



Should Greenland Mine its Uranium?

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Greenland has anywhere from the sixth to the tenth largest reserves of uranium in the world. If Greenland decides to mine these reserves, it will become a policy game changer for this non-mining, non-nuclear Kingdom.

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The world uranium industry has been undergoing a resurgence since 2002, and current supplies are not meeting demand. This increase in energy demand, coupled with concerns about energy security, is fuelling commercial interests in mining uranium. In 2010 the Greenland Government decided to relax its zero-tolerance uranium policy and allowed mining companies to explore prospects for potential uranium mining. With Greenland having the potential to become a uranium supplier, there are a range of domestic and international policy challenges that need to be addressed.

Denmark's Non-Nuclear Status

Denmark's approach to nuclear weapons has historically sought to reconcile its status as a country publicly opposed to nuclear weapons (and nuclear energy) on the one hand, with its status as a member of a military nuclear alliance on the other. Greenland plays a predominant role in this history, as it became the centre of attention in January 1968 when a US nuclear-armed bomber crashed onto the ice near the American airbase at Thule. It would later be revealed that Greenland had become one of the most nuclearised parts of the world by the late 1950s, despite

POLICY RECOMMENDATIONS

Denmark must ensure coherence between potential uranium exportation and its declared non-nuclear status. Before any decision is made on whether to mine uranium as a by-product, Greenland and Denmark should:

- **Talk to each other.** Work closely together to understand the non-proliferation issues and legal authorities that accompany uranium mining and develop a clear, substantive nuclear non-proliferation, disarmament and export control policy for the Kingdom.
- **Involve stakeholders.** Work with organisations such as the IAEA, EURATOM and the European Supply Agency (ESA), and representatives from the mining and nuclear industries, to not only understand current global reporting requirements; but also how Denmark can help to strengthen the non-proliferation regime.
- **Identify resources** that will be required to set up and maintain a system of uranium export controls, including for regular training and education in the nuclear fuel cycle and proliferation networks.



Denmark's nuclear-weapon-free status (during peacetime) which had been declared in 1957. Characterised by protest, politics, and external pressures, the Danish Parliament was repeatedly forced to reiterate Denmark's non-nuclear status over the decades, with public opposition to civilian uses of nuclear technology formalised in a 1985 resolution that nuclear power plants would not be built on Danish soil. As a whole, Denmark's history forms a larger and enduring nuclear narrative which is characterized by the profound effect nuclear weapons have on national and international relations; but it also demonstrates the desire by a non-nuclear weapon state to reduce the role of nuclear weapons in international relations. It is because of this history that Greenland's zero tolerance on uranium mining policy has remained so steadfast.

Uranium in Greenland

While Greenland continues to uphold its ban on the extraction of all radioactive elements such as uranium, the pressure is mounting to change this to allow the extraction of uranium as a by-product of mines where other minerals are the primary targets. The dilemma lies in the fact that the extraction of large rare earth element (REE) deposits will only be possible with uranium as a by-product. The discovery of REE is particularly significant as China currently controls 97% of the world's supply of these elements and pre-feasibility studies indicate that the Kvanefeld project in Southwest Greenland alone could potentially supply 20% of global rare earth metals demand. While the commercial interests in REE are significant in their own right, uranium comprises about 20% of the value of the minerals producible from this site.

The Dual-Use Dilemma

Uranium is the main ingredient of the nuclear fuel cycle, which produces fuel for nuclear reactors. These reactors, in turn, can generate electricity as well as produce weapons-grade material (uranium or plutonium) for nuclear weapons. Since the 1950s, when the first full-scale nuclear power plants went into operation, nuclear energy has come to supply almost fourteen per cent of global electricity needs. At the same time, since the first nuclear explosion in 1945, enough fissile material for 100,000 nuclear warheads has been produced globally.

The first company to be granted permission to include radioactive elements in the exploration phase was Greenland Minerals and Energy (GME), an Australian domiciled company, after it announced that it could not complete its feasibility studies of environmental health, profitability and social impact for REE mining without also including radioactive elements in the investigation, due to the high content of uranium. The Greenland government has since issued exploration licenses to two other Australian mining companies for the exploration of uranium. There is a strong majority in opposition to uranium mining on the island and a number of studies on the impact on the environment, society and economy have to be conducted before an informed and final decision can be made.

Franckly Speaking ...

In 1945 scientists involved in the development of the world's first nuclear weapon argued in the so-called 'Franck Report' that if there was unlimited trade and employment of nuclear power, the fate of every pound of uranium should be recorded. Almost seven decades since the publication of the report, the global trade of uranium ore concentrates (UOC), or 'yellowcake', remains one of the least transparent and least regulated elements of the nuclear fuel cycle.

On the Indices

Uranium is not governed and traded like other commodities. It is not traded on organised world commodity and metal exchanges; instead it is sold through individual futures contracts negotiated between buyers and sellers. Only recently have uranium price indicators been developed by a small number of private business organisations – such as the World Nuclear Fuel Market (WNFM) and the Ux Consulting Company (UxC) – to independently monitor uranium market activities, including offers, bids and transactions. While these indices offer information on uranium spot prices and futures contracts, they are opaque in terms of tracing uranium market flows. Accordingly, it is an industry that is multinational with public/private cross-ownership in which a number of interests, including commercial, strategic and non-proliferation interests, can overlap or collide. The volatility of the market, therefore, is affected not only by supply and demand, but also by geopolitical factors.

International Safeguards

Comprehensive safeguards agreements (CSA) under the International Atomic Energy Agency (IAEA) exclude mines and mills from the category 'principal nuclear facility' and do not interpret ores or ore residue as 'source material.' Authorities, therefore, have not considered uranium as a nuclear product until it is fed into enrichment plants or used as fuel for reactors. CSAs do require non-nuclear weapons states to report imports and exports of UOC with the 1997 Additional Protocol going further to require declarations of the location, operational status

and estimated (and current) annual production capacity of uranium mines, while also including UOC as a source material in its inventories. The Additional Protocol (AP), however, is voluntary. A hundred and fifteen countries have adopted it as of 20 February 2012, but a number of the major importers and exporters of uranium – as well as countries of proliferation concern – do not have an AP agreement. Additionally, although reporting on UOC trade is required by the non-nuclear weapons states, countries possessing nuclear weapons are exempt (when trading with each other) from declaration and inspection, as are their weapons programmes. Consequently, if a supplier country desires extra assurances that its UOC will not be used for weapons purposes by any of the possessor countries, a separate agreement between the two countries will be required (i.e. a bilateral agreement backed up with IAEA safeguards). Uranium suppliers such as Australia and Canada have such agreements.

Denmark's Mixed Safeguards

Presently, the safeguards agreement between the IAEA and the EU covers Denmark and the Faroe Islands, but not Greenland. Denmark has concluded a separate IAEA safeguards agreement for Greenland, but as of yet there is no Additional Protocol to that agreement. Moreover, whereas Copenhagen obtains its export control lists from Brussels, Greenland is not a part of the EU and Nuuk is responsible for its own dual-use exports. The 2009 Act on Greenland Self-Government gives Nuuk authority over a number of new fields such as mineral resource activities, courts, company law, accounting and auditing while Copenhagen remains constitutionally responsible for the Kingdom's foreign, defence and security policy. Uranium mining therefore would be a test case under the 2009 Act, requiring not only an understanding of how the Kingdom's mixed international arrangements would be impacted by uranium by-product mining, but also of how to delineate legal authority between Copenhagen and Nuuk. To this end, Denmark and Greenland should:

Talk to Each Other

As of yet officials in Copenhagen and Nuuk have not met to discuss the foreign, defence and security issues related to the export of uranium. Granted, a decision to mine uranium as a by-product has not yet been made and feasibility studies are presently ongoing, but such a decision could come within the next two years. Discussions between Copenhagen and Nuuk are critical and should be held regularly before a final decision is made on whether to lift the zero tolerance policy on uranium mining. Expertise to be shared should include officials from industry/mining, environment, trade and labour relations, as well as knowledge about the practice of export controls, IAEA safeguards and non-proliferation and disarmament policy. These discussions should also centre on how the Kingdom's non-nuclear



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status would be maintained, altered or updated should it go from being a non-nuclear, non-mining country to potentially one of the world's top ten uranium suppliers. These discussions must aim at maximising the degree of regulation: the worst-case scenario should not be that Greenland's uranium be diverted or misused for weapons purposes.

Involve Stakeholders

Along with uranium and foreign policy talks between Copenhagen and Nuuk, further discussions should be held with representatives from the IAEA, EURATOM and the European Supply Agency (ESA) as well as from industry. These international and regional organisations can provide further understanding of what safeguards, paperwork and regulatory authorities are involved in becoming a supplying member. Input received from these organisations can further help officials in Nuuk and Copenhagen delineate the legal responsibilities that would have to be developed and shared. Greenland could also discuss with the IAEA what is involved in acceding to the Additional Protocol – and hopefully conclude that AP membership would be beneficial if exporting uranium. Additionally, as Greenland has the potential to not only become an exporter of uranium, but potentially a very large uranium exporter, it can decide to maintain minimum standards or even to strengthen the non-proliferation regime by adding its own industry and non-proliferation responsibilities. If Greenland does become a uranium supplier, the Kingdom should consider taking the lead in work with other uranium exporting countries and the Nuclear Suppliers Group (NSG) to set up a working/coordinative group on uranium mining which could address how to establish international



transparency of the UOC trade – regardless of whether it is traded to states with nuclear weapons or not.

Identify Resources

Given that Greenland could become a large exporter, with upwards of 2000 tonnes of production per annum anticipated, an efficient system of accountancy and control to facilitate paperwork and standards will be required. Greenland will have to identify a body or agency that can develop and be accountable for this system while also conducting outreach to industry on its policies and procedures. It will require export control policies to be based not just on the actions coming out of Brussels, but also on the Kingdom's nuclear non-proliferation policies and on how foreign, economic, trade and intelligence requirements will be staffed, trained and coordinated between Copenhagen and Nuuk. It will also require a public administration that is educated in proliferation networks, the nuclear fuel cycle, and political developments surrounding nuclear weap-

ons and countries of proliferation concern. This is doable but the non-nuclear status of Denmark is a challenge as it means that Denmark and Greenland are both innocent and uninformed in these areas. Resources for education and training should therefore be especially emphasised in the first years of uranium by-product mining.

From Zero Tolerance to Necessary By-product?

The decision to mine uranium as a by-product is accompanied by a host of domestic and international considerations. The three steps suggested in this Policy Brief address the need for both Greenland and Denmark to gain a professional understanding of these considerations and their relation to the 2009 Act on Greenland Self-Government. These steps are achievable and they are essential before any final decision is made on whether Greenland will move from a policy of zero tolerance to an acceptance of mining uranium as a necessary by-product.

FURTHER READING

“Nuclear Power in the World Today”, World Nuclear Association, Updated 2011, <http://www.world-nuclear.org/info/inf01.html>
“The ‘Franck Report’. A Report to the Secretary of War”, June 1945, <http://www.fas.org/sgp/eprint/franck.html>

The opinions expressed in this policy brief are those of the authors alone and do not necessarily reflect the official opinion of the Danish Institute for International Studies.

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