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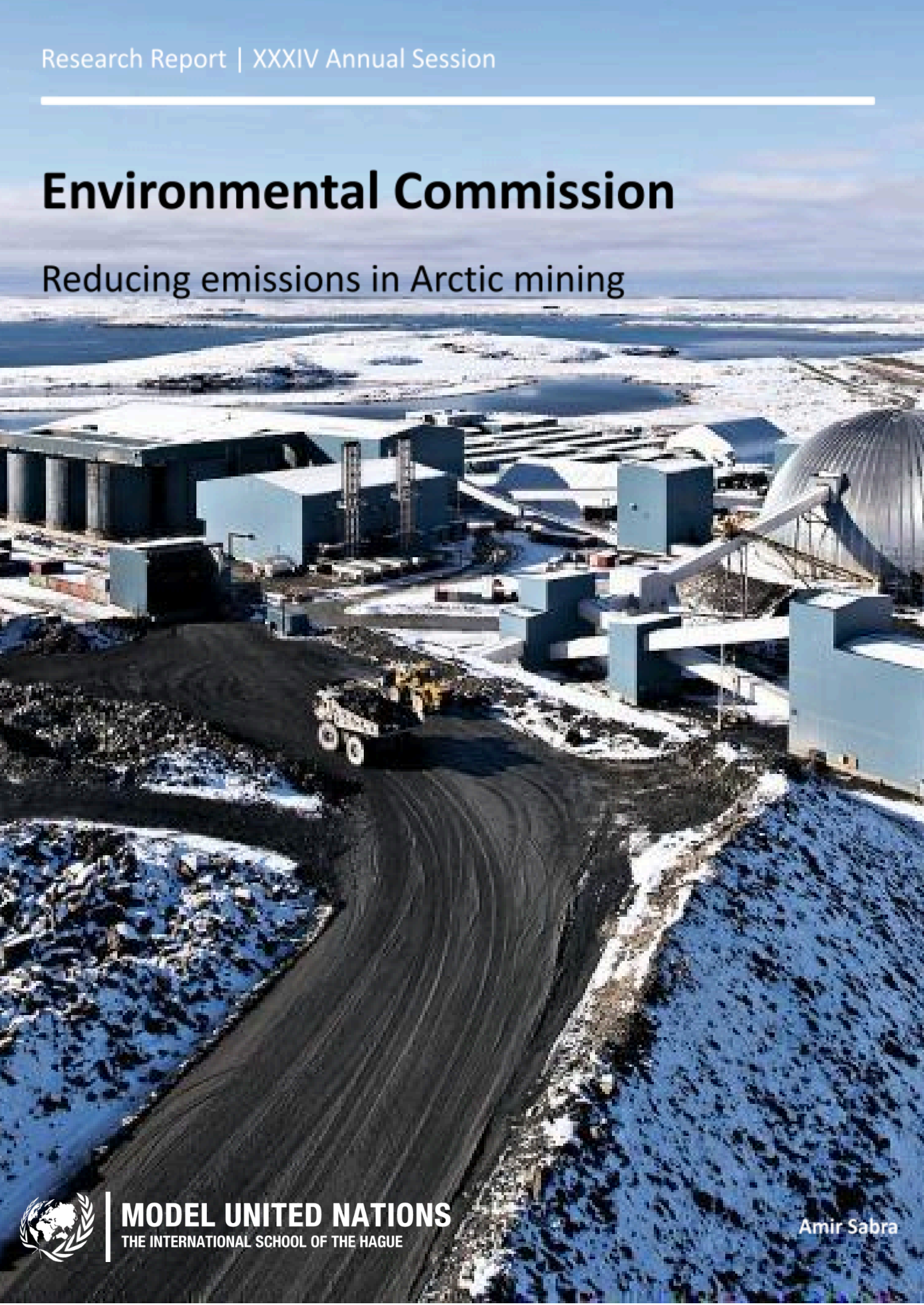
Environmental Commission

Reducing emissions in Arctic mining



MODEL UNITED NATIONS
THE INTERNATIONAL SCHOOL OF THE HAGUE

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Forum	Environmental Commission
Issue:	Reducing emissions in Arctic mining
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Introduction

For several centuries, the pure and remote Arctic was ignored by both science and international politics. The Arctic did not receive much attention until after World War II, when various states became invested, in turn growing an interest in the unexplored region, mainly due to technological advancements and an increasing demand for resources and space. soon after this interest quickly turned into a military playground. until the emergence Soviet Union's perestroika, which helped pave the way for the first meeting of eight major Arctic nations—Canada, Norway, Denmark, Finland, Iceland, Sweden, Russia, and the United States—exclusively with an emphasis on the Arctic, which took place in September 1989 in Rovaniemi, Finland.

For several centuries, the pure and remote Arctic was ignored by both science and international politics. The Arctic did not receive much attention until after World War II, when various states became invested, in turn growing an interest in the unexplored region, mainly due to technological advancements and an increasing demand for resources and space. Soon after this interest quickly turned into a military playground. until the emergence Soviet Union's perestroika, which helped pave the way for the first meeting of eight major Arctic nations—Canada, Norway, Denmark, Finland, Iceland, Sweden, Russia, and the United States—exclusively with an emphasis on the Arctic, which took place in September 1989 in Rovaniemi, Finland.

Since the conclusion of the meeting, the Arctic region has undergone rapid change, these changes will pose immense ecological challenges for the Arctic states, and they will also face challenges related to natural resource extraction, maritime infrastructure and transportation, territorial disputes, and changes to the political landscape. Addressing these challenges will require significant adaptation efforts, and urgent action to reduce greenhouse gas emissions is needed to limit further warming and changes to the Arctic environment.

For example, Rapid climate change is causing the Greenland Ice Sheet to gradually melt, the ocean to become more acidic, the permafrost to thaw, an increase in the frequency of forest fires, and record high temperatures in the Arctic, with the help of Methane and black carbon emissions which are thought to be major contributors to this melting process. Carbon emissions are sourced from several sources: wood and coal burning in homes for heating and cooking, wildfires and open burning of agricultural wastes, diesel engines' emissions, and flaring during extraction of oil and gas. At a site in Antarctica, this level of CO2 surged to nearly 400 parts per million higher than it has been in the past 400,000 years. Additionally, the average tourist visit to Antarctica results in about 5.44 tons of CO2 per passenger, with an estimated 70% being attributed to cruise ships. This black carbon from research and tourism has also contributed to increased snowmelt estimates to as high as 23 mm of reduced snowpack in affected areas each summer. In the 2003/04 season, there were 23,000 tourists to Antarctica. This figure has now more than tripled to 74,401 during the 2019/20 season, a situation that further complicates the already strained environmental setting of the region.

Definition of Key Terms

Arctic Mining

The process of extracting useful materials from the Arctic, including phosphate, bauxite, iron ore, copper, nickel, and diamond.

Black Carbon

The sooty black material emitted from gas and diesel engines, coal-fired power plants, and other sources that burn fossil fuel. However, scientifically black carbon (BC) is a particulate matter component that is chemically made up of multiple linked forms of pure carbon. It is created when fossil fuels, biofuels, and biomass are not completely burned. It is one of the primary kinds of particles

Heavy Metals

Metallic elements that have a relatively high density compared to water. With the assumption that heaviness and toxicity are inter-related, heavy metals also include metalloids (whose properties are intermediate between those of metals and solid non-metals or semiconductors), such as arsenic, that are able to induce toxicity at low level of exposure

Indigenous Communities

Local communities that have traditionally lived in the Arctic region and have a strong connection to the land and environment.

Climate Change

Climate change refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, but since the 1800s, human activities have been the main driver of climate change, primarily due to the burning of fossil fuels (like coal, oil and gas), which produces heat-trapping gases.

Greenhouse Gas Emissions

Greenhouse gases (also known as GHGs) are gases in the earth's atmosphere that trap heat. During the day, the sun shines through the atmosphere, warming the earth's surface. The greenhouse effect is made stronger by greenhouse gas emissions caused by human activity. This has an impact on the environment. One of the main contributors to climate change is the emission of carbon dioxide, which is released into the atmosphere when fossil fuels like coal, oil, and natural gas are burned.

Sustainable Development

Development that meets the needs of the present, without compromising the ability of future generations to meet their own needs

General Overview

Background

Mining has a longer history than hydrocarbon extraction in the Arctic. Interest in the Svalbard archipelago in the late 19th and early 20th centuries, culminating in the Svalbard Treaty in 1920, was generated by the high quality of Arctic coal deposits, then the principal fuel for shipping. For a long time, mining was Greenland's only economic export activity besides fishing.

More recently, investment from mining companies in the Arctic has increased, with some projects proving controversial due to the risks for air and water pollution. However, mining projects do have better long-term development potential than oil and gas, due to a larger permanent and local workforce and a project lifetime of several decades. There are already 25 mines in operation in the Russian Arctic, belonging to companies such as Norilsk Nickel, the world's biggest nickel producer. In 2010, exports of zinc, lead, gold and copper accounted for 36.8% of Alaska's foreign export earnings, worth $1.3 billion.

Countries like Greenland already host a range of mines, including the Seqi Olivine mine, run by Swedish company LKAB. Mining represents half of the Northwest Territories' income in Canada, with diamond mining north of Yellowknife growing exponentially. The Mary River iron ore project on Baffin Island in Nunavut is due to get under development in 2013 and will need an estimated $4.1 bln of direct investment up to 2040. The mining prospects in Northern Scandinavia spread across northern Sweden and Finland, Kirkenes Norway iron mines, and Kiruna, Sweden nearly the largest underground iron ore mine in the world and the largest Arctic mine overall.

Environmental impact

Mining has a significant negative impact on the environment, which can lead to air, water, and soil pollution, as well as obvious landscapes changing. The area affected is usually very extensive, reaching beyond the site of extraction and the time period during which extraction occurs; however,

effects vary due to factors such as local conditions, the type of resource being mined, and technology applied.

numerous sources of various activities in the Arctic are believed to be contributing to air pollution. Sources of combustion, emissions from on-road and non-road mobile sources, residential space heating from wood, oil, coal, and natural gas, electricity generation from coal, diesel, natural gas; mineral, metal and oil, and gas extraction industries linked with the Arctic. Other sources include shipping along the coastline and inland rivers. Besides, the combustion of biomass and wastes leads to the emission of aerosols and reactive gases. While humans may initiate them, fires in the boreal forest are a large natural source of pollutants.

The mining camps primarily affect human beings through health issues resulting from poor air quality, water pollution, and environmental contamination. Massive deforestation of lands for the acquisition of mineral wealth occurs in the areas of forests and jungles which lie. It leads to the loss of biodiversity as well as the biotic community in that particular area. Other areas that are much exposed are: the coastal and marine, indigenous areas, local communities, Arctic and Antarctic regions and watersheds.

Emissions monitoring becomes critical in gaining a better understanding of the impact, origin, and levels of mining emissions for lessening their impact on air quality. Some solutions include dust suppression systems, particle irrigation-reducing techniques, filtration technologies, and electrostatic precipitators. More stringent environmental regulations and their enforcement are required in limiting the emissions from resource extractions, coupled with the development of new extraction systems and continually improving them.

Importance of Arctic mining for resource extraction and economic development

Mining overall. Indigenous peoples have been involved in the mining industry for centuries in the Arctic region. Historically, this area has been exploited for its resources, which are essential for the development of a more advanced and modern global civilization, as well as for efforts to ensure a greener future.

The World Bank estimates that, because of the change in worldwide energy policy, there will have been an increase of approximately 500% in demand for raw materials by 2050. The Arctic Circle encompasses about 6% of the Earth's surface, comprising around 40% land split between several countries. Moreover, above 33% is made up of continental shelves beneath 500 metres of water. This region holds vast deposits of strategic resources, particularly rare earth metals: dysprosium, terbium, praseodymium, and neodymium. These metals play a vital role in technologies like wind turbines and batteries, putting these minerals on the frontline of the world's shift to green energy and electrical vehicles. Moreover, it is also believed that immense reserves of other minerals like lead, iron, nickel, zinc, gold, silver, coal, mica, and vast resources of construction materials like sand, gravel, and crushed rock lie in the Arctic region.

The President of the European Commission stated:

> "The economies of the future will no longer rely on oil and coal, but on lithium for batteries; on silicon metal for chips; on rare earth permanent magnets for electric vehicles and wind turbines. And it is sure: the green and digital transitions will massively increase our need for these materials."

Emphasizing that with economies pivoting to renewable energy and digital technologies, the demand for minerals such as lithium, silicon, and rare earth elements increases. This makes the Arctic area, with regards to Greenland, a strategic zone for mining operations since it is richly endowed with these resources. That our sustainable future starts underground, in a mine, presents the view that there will be no way to avoid the mining factor as an important issue bound to security and the health of the planet.

Efforts to Reduce Emissions in Arctic Mining

Mining fishing. Several Different countries have adopted various policies to reduce the effects of SLCPs. For instance, in support of the President's Climate Action Plan's goals, which are part of the Strategy to Reduce Methane Emissions, the EPA is currently undertaking several measures to curb methane emissions from coal mines, agriculture, and the oil and gas sector in the United States. Reductions in black carbon and methane emissions from oil and gas operations have been initiated in the Arctic. This will help in mitigating Arctic climate change. Targeted reductions in these two emissions may decrease the projected warming in the Arctic by up to 25% by 2050.

Modern mining is increasingly being based on principles of environmental protection and sustainability. Workshops and cooperation between countries in the Arctic area allow defining a set of best practices aiming at diminishing the impact of mining activities on the environment, underlining that mineral extraction should be placed in relation to protecting the ecosystem. The Arctic is considered a crucial, strategic area for mining operations as the global energy transition increases demand for minerals. More importantly, however, it shows how key responsible mining—both in security and planetary health terms—would be to ensure that extraction doesn't come at the price of this fragile Arctic environment.

In collaboration with the Russian Ministry of Natural Resources and the Environment, hosted a webinar on black carbon and methane emissions from the oil and gas sector in October 2020. In this two-day ACAP webinar, 85 experts took part in the online event representing the Arctic Council's Observers, the Arctic Monitoring and Assessment Programme, the Expert Group on Black Carbon and Methane, the relevant businesses operating in the Arctic, international partnerships, and the scientific community. The shared objective of the webinar was to enlighten the audience, along with sharing perspectives on ways to improve efforts when dealing with the problems associated with black carbon and methane emissions, which represent a very large share of energy-related emissions. Participants worked out the effective cost solutions related to the application of the best available technologies, best environmental practice in dry gas compression, and re-injection of associated petroleum gas and light hydrocarbon monetization at fields with specific qualities.

This would bring about a reduction in SLCP emissions from the current 25 million tons of CO2e to 7 million tons by the year 2025 in the Russian Arctic region.

The Arctic Monitoring and Assessment Programme's paper "Enhancing the reduction of black carbon emissions to protect the Arctic" outlines several actions to reduce emissions, including:

- Establishment and improvements of monitoring and inventories to strengthen the knowledge base
- Non-binding policy statements to guide actors on future goals
- Legislative proposals that put demands on actors to make technical improvements reducing emissions
- Economic incentives for forerunners

- Information and guidance to change practices
- Funding of research and innovation

These collaborative efforts and proposed measures demonstrate the Arctic Council's commitment to addressing black carbon and methane emissions from the mining sector to protect the fragile Arctic environment.

Such strategic objectives provide a basis upon which AMAP can ensure that knowledge and appropriate tools are available to meet the many complex environmental challenges facing the Arctic region this century

Major Parties Involved

Arctic Monitoring and Assessment Program (AMAP):

AMAP is an organization under the auspices of the Arctic Council that is in responsibility for keeping an eye on pollutants and issues related to climate change in the Arctic region as well as evaluating its current state.

AMAP has 5 strategic goals:

Strategic Goal 1: Improved knowledge and understanding of Arctic change through collaborative assessment processes, for use in evidence-based decision-making

Strategic Goal 2: A strong, sustained and coordinated circumpolar monitoring and observation network

Strategic Goal 3: Enhanced understanding of Arctic change and its impacts through inclusive partnership with Indigenous Peoples and residents

Strategic Goal 4: Effective communication on Arctic challenges and global implications

Strategic Goal 5: Support relevant international processes

AMAP aims to promote and enable collaboration and synchronization among pertinent entities concerning intersectoral matters.

The Arctic Council:

Established in 1996, with regard to shared Arctic issues, particularly those pertaining to sustainable development and environmental protection in the region, the Arctic Council is the principal intergovernmental forum that promotes collaboration, coordination, and interaction between the Arctic States, Arctic Indigenous Peoples, and other Arctic residents.

Canada:

Being a Major party of the arctic council Building ties with Indigenous peoples, addressing socioeconomic and cultural development, and combating climate change are Canada's top priorities when it comes to the Arctic. In particular, Canada's priorities during its first chairmanship of the Arctic Council were:

- Youth development in the Arctic, including social, environmental and economic issues affecting children
- Developing closer partnerships with Indigenous peoples and Arctic States to address common challenges and opportunities
- Cooperation between Indigenous Peoples and Arctic States

Energy Companies:

Large oil and gas companies are another major category of Arctic resource buyers. Companies belonging to this category desire to exploit the vast reserves of oil and natural gas lying within the region. Notable companies include Gazprom, Rosneft, Shell and ExxonMobil, although there are more.

Timeline of Key Events

You can include a small paragraph to explain the timeline. Otherwise you should follow the format specified below:

Date	Description of event
1899	Coal mining begins on Spitsbergen Island in the Arctic.
1970s	Large-scale oil and gas production starts in Siberia, leading to increased industrial activity in the Arctic.
1970s-1980s	Mining activities increase in Northern Fennoscandia (Finland, Norway, Sweden) and Greenland.
1990s	Environmental concerns about the impacts of mining operations in the Arctic region start to grow.
February 18th, 2005	KYOTO PROTOCOL GOES INTO EFFECT
September 15, 2008	The global economic crisis slows down mining activity in Greenland.

July 23rd, 2008	The U.S. Geological Survey issues an appraisal of untapped petroleum resources available north of the Arctic Circle.
OCTOBER 24, 2013	GREENLAND VOTES TO END MINING BAN
2013-2014	The European Commission-funded "Strategic Assessment of Development of the Arctic" project is implemented, highlighting the notable upsurge in mining activity across the European Arctic.
12 December, 2015	Paris agreement
NOVEMBER 18, 2016	OBAMA ADMINISTRATION SHUTS DOWN ARCTIC OFFSHORE DRILLING UNTIL 2022
2019	The Arctic Council's Protection of the Arctic Marine Environment (PAME) Working Group convenes a workshop on "Arctic Mining: Environmental issues, mitigation and pollution control for marine and coastal mining".
2023	The PAME workshop proceedings are published, providing a comprehensive overview of the key environmental issues, challenges, and potential solutions related to Arctic mining.

2024	Ongoing efforts continue to promote responsible and sustainable mining practices in the Arctic, balancing economic, social, and environmental considerations, as the region sees continued interest and development in resource extraction activities.

UN involvement, Relevant Resolutions, Treaties and Events

- Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, 24 December 2017, (A/RES/72/249)
- European Parliament resolution on Norway's recent decision to advance seabed mining in the Arctic January 31st 2024 (B9-0095/2024)

Previous Attempts to solve the Issue

There have been numerous attempts regarding the reduction of mining gas production at both past and present times. Some of the major ones include the work by the Arctic Council, more precisely, the Protection of the Arctic Marine Environment; this is a project on environmental issues and mitigation for marine and coastal mining. PAME had thus organized a workshop with the objective, as stated in their paper: " To identify and better understand key lessons on mitigating impacts of mining on marine environments and to share lessons from an environmental and technical perspective. In addition, we sought to improve the knowledge base about the potential impacts of mining to support informed decisions and to identify how the impacts can be minimized."

There was a lot of interest in the workshop; it was attended by both academia representatives, business, governments, regulatory agencies, and local and Indigenous organizations and communities of over 11 different countries. The AC has also put in place some other programs, among them the Arctic Contaminants Action Program, abbreviated to ACAP, which aims at facilitating the exchange of information between states and promoting a series of national actions that will reduce pollution in the Arctic environment. Since its establishment in 1991, ACAP has developed and published various reports and communication products that detail the present status of the Arctic

region with regard to pollution and climate change, providing science-based advice relevant to policy for the Arctic Council and governments.

In addition, since the Ministerial meeting in 2017, the Arctic Council has conducted workshops focused on two types of emissions—black carbon and methane. During this meeting of ministers, the Council approved a joint objective of reducing these emissions. The Council publishes public reports on the implementation by the Arctic member countries of the national results achieved every two years.

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Possible Solutions

Research in the area needs to be given priority because it's critical to comprehend the effects of taking materials from Antarctica. This can be achieved by lowering barriers to research in the field through legislation in the Antarctic Treaty or by providing subsidies to private research corporations. However, research must be strictly controlled to prevent harm to Antarctica's habitats. For instance, certain surveying techniques may endanger marine life. Furthermore, research ought to focus on determining whether the extraction of these resources will harm Antarctica and whether there are technologies that can prevent this damage, rather than on the quantity and profitability of resources.

Besides further research numerous technology systems could be put into place. Advanced technology such as but not limited to irrigation and Filtration Technologies could reduce the extent to which particles of harmful waste gets dispersed, limiting the effect it could have on the surrounding environment. Furthering developing new and improved means of extraction such as Leaching Extraction Methods which utilizes leaching processes such as such as atmospheric chloride leaching, solvent extraction, and electrowinning, are emerging as more environmentally sustainable extraction techniques compared to traditional methods overall reducing harmful air emissions

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