

# INGVIL SMINES TYBRING-GJEDDE

## Non-Executive Director at Norge Mining

Thank you so much. Your Excellencies, ladies and gentlemen, dear friends, I am really honored to speak to you today on this crucial topic of the geopolitical dimensions of the future supply of critical raw materials. I am also delighted to be back here in beautiful Abu Dhabi. The last time I visited this very hotel was on an official visit by His Highness Crown Prince Haakon of Norway. The visit occurred at the same time as a volcano erupted in Iceland and more or less all flights all over the world were grounded. Two years now into the coronavirus situation, we have learned that digital meetings have kept the wheels running but it is not possible to cooperate and find solid solutions to great challenges without meeting people face-to-face. I therefore give my special thanks to the organizers of this conference. Being able to have us all here together safe and with excellent logistics during a pandemic is really outstanding, so thank you so much for that.

Travelling all over the world as the Norwegian former Minister of Public Security and Deputy Minister of Petroleum and Energy, I discovered that cooperation, technology and common understanding of the challenges are key enablers of finding successful solutions. Since Norway first discovered oil and gas on our continental shelf more than 50 years ago, petroleum has become our largest economic sector, both in terms of value-added government revenues, investments and export value. However, we did not become an oil and gas nation completely on our own. The presence of international companies was essential from the beginning and to this day and such players are key contributors to the Norwegian petroleum sector. With the challenging conditions in the North Sea and non-negotiable environmental issues, the industry developed technology, skills and services that are sought after in all major oil and gas provinces around the world today. These are the same conditions the mining industry must front, and this is what Norge Mining is fronting every day in all aspects of what we are doing. I believe we will come back to these issues a bit later in the discussions.

The geopolitical dimensions of future supply of critical raw materials are vast, weighty subjects and with that in mind, I would like to focus on three specific areas: the origins and ambitions of Norge Mining, the company I represent; the CRMs we are investigating vis-à-vis Europe's energy transition; and Norway's role in boosting resource security.

Let us start with Norge Mining itself., an Anglo-Norwegian natural resources company. It exists because we knew that Norway was sitting on large, untapped reserves of phosphate, titanium-bearing ilmenite and vanadium. That was thanks to earlier studies carried out by the Geological Survey of Norway, and the NGU is a Norwegian government agency responsible for geological mapping and research. Norge Mining currently owns 46 exploration licenses in southern Norway, totaling more than 400 square kilometers. Since we began our own investigations in early 2018, we now understand that there are large deposits of all three of

those EU critical raw materials. Initial exploration results have exceeded all expectations and confirm two world-class deposits at Uraigr and Storiknoten. The Bjerkreim exploration project contains in excess of 70 billion tons of mineralize rock, which is significant because CRMs are not just important to Europe, but to the wider world.

As we all know, the transition from fossil fuels to green energy can only take place if we expand the use of renewables in tandem with better resource management and of course, efficiency. We also know that CRMs are essential to build the energy systems of tomorrow, such as wind turbines, solar panels and batteries. Let me give you some examples of that. To produce a 3MW wind turbine takes up to 4.7 tons of copper, while manufacturing an electric vehicle requires six times the amount of CRMs as a conventional car. It is little wonder then that it is estimated that demand for CRMS will quadruple to implement the targets of the Paris Agreement by 2050.

Going back to Norway's deposits of the three EU critical raw materials. Vanadium is likely to become more pivotal because vanadium redox flow batteries are scalable and safe, do not degrade and have infinite lifecycles. That makes them perfect powerhouses to store vast amounts of renewable energy. Titanium is already an essential component in several renewable energy system applications. Lightweight with extraordinary strength and anti-corrosive, these characteristics will gain in importance as offshore wind installations increase, as I have already mentioned. Then there is phosphate, a fertilizer ingredient that helps feed our expanding population and, if used properly, is a more environmental-friendly solution than nitrogen-based fertilizers. It is no secret, but it is important to remind ourselves of the realities of EU and US raw material supply and demand. China currently dominates the global market, and the EU currently obtains 62% of its raw materials from China, 8% from Russia and most of the rest from African countries. Europe is a large producer of wind turbines and batteries, but the EU produces no more than 1% of the minerals needed for this production. Is this a huge problem? I think so. As a former Minister for Public Security, I will say that it is at least a huge challenge because 30 million jobs in the EU are directly dependent on access to raw materials.

In 2020, the EU Commission launched the European Raw Materials Alliance, of which Norge Mining is a member. This is a clear signal that the issue is now being taken very seriously at the highest levels. In the US, CRM sourcing has become a national security issue due to its defense and tech industries dependency on China and President Biden's clean energy agenda. It is therefore clear that other viable options need to be explored quite fast, after all that is why we are here today.

Norway has always been a reliable energy partner to the EU, as well as a preferred strategic partner with shared democratic values and a market-based economy. As a NATO member, Norway is contractually obliged to play a strategic role for both the EU and the US, the political and economic and leverage Norway's CRMS deposits can give Europe and the United States in terms of negotiating power, among other things.

I have always claimed that God must love Norway. We are rich in natural resources. We have a lot of oil, gas, wind, rain, deep valleys and tall mountains that help us with power production and thanks to hydropower, the Norwegian electricity sector is close to 100% renewable. This means that the share of renewable energy in Norway's total energy consumption, including

transport and heating, is as high as 70%. We have always been a vanguard in this respect, so my country is already a world leader in solutions to reduce or elide greenhouse gas emissions. Over the years, we have had to combine the interests of our fisheries, maritime and the oil and gas industry and to do this we have pushed the boundaries of innovation and technology. I see our vast experience in natural resources and the regulatory framework we already have with environment always at the forefront, as a fantastic foundation on which to build a new mining industry, one that will potentially provide EU critical raw materials to the world.

This is quite timely, given that a supply crisis looms. The World Bank, the United Nations, the European Commission and the International Energy Agency, the IEA, all warn that dramatic worldwide demand could outpace supply leading to a global price bonanza that could be a fast decarbonization process in jeopardy. For example, the World Bank has estimated a 10-fold demand increase for metals by 2050 and that prediction was made four years ago. Demand for electricity storage, batteries of aluminum, cobalt, lithium, manganese, and nickel alone, could rise by more than 450% from 2018 levels by 2050.

We have talked about how Norway can play a role, but what about Norge Mining? CRMs are scarce because previously their production in various deposits around the world has been uneconomic and unprofitable to extract for Western mining companies. However, Norge Mining is demonstrating that climate protection, economic viability and supply security are not mutually exclusive. That comment is no longer a buzz word, it is the new benchmark when it comes to sourcing raw materials. In our case, the profitable extraction of three critical raw materials is given and feasible onsite due to the following factors: (1) Excellent existing infrastructure; (2) very short transport distances to industrial demand centers; (3) excellent quality and quantity of ore rock without contamination by heavy metals or rare earth; (4) corruption bears costs, we all know that, but given it is not an issue in Norway, this is an additional cost Norge Mining will not have to deal with; (5) the sheer size of the deposits will allow Norge Mining to benefit from economies of scale as the extraction progress gains pace.

Protecting the environment and the climate starts at the very beginning of the value chain, namely where the raw materials are extracted from the ground. The neutralization of the carbon footprint and minimalization of the environmental impact of our Bjerkreim exploration project in southern Norway is supported and ensured by the use of innovative technologies. Future production in Norway will release significantly fewer emissions than comparable mining projects outside Europe. The massive production also creates new and sustainable jobs and generates economic value in Norway and the EU. In addition, the long transport and insurance costs from non-European projects are also eliminated because shipping transport also requires huge amounts of fossil energy and produces additional CO<sub>2</sub> emissions.

I will say a few words to finish. CRMs are fast becoming pawns in strategic and geopolitical power struggles. It is clear that green mining that minimizes environmental impact and maximizes economic potential is needed more than ever. The mining sector is an enabler of the clean energy transition and the more circular economy and at Norge Mining we take these responsibilities very seriously. It is our belief that Norway, supported by Norge Mining and all its partners of course, can be an important strategic partner to Europe and beyond and a new supplier of CRMs, replacing risk with new value chains and exciting opportunities.