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# Radioactive minerals in Greenland : geological, legal and political fluctuations of nuclearity (1950-2022)

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## Introduction

Rare Earth Elements (REE) are a group minerals used in communication technologies and the so-called « green technologies » such as wind turbines, solar panels, and all sorts of batteries<sup>1</sup>. Because of these uses, their industrial demand is increasing and it affects Greenland, which hosts large deposits. In 2022, a third of the exploration licenses are REE oriented and for the moment no exploitation has been launched, even if Tanbreez company has an exploitation licence for the Killavaat Alannguat mountains<sup>2</sup>. If this context announces the deployment of exploitation, it is quite complex to set up this production in Greenland. Industrial mining meets consensus, but the way to manage radioactivity, which is present in subsoil, causes social and political tensions. Radioactive minerals, as well as radioactive location of resources, raise health and geopolitical issues. For the past ten years, *Inatsisartut*, the Parliament, has been trying to establish a legal framework dedicated to radioactive resources, and the country has gone through a social mobilization against uranium mining demanding regulations. In November 2021, the vote of a law limiting uranium content in the ore was passed, calming down the conflict around radioactivity. Nevertheless, I make the hypothesis that the case is not closed, and that REE are beginning to play a significant part in the way radioactivity is addressed in Greenland. Indeed, these minerals are often naturally associated with uranium and thorium, they usually emit radioactivity themselves, and radioactivity can be generated during the refining process<sup>3</sup>. Then, they are concerned by similar environmental and health issues

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1 Fizaïne Florian *Les métaux rares : opportunité ou menace ? Enjeux et perspectives associés à la transition énergétique*, éditions Technip, deuxième édition, 2020.

2 Greenland Mineral Resources Authority, <https://govmin.gl/>, consulted 01/06/2022.

3 Charles Nicolas, Johann Tuduri, Gaétan Lefebvre, Olivier Pourret, Fabrice Gaillard, *et al.*. « Ressources en terres rares de l'Europe et du Groenland : un potentiel minier remarquable mais tabou ? » in Decrée Sophie et Boulvais Philippe *Ressources métalliques : cadre géodynamique et exemples remarquables*, ISTE Science Publishing Ltd, Wiley, 2021. hal-03138953; Giannuli Aldo « Le marché des terres rares » *L'esprit du temps*, « Outre-Terre », n47, Vol 2, 2016, pp214-222 ; Guilhaudis Jean-François, Jacques Fontanel « Les “ terres rares ” et autres matériaux critiques et stratégiques, au cœur des conflits de demain ? » *Paix et sécurité européenne et internationale*, université

than uranium. The main difference is that REE benefit national and international political support, mainly thanks to their uses in the so-called “green technologies”<sup>4</sup>. The hypothesis I am gonna explore in this communication is that the history of uranium and the political surroundings of REE lay the groundwork for REE to assert themselves as a viable radioactive resource in the years to come. REE mining projects are shaping the new conditions for radioactive minerals and deposits’ exploitation.

Firstly, I will present REE and their geopolitical surroundings. Secondly, I will trace a history of radioactive materials in Greenland using the concept of nuclearity. Then, I will focus on REE political capacities basing my talk on three REE mining projects.

## **Part 1. Rare Earth Elements: metals, geopolitics and deposits**

The name “rare earth elements” refers to a group of 17 to 20 minerals that have been brought together under one group because of their common electromagnetic characteristics. They conduct and store energy very efficiently. They belong more broadly to the family of rare metals, characterized by their common strategic economic and industrial values, like nickel, cobalt and gold. Because of these properties, these metals are used in the manufacture of batteries and energy transition technologies. The term “rare” does not refer to a shortage of these metals, but to the technical and geopolitical issues faced by industrialists and states in search of these resources. REE are widely distributed on the globe, but their entanglement in rock layers makes their extraction difficult. This is made even more complex by the presence of uranium and thorium, which requires radioactivity management systems<sup>5</sup>. Due to this geological configuration, separation techniques are proving to be environmentally costly, as underlined by the investigations conducted on rare metals mines in China and Latin America<sup>6</sup>. Moreover, REE are difficult to recycle, which leads to a huge loss of minerals and dependence on continuous extraction. Indeed, they are always transformed into alloys using rapidly evolving technologies, which does not give time for the establishment of standardized recycling channels<sup>7</sup>. These conditions discourage countries to start mining on their soils, and they have contributed to the current distribution between producer and buyer states, which makes this resource a major geopolitical issue.

At the end of the 20th century, European countries, the United States and Japan had rare metals mines but they decided to relocate because of the environmental problems they generated. They targeted regions in economic difficulty that would be more compliant with this issue and, then Latin America, South Africa and China specialized in extraction and transformation of REE, and they suffered the ecological and social damages of this production. Today, China has a monopoly with the Baotou mine in Inner Mongolia, which extracts 75% of the total production of REE. The

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Côte d’Azur inPress. hal-03294026.

4 Naalakkersuisut *Greenland’s oil and mineral strategy 2014-2018* Bureau of minerals and petroleum, Government of Greenland, Nuuk, 2014; Bjørst, L. R., & Rodon, T. “Progress Stories and the Contested Making of Minerals in Greenland and Northern Québec”. *Extractive Industries and Society*, 2021 [100941].

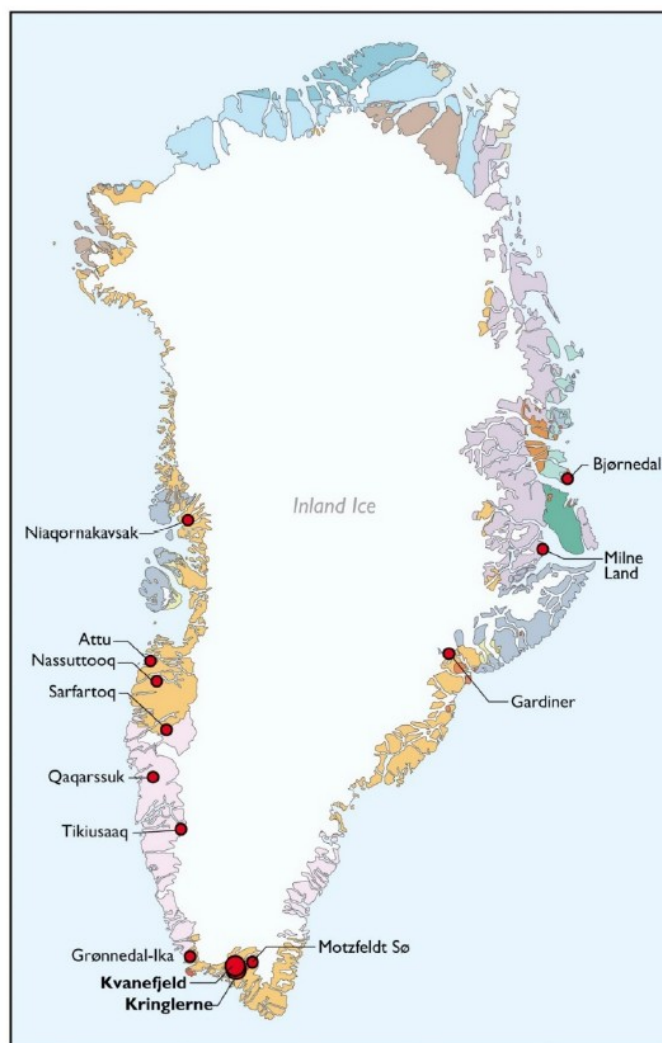
5 Dushyanthaa Nimila, Nadeera Batapolaa, I.M.S.K.IIankoonb, Sudath Rohithaa, Ranjith Premasiria, Bandara Abeysinghea, Nalin Ratnayakea, Kithsiri Dissanayakea « The story of rare earth elements (REEs) : Occurrences, global distribution, genesis, geology, mineralogy and global production » *Ore Geology Reviews*, n122, 2020.

6 Klinger, Julie Michelle *Rare Earth Frontier : from terrestrial subsoils to lunar landscapes* Cornell University Press, 2017.

7 Dunlap, Alexander « End the “Green” Delusions: Industrial-scale Renewable Energy is Fossil Fuel », billet de blog, Verso, 10 mai 2018. En ligne <https://www.versobooks.com/blogs/3797-end-the-green-delusions-industrial-scale-renewable-energy-is-fossil-fuel> [consulté le 16/11/201]

country also masters the transformation into alloys, and thus holds 90% of the world REE market<sup>8</sup>. At present, Europe is trying to find new sources of supply to reduce its dependence on China, and Greenland appears to be a realistic option in this respect. For now, no mine is operating there, but several mining projects are under way.

With 13 occurrences and 9 deposits today discovered (Figure 1), the country would have 11% of the world reserves. South Greenland is a particularly targeted region as it hosts what is currently the world's second largest deposit, Kuannersuit/Kvanefjeld and Killavaat Alannuat/Kringlerne mountains<sup>9</sup>, which constitute a single geological entity<sup>10</sup>.



**Figure 1:** REE occurrences in Greenland.  
Source : Kristine Thrane, Per Kalvig, Nynke Keulen “REE deposits and occurrences in Greenland“ ERES2014: 1st European Rare Earth Resources Conference|Milos|04-07/09/2014, Actes du colloque, p305.

8 Chen, Zhanheng “Global rare earth resources and scenarios of future rare earth industry” *Journal of Rare Earths*, Vol 29, n1, 2011, pp 1-6; Pitron, Guillaume *La guerre des métaux rares. Les liens qui libèrent*, Paris, 2018.

9 The first name is in *kalaallisut*, the national language of Greenland, and the second one is in danish.

10 Kristine Thrane, Per Kalvig, Nynke Keulen “REE deposits and occurrences in Greenland“ ERES2014: 1st European Rare Earth Resources Conference|Milos|04-07/09/2014, Actes du colloque, p305.

Between 2007 and 2021, two mining projects focused on Kuannersuit/Kvanefjeld and Killavaat Alannuat/Kringlerne mountains, shedding light on another resource, uranium. Whereas both uranium and REE are radioactive minerals, uranium took the stage. Nowadays, the way in which radioactive minerals are addressed is influenced by the uranium conflict around these mountains and the legal set up it created. So, to examine REE, we have to understand uranium and radioactivity, and particularly their association with a nuclear quality.

## **Part 2. The nuclear properties of radioactive minerals at the crossroads of independence politics**

Using the concept of nuclearity, I refer to the work of the historian Gabrielle Hecht, who distinguishes a radioactive property from a nuclear property<sup>11</sup>. She explains that radioactivity is a physical quality, designating the phenomenon of radiation, whereas nuclear is a political and technical construct. To say that a mineral, a production or an energy is nuclear means the mobilization of a particular social and political context. Here, I will trace a history of nuclearity in Greenland in order to understand the specific way in which REE are presented and represented today.

In Greenland, history of nuclearity begins in the 50s. At that time, Greenland was under Danish rule and Denmark sought to develop new industries to support the island's budget<sup>12</sup>. Greenland was completely financed by the Danish Government, and nowadays half of the budget still comes from Denmark. To this end, Danish authorities launched a systematic geological research that led to the discovery of uranium and REE deposits at Kuannersuit. At that time, uranium only mattered because there was no industrial use for REE. From the 50s to the 80s, the Danes tried to use it for their nuclear power plants, and they established a mine project. Two elements led Greenlandic population and politicians to oppose it. Firstly, Greenland was going through an independence movement. At the end of the 70s, it had obtained political autonomy but not sovereignty over the land, which remained into Danish hands. The Kuannersuit mine project then represented a continuation of imperialism and uranium became the symbol of a post-colonial exploitation. Secondly, environmentalist and anti-nuclear movements were spreading on a global scale and it entered Denmark, which population demanded the end of the atom energy in the country. This massive anti-nuclear movement spread to Greenland and fed the national opposition<sup>13</sup>. Here, uranium's exploitation became associated with a nuclear nature, seen as environmentally dangerous and synonymous of imperialism.

In 1983, Danish government responded to this movement by announcing the denuclearization of the country, which led to the abandonment of the Kuannersuit uranium mine project. This decision was followed in Greenland by the enunciation of a principle of non-exploitation of uranium and

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11 Hecht Gabrielle *The radiance of France. Nuclear power and national identity after World War II*, Cambridge, The MIT Press, 1998; Hecht Gabrielle *Being Nuclear : Africans and the Global Uranium Trade*, The MIT Press, Cambridge (Massachusetts, USA) & London, 2012.

12 Sørensen Axel Kjær, *Denmark-Greenland in the Twentieth Century*, s.l., Museum Tusulanum Press, « Meddelelser om Grønland: Man & society », 2009, vol. 34.

13 Sørensen Henning « Grønlands uran og thorium » *Tidsskriftet Grønland*, vol 4- 5, 2008, pp 192- 203; Heymann M., Knudsen H., Lolck M. L., Nielsen H., Nielsen K. H. & Ries, C. « Exploring Greenland: Science and Technology in Cold War Settings. » *Scientia Canadensis*, vol33, n2, 2010, pp 11–42.

caution with respect to radioactivity. This was not a law, but a guiding principle that would mark Greenland's national identity and independence movement. This ban acknowledged the nuclear nature of uranium and radioactivity, and it represented the first achievement in Greenlandic legal and political control of the land. The nuclear nature of radioactive minerals then contributed to the construction of national identity and independence. Also, it was associated with a moral ecology that was qualified Inuit and Greenlandic by opponents and referred to “*nuna*”, which is an emic greenlandic word meaning the symbolic, social and economical relationships between inhabitants and territories<sup>14</sup>.

In 2009, Greenland reached the current political regime with the objective of leading the country towards economic independence. This objective was driven by the strategy of "mining independence", which consists of replacing the Danish contribution to the Greenlandic national budget by tax revenues from mining activities. One of the instruments of this strategy was the enactment, the same year, of Greenland's first Mining Act on land use and mining activities. It marked the recovery of Greenlandic sovereignty over the land and the revival of the mining industry<sup>15</sup>. Between 2000 and 2009 two mines have been operating and they closed, and since 2009 only one is producing. Then, accelerating this development became the political priority and radioactive minerals played a central legal and industrial role in that idea. The same year, Greenland government urged the Parliament to abandon the ban on uranium in order to allow the exploitation of minerals that it considered as “strategic”<sup>16</sup>. According to the Ministers declarations, “strategic” refers to the geopolitics of minerals and designates resources developed by the energy transition, such as uranium and REE. Uranium, because of the low carbon emissions of nuclear power plants, and REE, for the uses I have already outlined.

In 2011, the issuance of a license for uranium exploration in Kuannersuit/Kvanefjeld to the Australian mining company Greenland Minerals underlines the administrative abandonment of the precautionary principle on radioactive minerals. This company already had a license for REE and zinc, and thus came to embody Greenland's new mining “strategic” policy. Members of the government then made statements in favor of radioactive minerals and praised the possibilities of clean ways of mining. In 2013, this orientation was confirmed by the legal repeal of the ban on uranium and radioactive minerals, demonstrating the political will of denuclearization of these resources<sup>17</sup>. This repeal is legally a resolution and engaged the Parliament in establishing a legal framework for radioactive minerals.

From that point on, the political scene and Greenlandic society split in two. On the one hand, Kuannersuit/Kvanefjeld’s project supporters saw uranium and REE as the industrial key to independence. They believed that radioactivity could be controlled and that Greenlandic uranium could feed peaceful and green nuclear power plants. On the other hand, the anti-uranium side maintained a nuclear attitude and rejected radioactive minerals for two main reasons. According to them, it would pollute and damage the environment, which is already disturbed by the climate crisis

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14 Bailleul Pia « Gisements nationaux et terres communes : étude des reconfigurations juridiques, géologiques et politiques des traitements des sols et des sous-sols groenlandais à partir de l’ethnographie du projet minier de Kuannersuit » Thèse d’Anthropologie, Université de Nanterre, 2022, see pp 367-383.

15 Bailleul, Pia « Étude des législations minières groenlandaises (1932-2021) : indépendantisme minier, usages des terres et conflits sociaux » *Nuevo Mundo Mundos Nuevos*, Questions du temps présent, 2021, en ligne : <http://journals.openedition.org/nuevomundo/85433>

16 Bailleul 2022, *Op. cit.*, pp 373-379.

17 Thisted, Karen « Emotions, finances and independence. Uranium as a “happy object” in the Greenlandic debate on secession from Denmark » *Polar Record*, 56, 2020.

(see Figure 2). Also, it would integrate Greenland into a geopolitical scene that the country could not manage. In this period of time, REE disappeared from news and parliamentary debates, even if geological campaigns were deployed by the Government to establish their future exploitation, and even if Kuannersuit/Kvanefjeld's uranium was intertwined with these minerals.



Figure 2: Demonstration against uranium mining, Spring 2016.  
Source : ©Pia Bailleul

Despite social divisions over uranium and radioactivity, Greenlandic Government maintained its pro-uranium policy by having Greenland adhere to a set of international conventions on nuclear safety in 2015 : the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, the International Atomic Energy Agency (IAEA) Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, the International Convention on the Suppression of Acts of Nuclear Terrorism, the International Labour Organization (ILO) Convention n°115 on the Protection of Workers from ionizing Radiation, the IAEA Convention on Physical Protection of Nuclear Material and the IAEA Convention on Nuclear Safety<sup>18</sup>. The purpose here is not to detail them, but to emphasize that they were considered by the Government as a legal framework for radioactive minerals production. They substituted for the establishment of a national legislation and made these materials exploitable resources. Thus, radioactive minerals's nuclearity was reactivated under the prism of international diplomacy. The diplomacy recognizes the dangers of such production and affirms that they are manageable by States. In this way, these treaties allowed the government to place Greenland into the geopolitical network of minerals and to assert its independence among this market. From that point, nuclearity was no longer linked to the 80s' post-colonialism, but it was associated to the process of independence through mining and statehood.

During that time, uranium mining opponents maintained their anti-nuclear position through demonstrations and parliamentary attempts, leading to an unexpected turn. Between December 2020 and March 2021, the movement grew and provoked the Minister of Resources' resignation. This led to new elections that put an anti-uranium party in power in April 2021<sup>19</sup>. In last December, this government passed a law limiting the uranium content of resources in mining activities, saying

18 Bailleul 2022, *Op. cit.*, p380.

19 The transition is from Siumut to Inuit Ataqatigiit as Government leaders.

it was politically and ecologically to dangerous to fully engage with radioactive minerals<sup>20</sup>. This law may put an end to the Kuannersuit project, which is currently under review, and it slowed down the anti-uranium movement. Uranium is thus again politically and legally recognized as nuclear, but it is also recognized as present and somehow manageable in the mining process. I refer here to the fact that during the parliamentary debates, opponents declared that uranium was present in the country's soils, and that a total ban would not allow mining activities to begin. With mining independence remaining the central objective, they had to compromise around uranium's legislation. So now, mining companies, the government and society must deal with a 0.01% limit on uranium content in the resource being mined, and uranium production is forbidden. Also, the last article of the law is a provision for ban or limitation of any other radioactive minerals, and the Minister of Resources said at the moment of the vote that REE and thorium could be the next target, depending of the evolution of the mining industry and the will of society.

In light of this history, the nuclear quality of uranium seems to have stabilized. A compromise has been found on nuclearity by limiting uranium, paving the way for other radioactive minerals to become viable resources, such as REE. The study of three REE mining projects shows the social and political capacities they got from this history of nuclearity.

### **Part 3. Rare Earth Elements in Greenland : after nuclearity, forging political and social capacities of radioactive minerals**

Since the introduction of the uranium ban in December 2021, radioactivity seems to have disappeared from Greenland, in the sense that it is no longer discussed in press or Parliament. Nevertheless, REE emit radioactivity and one can already see how mining companies and citizens deal with it with various strategies. These strategies reveal how the social and political identity of REE is being shaped by various actors, taking into major consideration the history of uranium and the industrial uses of REE in the so-called “green” technologies. I will study three mining project to explore that idea.

The first case is the REE and uranium complex Killavaat Alannguat/Kringlerne and Kuannersuit/Kvanefjeld mountains. The first one has a rare metals operating permit held by Tanbreez company, but the mine is not yet constructed, and the second one is targeted for a REE, uranium and zinc mine by Greenland Minerals. In 2018 and 2019, I conducted fieldwork in the southern towns of Qaqortoq, Narsaq and Qassiarsuk, which are located next to the projects. Inhabitants always addressed the projects by comparison of their radioactive content. They were mostly critical of the Kuannersuit/Kvanefjeld project because of the radioactive content of the ore, and they were mostly supportive of the Killavaat Alannguat/Kringlerne rare metals project thanks to the supposed absence of uranium and radioactivity. From that difference, social and political capacities were elaborated. The license granted in 2020 to the industrialist Tanbreez in Killavaat Alannguat/Kringlerne was seen as a regional development and as an asset to the strategy of “mining independence”. Plus, this mine was seen as “environmentally friendly”, because it would not pollute as much as Kuannersuit/Kvanefjeld project, and because it would produce resources used in “green” technologies. Thus, this mine and its production were perceived in a positive way, a fact reinforced

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20 Inatsisartut (Greenlandic Parliament) « Lov om forbud mod forundersøgelse, efterforskning og udnyttelse af uran mv. » Law n°20 of the 01 December 2021.



by the choice of the industrialist to use only mechanical methods of refining, a method that does not generate radioactivity.

According to my preliminary investigations, there is actually radioactivity at Killavaat Alannuat/Kringlerne, but it is hard to find because of the lack of documentation about it. It is a stable background radioactivity generated by small amount of uranium and thorium<sup>21</sup>. So, the thing to note is that this geological setting is not known locally or is ignored, a fact reinforced by the comparison with Kuannersuit/Kvanefjeld. The mining company seems to be aware of this asset because its public communication is partly based on it. On the website, we can read that one of the “key features of the project” is that “There are only background values of thorium and uranium in the [ore], meaning the final REE contains no radioactive elements”<sup>22</sup>. Here, the comparison by which the project is viewed, being told or not, permits to present a controlled radioactivity. The same mechanism acts on the ground, among the population. Then, this historical background seems to have established a legal and technical frame of what is not possible about uranium – radioactivity values, pollution, international diplomacy, etc – that industrialists uses to enlighten REE features, and that determines how uranium containing ores are perceived by people.

The second case study is Motzfeldt Sø. It is interesting to locate it from a map used by Stallion Resources, the company (Figure 3). The map was shown to investors to present the project.

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21 Gronholt-Pedersen Jacob (Reuters), Onstad Eric (Reuters) “Geopolitics is making two rare earths mining projects in Greenland more complicated” in *Arctic Today*, 3 March 2021. Consulted 10/06/2022

<https://www.arctictoday.com/how-geopolitics-is-complicating-two-greenland-rare-earths-mining-projects/>;

Schonwandt Hans K., Barnes Gregory B., Ulrich Thomas “The world-class REE deposit Tanbreez, South Greenland: Its size and structure” Conference ERES2014: 1st European Rare Earth Resources, Milos, 04-07/09/2014, online <http://www.eurare.org/docs/eres2014/fifthSession/HansKSchonwandt.pdf>, consulted 10/06/2022

22 [www.tanbreez.com](http://www.tanbreez.com) consulted 11/06/2022

## MOTZFELDT & THE GARDAR PROVINCE: "ELEPHANT COUNTRY" FOR RARE EARTHS

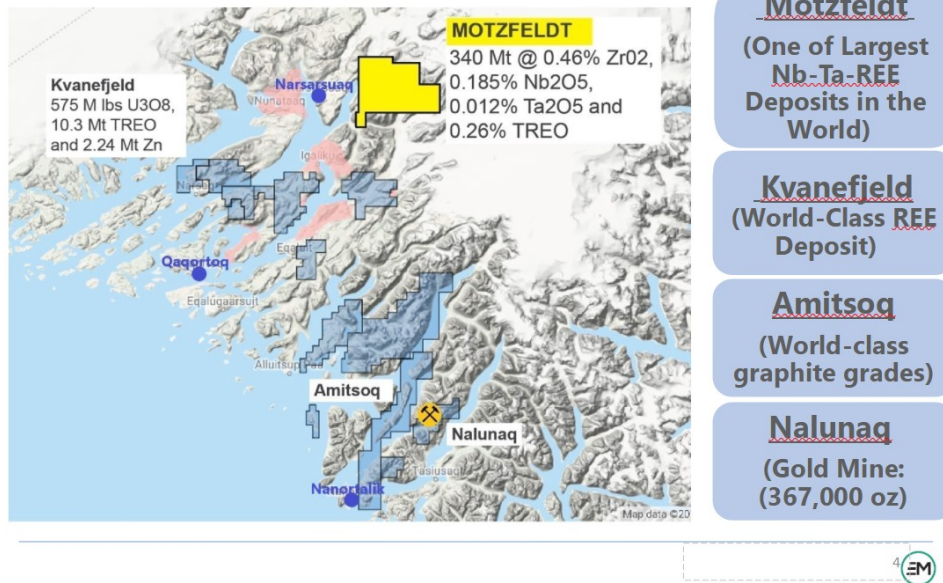


Figure 3: Motzfeldt Sø project

Source : Downloaded from <https://www.eclipsemetals.com.au/>, original name "Feb+2020+Stallion+Presentation+(Motzfeldt)+v2+(1)", p4.

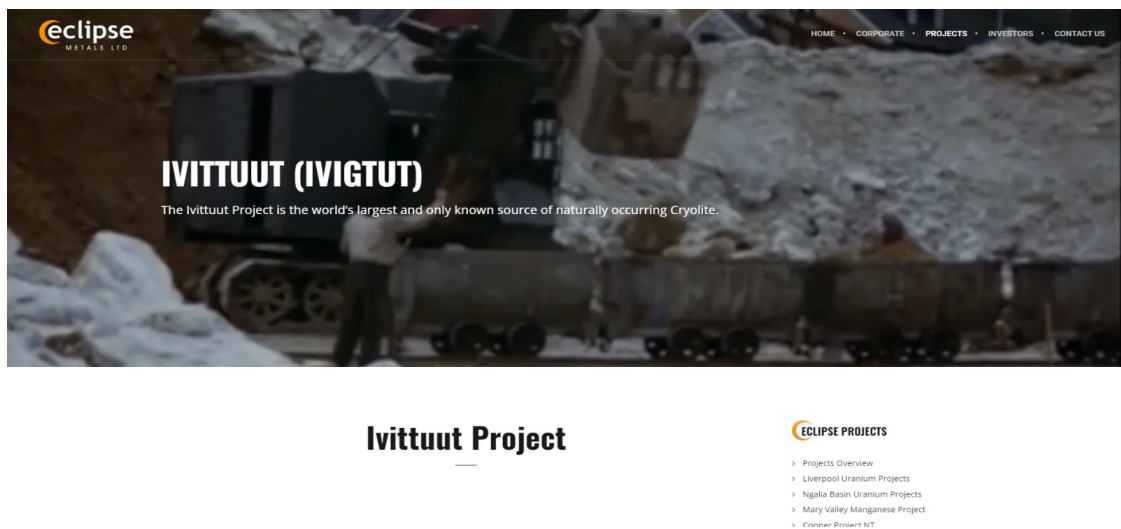
On this map, I will focus on what we see and what is not shown. What we see: a map of South Greenland with exploration licenses (Gardar Province is the geological name of the area), a list of the minerals found there with comments that are very positive, and the expression "Elephant country" to qualify the whole. The "elephant" is both the mass of licenses and the mass of minerals found there. In this light, South Greenland is a reservoir of resources, a place widely qualified as a frontier. REE are therefore to be understood as a geological "elephant", in the sense that they are very present, and as an industrial one, in the sense that they generate mining activities. What is not mentioned makes it possible to understand that they are also a political "elephant": no radioactivity, no thorium is mentioned, whereas several radiometric studies from the 80s point to Motzfeldt Sø as hosting uranium and thorium strong veins. This is certainly a caution regarding the Kuannersuit project scandal and it permits the company to focus on the "elephant", meeting here the Greenlandic policies conducted since 2000 and publicizing Greenland as a "frontier area".

This slogan is the name of the strategy by which Greenlandic government and mining administration try to attract industrialists. The "frontier area" presents the country as a land of mineral resources to be exploited, and this strategy is being built up since the 90s' by geological and economical policies. It was also publicized by various ways among the population and created a popular craze around Greenlandic minerals. *Ujarassiorit* « The mineral hunt », is one example of this rush for minerals. Implemented every year since, the aim is to find a new geological stone or mineral in Greenland. After evaluation by research centers, three to five prizes are given to the best collectors. This event, all the other public policies on minerals, and the political will to gain control on the undergrounds contributed in building an association between Greenlandic national identity and mineral resources of the country<sup>23</sup>. The "elephant country" then echoes this political and geological "frontier area", and we see here a clear convergence of interests. Motzfeldt Sø is at the first stages of exploration so the Greenlandic Government has not made any announcement about it,

23 Bailleul 2022, *Op. cit.*, pp 334-364; Bjørst and Rodon 2021, *Op. cit.* I refer to B. Andersen when talking about nationalism and ideology, Andersen Benedict *Imagined communities. Reflections on the origin and spread of nationalism*, Verso., Londres, 1983.

but the communication chosen by the company on the “frontier area” is already a hint of the political weight REE benefit in Greenland.

The last project is called Ivittuut, and it is a site that has already been mined during 150 years. Between 1850 and 1980, the mine produced cryolite and a town was built around. It was a huge part of Greenlandic history and of South Greenland life. Since the closing of the mine in 1980, the city was deserted, but it remains a high place in South Greenland where it is still occasionally visited by locals and, most of all, kept by memories and stories in present time. The mine is also vividly remembered as a major place of Greenland’s national history. Since 2018, Ivittuut is under REE exploration by Eclipse Metals company. In its communication on the project, it is precisely on that history that the mining company capitalizes on. It turns Ivittuut’s past into an asset, and presents its projects as socially valuable. It says that the project could re-use the abandoned infrastructures, and therefore its impact on the landscape would be low. It would revitalize the site and create a new life for the city through employment. It would finally promote and rely on a character already attributed to Ivittuut, its mineral wealth. In short, the company presents the idea of a mine in Ivittuut as in itself convincing, as having a natural and logical side, since it is a place historically created by the mine. On the company website, communication strategy is about creating a sense of continuity between cryolite production and REE production, as Figure 4 shows it. It is a screenshot from the welcome website page. It displays together black and white videos and photos of the cryolite era with current photos and videos of the area under the REEs’ exploration.



**Figure 4:** Screenshot of Ivittuut's project website  
Source: <https://www.eclipsemetals.com.au/>, consulted 14/06/2022

In addition, communication from Eclipse Metals, the company that holds the license, relies on a public/private collaboration on geological exploration. It claims to have employed a PhD candidate for its preliminary research and to have appointed geologists from public universities<sup>24</sup>. It is emphasized that it will allow Greenland to better know its soils, in a political dynamic of empowerment. This collaboration permits Greenland to act without Denmark to be involved. Here, the “mining independence” the company is using echoes to the political and historical struggle of Greenland to control its undergrounds and to achieve independence. Pointing to the history of mining (cryolite) and of decolonization, this communication strategy underlines the nationalist

<sup>24</sup> Eclipse Metals Website <https://www.eclipsemetals.com.au/>, consulted 14/06/2022

ideology mineral resources are shaped in in Greenland. This aspect is reinforced by the presentation we can read on the screenshot “The Ivittuut Project is the world’s largest and only known source of naturally occurring cryolite”, integrating Greenland into a global political scene that pulls away the Danish-Greenlandic relationship. Finally, the company’s communication on Ivittuut highlights uranium values in the ground, emphasizing that they are well below the limit set by law.

Ivittuut’s case shows very interestingly a move from the legal and political scene to create the picture of a REE project integrated among the community and the country, even if uranium is part of the deposits. It convinces that now, those grounds are manageable by Greenland.

## **Conclusion**

In Greenland, tracing the history of radioactive minerals’ political and technical surroundings leads to the history of decolonization and economical emancipation. It shows two kinds of association that weight on mineral resources, and seem to act nowadays on the way in which REE are developed. First, uranium is linked to the history of colonization and considered as a nuclear object among population and politics (as shown by the limiting law of December 2021). In mining context, industrialists have to deal with it become it is intertwined with REE. They use various strategies : erasing its occurrence, lowering it down, disguising it by enlightening another features of the deposit. Second, because of their historical and geological settings, radioactive minerals belong to the « frontier area » established by Greenlandic authorities since the 90s. Uranium’s position is now an absolute non-exploitation one, and its background occurrence is the only one recognized. On the contrary, REE’s position is a work in progress. This process has the characteristics of leaning on the legal frame of uranium and of composing a new ideology around radioactive minerals. At an international level, it relies on the ideas of peacefulness and helpfulness that respond to the global mineral need of the energy transition. This picture places Greenland at the center of the geopolitical scene as being a land of resources, and as being a strong national producer. Inside the borders, this ideology could adopt the path chosen by the industrialists of the creation of a sense of continuity between different resources and periods of time. This hypothesis is supported by the analogy of the 90s, when the Greenlandic Government established the « frontier area » strategy by officially making minerals part of a chosen national culture. That is to say, minerals where already part of Greenlandic relationships to the environment, but mining policies of that time integrated them to the nationalist ideology that was strengthening around independence negotiations. Then, the next question points to the position of REE in the current political and industrial development of Greenland. How REE are gonna be integrated into this national ideology, and what effect will it produce?