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Yamal 2040: Scenarios for the Russian Arctic

Introduction

People living or working in the Arctic are faced with uncertainty regarding future social, political, economic, and environmental change. This uncertainty is due not least to the ongoing transformations caused by climate change. Blue-Action developed a case-study "Yamal 2040: Scenarios for the Russian Arctic", which employed 'Strategic Foresight', a specific co-design and engagement methodology, to support stakeholders of one particular region in the Arctic, the Yamal region in Western Siberia, Russia.

Yamal is one of the biggest regions in Russia, its population is about 534.000 people, of whom 8% are Indigenous. Indigenous groups include titular Nenets, Khanty, and Selkup, who still practice nomadic reindeer herding, hunting, fishing, and gathering. While these subsistence activities are crucial for the economies, cultures, and health of Yamal Indigenous communities, they are now threatened by a mix of factors – in particular climate change and ongoing oil and gas development in the region. Today, Yamal is at the core of petroleum development in Arctic Russia and produces more than 80% of Russia's natural gas. The oil and gas industry plays a crucial role in the economy of the Yamal region and has transformed it into one of the richest regions in Russia. However, the situation may look very different in the future: many of the currently active oil and gas fields in West Siberia are maturing.

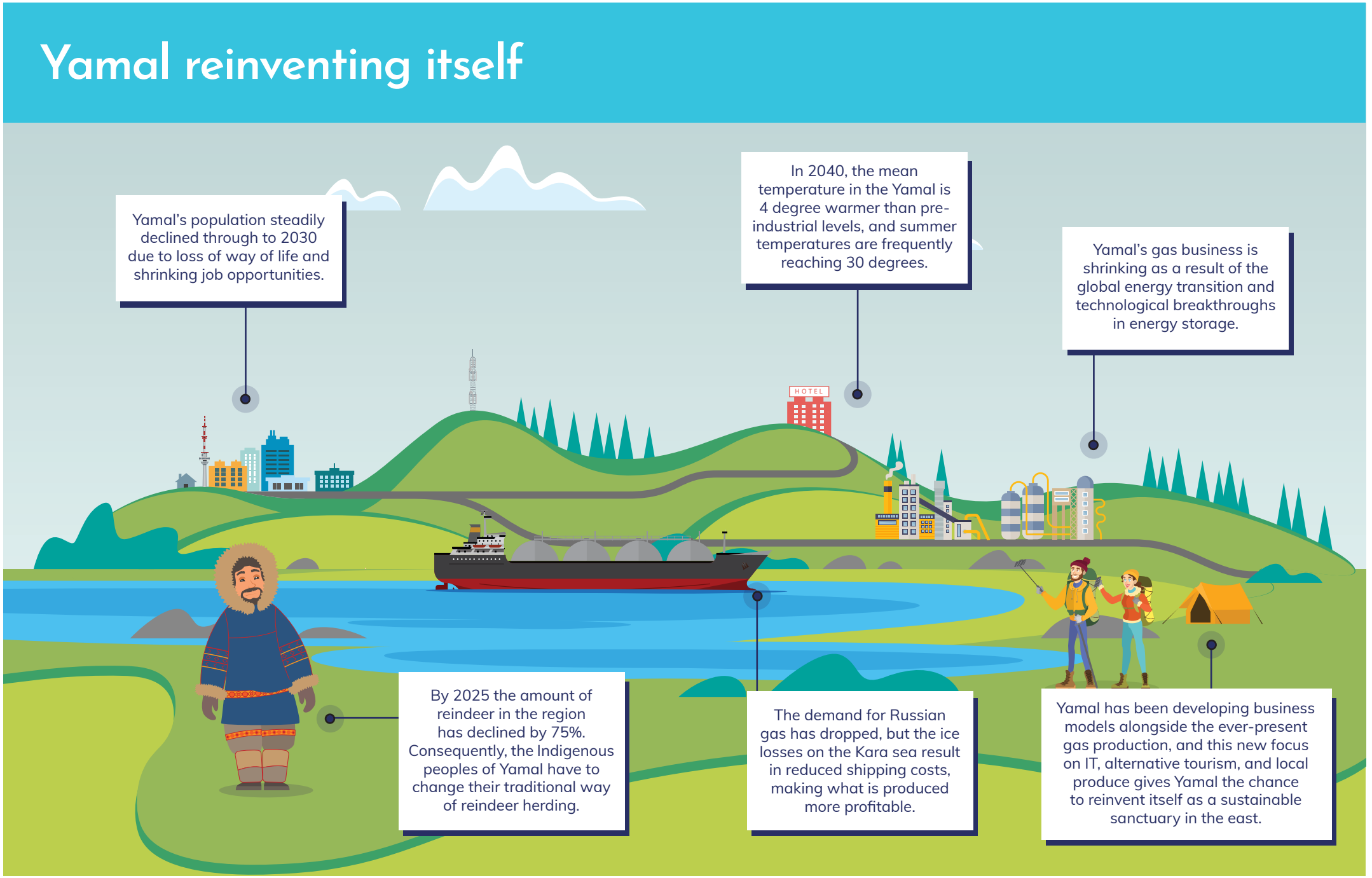
The Yamal region is experiencing dramatic environmental changes due to climate change. Sea ice decline, permafrost thaw, coastal erosion, and rain-on-snow events are already threatening Yamal communities and infrastructure as well as flora and fauna. Climate change is a very important but not the only driver influencing the developments in the Yamal region. The future of this region is a complex issue afflicted with many uncertainties. Examples of such uncertainties are:

- global supply and demand trends for energy resources (including oil price trends)
- progress in energy efficiency and market share of renewable energy sources
- the macroeconomic situation in Russia, specifically the future of the Russian energy policy
- the geopolitical situation in the Arctic and in other regions
- development of climate policies and regional and national regulations for resource development, transportation, and environmental protection.

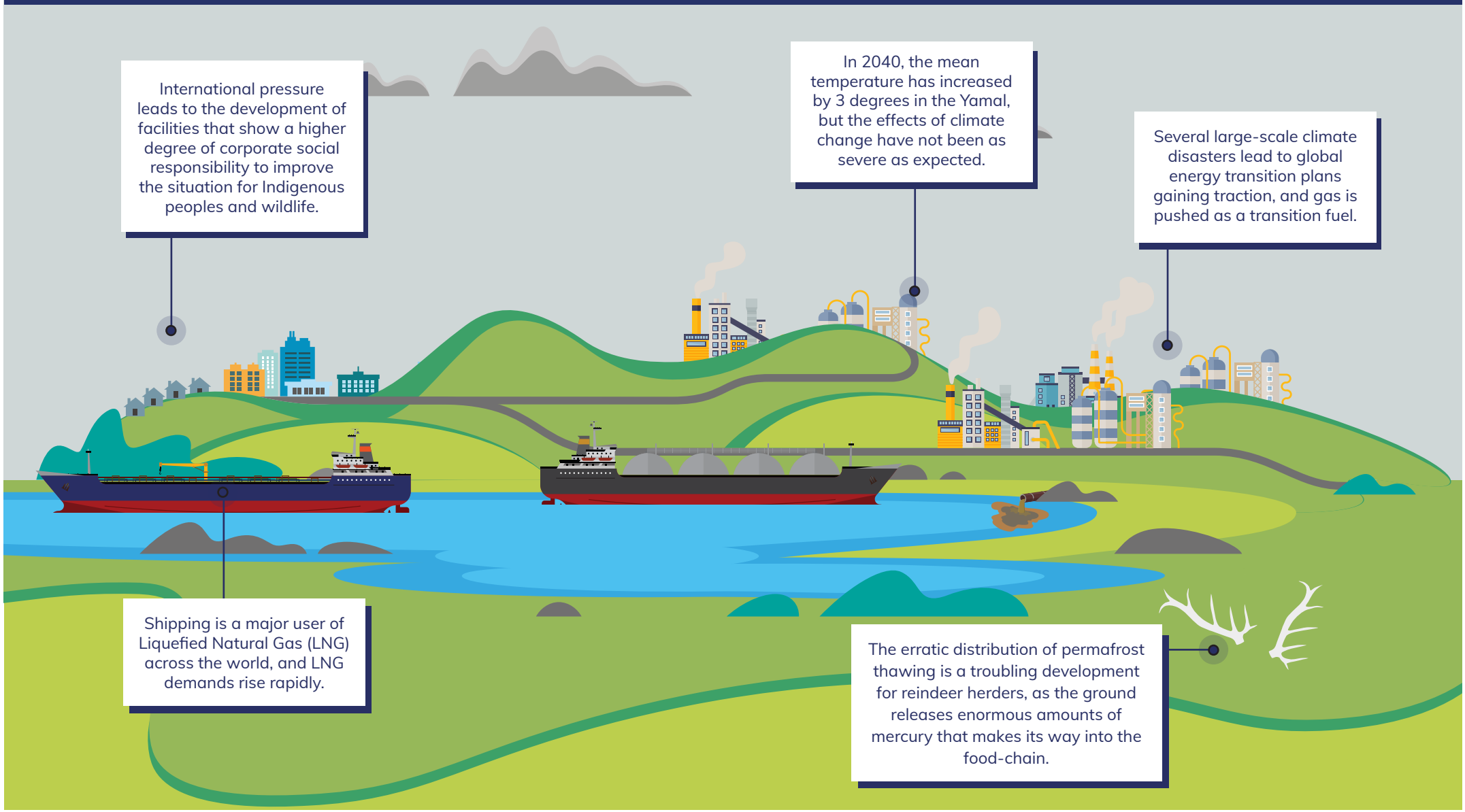
The objective of the "Yamal 2040" case-study was to respond to the situation of general uncertainty and to develop forward-looking scenarios to better understand the risks and opportunities associated with future transformations in the Arctic.

Three future scenarios were developed together with stakeholders at a series of workshops. The scenarios take into account climate predictions as well as possible environmental, social and cultural concerns, economic opportunities, and political and legal developments. Representatives of different stakeholder groups (Indigenous Peoples Organizations, and environmental NGOs, local communities, Yamal industry, the media etc.) were involved from the beginning of the project and acted as co-authors of the elaborate scenarios. The scenarios envision different futures for the region. In one of them, Yamal's petroleum business is shrinking as a result of a global energy transition. In another scenario, Yamal's gas industry is booming because gas is viewed worldwide as a "transition fuel". In two scenarios, Yamal experiences severe consequences of climate change, such as rain-on-snow events, or anthrax outbreaks and mercury releases out of thawing permafrost which create life-threatening challenges for Indigenous communities. In contrast, the third scenario projects cooling instead of warming in Yamal and Europe resulting from the interaction of a number of unexpected factors. Participation in the construction of scenarios provided stakeholders with an opportunity to deepen their knowledge about the impacts of climate change and their interaction with other factors that influence the future of Yamal, as well as to reflect on own ways how they think about the future. In a second phase of the project, strategic options were developed together with stakeholders, to enable proactive preparation for possible future developments.

Yamal reinventing itself



Gas Boom

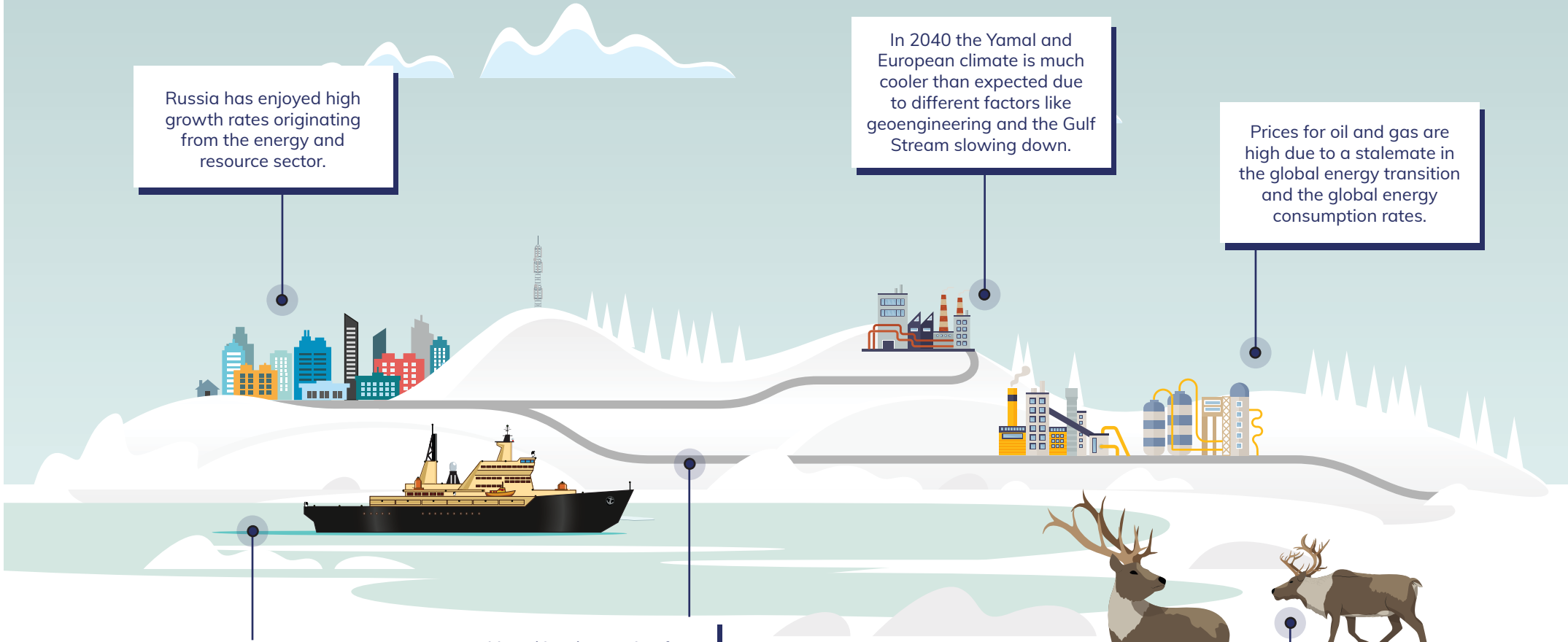

International pressure leads to the development of facilities that show a higher degree of corporate social responsibility to improve the situation for Indigenous peoples and wildlife.
In 2040, the mean temperature has increased by 3 degrees in the Yamal, but the effects of climate change have not been as severe as expected.
Several large-scale climate disasters lead to global energy transition plans gaining traction, and gas is pushed as a transition fuel.
Shipping is a major user of Liquefied Natural Gas (LNG) across the world, and LNG demands rise rapidly.
The erratic distribution of permafrost thawing is a troubling development for reindeer herders, as the ground releases enormous amounts of mercury that makes its way into the food-chain.

The Snow Queen

Russia has enjoyed high growth rates originating from the energy and resource sector.

In 2040 the Yamal and European climate is much cooler than expected due to different factors like geoengineering and the Gulf Stream slowing down.

Prices for oil and gas are high due to a stalemate in the global energy transition and the global energy consumption rates.



Permafrost is stable and the Kara Sea is covered with ice flows even in the summer, impeding shipping activities.

Yamal is a key region for expanding gas production, however, other sectors such as infrastructure and chemistry flourish.

Programs for the economic, social and ecological improvement of oil and gas extraction are implemented after large-scale protests across Russia.

Blue-Action is a major European research project investigating the effect of a changing Arctic on weather and climate.

It involves over 120 experts from 40 organisations in 17 countries, pooling expertise to improve how we model and predict the impact of warming in the Arctic region.

Through a combination of empirical scientific research, advanced statistical techniques and enhanced climate modelling, it aims to improve understanding of the impact of Arctic warming on regional and global atmospheric and oceanic circulation.

Image by Oldag Caspar, Germanwatch.

Conclusion

All stakeholders need to address the questions of how to act in face of such an uncertain future for Yamal and what can or needs to be done today in order to proactively prepare for potential long-term developments. There are two main challenges:

- First, no one can prepare for every possible development because resources and attention are limited.
- Second, preparing for just one scenario (regardless of the selection criterion) would be betting on a single future.

Stakeholders therefore have to prepare strategic options that might be robust under alternative scenario conditions. Options for various stakeholders discussed include increasing education for the local population, promotion of political participation, creation of federal commissions to encourage research and discussion, and better integration of climate risks into management structures.

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