was made possible due to important infrastructures that were built up in the past years, which have fostered and increased connectivity with the rest of the world

Mads Frederiksen then concluded the SWOT analysis by asking the panellists to discuss threats and weaknesses with regard to Arctic innovation.

- ***Threats:***

Line Kjelsrup mentioned that since innovation moves faster than regulation, and since it takes time to change regulations, sometimes it might delay the implementation of innovation. Therefore, she considers that to support research-driven innovations, we also need to work with regulations in business models. If not, there is a risk that the product might fall out of the market.

Moa Johansson also reflected on the difficulties Containing Greens AB has faced due to a lack of clear regulations covering their activities.

Tórheðin J. Jensen focused on the negative consequences arising from import restrictions to the EU, especially in the way that it limits innovation.

Egill Þór Níelsson highlighted the way in which bilateral agreements and protectionism differ between countries within the Arctic and the consequences of Russia's unlawful invasion of Ukraine on expert markets.

Séverin Schnepp, considering strategic competition as more of a challenge than a threat, focused instead on strategy competition and how important product robustness is for this purpose.

- ***Weaknesses:***

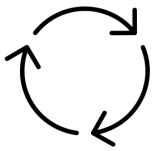
Moa Johansson considered one of the main weaknesses for smaller companies is access to capital. While there are a lot of opportunities for investment, it is harder to access them as a smaller company.

Tórheðin J. Jensen repeated that one of the main issues is the lack of people with a higher education in the Arctic.

Line Kjelsrup considers that while the Arctic invests a lot of money in research and achieves exciting results, it doesn't invest enough in taking these results to the next level.

Séverin Schnepp focused instead on the lack of infrastructure, not only on land but also in space.

Egill Þór Níelsson underlined the difficulties of putting research projects to practical use through innovation. While this is a process that takes time, he hopes that it will develop further into the future.



CLOSING REMARKS

- **Mike Sfraga** (Chair, U. S. Arctic Research Commission)

Dr Sfraga concluded the last day of the symposium be reflecting on six words with regard to the Arctic:

- **Mirror**: The panels, programs, and discussions at the Arctic Futures Symposium can be represented by a mirror, reflecting on things that we all work on, that we care about during the day, and that we worry about at night.

- **Kaleidoscope**: This word represents the different ways in which issues have been addressed during the symposium, depending on different points of view.

- **Prism**: This word represents the different ways in which the symposium has approached an issue, a challenge, an opportunity, or a threat.

- **Forecast**: This word represents the symposium's efforts in looking into the future, especially from a security perspective.

- **Urgency**: This represents a sense of urgency to address, be involved, be engaged, and affect change in the Arctic.

- **Action:** This word represents the need to take action to make a change in the Arctic, whether through research, politics, or investments.