

EUROPEAN ENERGY REVIEW

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TOP STORY

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NO INDIAN SUMMER

By Ben Warner - editor-in-chief

October brought us a variety of subjects. The publication of the fifth report of the UN Panel for Climate Change did not – at all – attract attention. May be because the conclusions did not differ much from the former report. It was as though the world was busy with other more urgent topics, like the rather interesting developments in the LNG sector, as became clear during the World Energy Conference in South Korea. EER will pay attention to this in the coming weeks.

This Monthly places Greenland in the window.

In his article Reiner Gatermann offers a detailed insight into the richness of this giant island concerning rare and valuable minerals, that could make it a real treasure island. Paul Hockenos wrote that “ the once-mighty solar industry in Germany is straining to reinvent itself”, being one of the energy struggles in this country. The Belene nuclear power plant is a core subject in the actual Bulgarian energy policy, troubling the new socialist government, as Luka Orescovic points out. Especially in a time when the Bulgarian people are protesting against the price increases.

Billions of dollars per year can be the potential LNG export contributions to the US economic growth, but export approvals are very much in discussion and the game heads for a tiebreak, also by Luka.

The Utility Week in Amsterdam presented an avalanche of new developments both in the field of technology as well as in the ict-sector, all related to the magic word smart. Larger integrated systems encompass separated processes and subsets with the quality to anticipate risks and to provide security on the highest level. Cities

face a smart future, but also a big brother type of monitoring.

The shift of deadlines concerning targets on the road to a more sustainable energy world does not so much indicate a firm and consistent strategy or a self-organizing process. The year 2050 seems to be the new benchmark in the race against time. Ben Warner reasons that - as is the case- practice overrules (political) wishes.

The Greenlanders' future based on minerals, including uranium, and hydrocarbons



Normally, Greenland is not known for being a supplier of media headlines. The last few months, however, have been different, because of the announcement of major changes in the tax system concerning mining and offshore activities. At the same time large investments are necessary, but foreign investors are still hesitating, also because of the high costs. It is getting hot in Greenland.

| *By Reiner Gatermann*

The largest island on earth with a population of just under 57,000, got its first female Prime Minister, Aleqa Hammond. This alone did not result in long newspaper articles around the world, and neither did her call for independence from Denmark.

But Ms Hammond also said that her government will make major changes in the tax system for the mining and offshore industry, moving away from taxes alone to royalty plus tax; that the coalition intends to grant further offshore permits only “reluctantly”; that it will limit migrant labour “to an absolute

minimum”; and adjust the recently adopted Large Scale law for major mining projects. It was, however, the decision that “the zero-tolerance policy for minerals containing uranium will be abolished” which caught the most attention. This cannot be done without the consent of the Danish parliament. This coalition programme caused some anxiety among Danish politicians as well as – or perhaps even more – among the international mining and offshore industry, which over the last few years had enthusiastically been following the former Greenland government’s call for investments

in the island's supposedly "gigantic" mineral resources. Now it is rumoured that companies could contemplate the withdrawal from Greenland or - which was described as the least harsh scenario - freeze their investments. The incoming government was shocked by this hostile reaction and issued calming statements, saying mining companies in future will not to have to pay more tax than they do today. But there will be changes, according to Jens Erik Kirkegaard, the new Minister of Industry and Minerals. Other circumstances too have led to a relaxation of the earlier tensions: The international interest in Greenland's mineral and hydrocarbon resources has cooled down because of the drop in commodity prices, the failure of the first serious attempt to find hydrocarbons offshore, and the success of shale gas production in the USA. However, the Greenlanders can be assured, in a longer term their island will catch the interest of not only many companies but also governments and organisations. Especially minerals could play an important strategic role in the future. Because Greenland harbours a treasure.

For almost centuries, Greenland's richness in often rare and valuable minerals has been known. However, climate, technical obstacles, costs, lack of infrastructure and the constitutional and social structure of the island made the search for and exploitation of minerals over a long period of time unattractive and even undesirable. Greenland, Kalaallit Nunaart in Greenlandic, is with its 2.13 million square kilometres a third of the size of Australia, and has only just under 57,000 inhabitants, 16,500 of them living in the capital Nuuk. With 0.026 people per square kilometre, Greenland is one of the least populated territories in the world. About 80% of the island's surface is covered by ice up to 3,000 metres thick. The north-south extension of the island: 2,670 kilometres, the extension of the road network (2011) 369,999 kilometres, 74,060 of which in Nuuk. There is no direct road connection between towns or villages. In 1814, Greenland became a solely Danish colony which was almost totally isolated and on a rather low level self-sufficient until the end of the Second

World War. In 1953, Greenland became part of the Danish Realm, and in 1973 - through Denmark - member of the EU. In 1979, home rule was introduced and in 1985 Greenland became the first and up to now only territory to leave the EU. In June 2009, self-government was introduced. Only foreign affairs and

financially with DKK 3,439.6 million (461 million) a year. Furthermore, the Act determines: "Revenue from mineral resource activities in Greenland shall accrue to the Greenland Self-Government authorities." In the Danish Parliament (Folketing) a big majority voted in favour of the Act, just one party opposed it.

Now it is rumoured that companies could contemplate the withdrawal from Greenland or - which was described as the least harsh scenario - freeze their investments

national defence are still in the hands of the Danish government. The Self-Government Act stipulates: "The legislative power shall lie with Inatsisartut (Greenland Parliament), the executive power with Naalakkersuisut (Greenland Government) and the judicial power with the courts of law." At the same time, Denmark continues to support Greenland

From now on, according to the Act, the subsidy will be reduced by half the revenue exceeding DKK 75 million (10.1 million) per year. And should the subsidy be reduced to zero, negotiations will start between the Governments "regarding the future economic relations". Over the decades, quite a few mines have been opened - and closed. Along the coast

of Greenland, there is rarely a longer stretch of land without any minerals. Up to now, the most successful mine was the Black Angel in Maarmorilik, central West Greenland, about 500 kilometres north of the Arctic Circle. The zinc and lead mine, situated about 700 metres above sea level and only accessible by two aerial tramways, opened in 1973 and delivered with the exception of 1973 and 1985 until its closure in 1990 net profits of DKK 1,154 million in total. For a long time, Black Angel was regarded as the best zinc mine in Europe. The intention of the new owner, Black Angel Mining Ltd., which acquired the mine in 2003, was the reopening and extension of the mine. However, the parent company, the British Angel Mining Plc, is currently under administration and the prospects of future operations are at least under the present owner very bleak. The same applies to Angel Mining (Gold) A/S, another subsidiary of Angel Mining. In 2009, the company acquired the Nanulaq gold mine on the south coast of Greenland with the intention of an annual output of 24,000 ounces of gold. However, because of the downturn

of the gold price and the administration issues of the parent company, Nanulaq will – in the best case scenario – survive with a new owner. More likely is the closure of the mine. Another success story was the cryolite mine at Ivittuut in south west Greenland, the only one in the world. Between 1854 and 1987, the year it became uneconomical, it delivered 3.7 million tonnes of ore.

However, the Greenlanders, whose export revenues today originate to about 90% from shrimps and fish and to less than 10% from mineral resources, see their future precisely in the minerals and offshore industry. Over the last decade, Naalakkarsuisut has tried to attract foreign investments. It found most interest from Canada and Australia. However, Per Kalvig, Head of the Centre for Minerals and Raw Materials (MiMa) at the Geological Survey of Denmark and Greenland (Geus), is convinced: “Most of the projects will fail.” For 125 years, Geus has systematically surveyed and mapped the island’s mineral resources. The result is impressive. Along the almost 6,000 kilometres long coastline the experts

discovered mostly along the northern coast deposits of zinc and lead, and spread along the west, east and south coast deposits of copper, iron, nickel, gold, diamonds, platinum, titanium and many more.

And perhaps most important: the map

*Furthermore 72
exploration licences
have been issued*

shows eight deposits of Rare Earth Elements (REE) of which two, according to Geus, “may well be among the 10 largest REE deposits in the world”. Despite the fact that on principle Geus never provides commercial assessments of the finds, Per Kalvig describes the Ilimanssaq geological complex in the south of Greenland as a “super giant REE deposit”. This complex comprises Kvanefjeld and Kringlerne. Both fields are accessible around the year and close to an airport. Kvanefjeld, a multi-element deposit, offers an

additional attraction: the deposit contains uranium. However, Denmark is since the mid-eighties a signatory of the International Atomic Energy Agency international non-distribution agreement for uranium and insisted, up to now, that it stay this way. In Copenhagen there are signs of irritation, since Ms Hammond announced the intention of her government to abolish the zero-tolerance rule. Around Greenland Geus has found at least five uranium deposits. But Kvanefjeld is special: For geological reasons, without uranium production no production of REEs. The deposit is owned by the Australian company GMEL, and Kringlerne, also a multi-element deposit, by the likewise Australian company Tanbreez. According to Geus, Greenland “has the possibility to become a major exporter of rare earth elements”.

There is another find which the economic geologist Per Kalvig describes as “having potential”. It is situated in the far north, in the Citrone Fjord. This zinc deposit is similar in structure to two Canadian mines, and the Australian company Ironbark has been awarded an exploration

licence. The best way to transport the metal: Shipping through the North-East Passage.

Right now, Greenland's Bureau of Minerals and Petroleum (BMP) have awarded four exploitation licences for minerals and only one mine is in production. Furthermore 72 exploration licences have been issued. In about 10 years time, Per Kalvig sees five projects – “with a little bit of luck” - at an advanced stage. One of the major problems to be solved: financing.

After sporadic drillings back in the 1970s,

However, exploration and exploitation costs will be tremendous

in 2007 the Greenlanders seriously started their oil and gas adventure. But they are still waiting for the big hit. Despite awarding of 18 prospecting licenses for offshore activities, the companies are still

very hesitant to start drilling. With the exception of Cairn Energy. The Scottish company wanted to be the first under any circumstances.

The result of the eight holes, drilled 2010 and 2011 along the west coast: some traces of hydrocarbons, but no commercial discovery. Whilst all the major international and national players, with the exception of BP, have registered their interest and were even awarded some exploration licences, for the next few years no one has yet announced any plans for the drilling of new wells. Again, with the exception of Cairn Energy. The company announced in its Half-Yearly Report of August 2013: “Joint Venture decision in H2 2013 on an operated exploration well offshore Greenland (H2, 2014)”. It has yet to be seen whether Cairn finds a partner.

Another obstacle Cairn and all the other interested parties are facing is the new government-coalition's decision to – at least for the time being – stop the awarding of new licences. Prime Minister Aleqa Hammond argues that today, “the rescue services in Greenland

are not as good as we wish them to be”. Furthermore, she will give today's licence holders enough time to carry out their mandate. And finally: “We should also listen to the opinion of the industry, the people and the NGOs.”

However, one project will go ahead undisturbed. In the beginning of the 1990s, Exxon/Mobil, BP, Japan National Oil Company, Shell, Statoil, Chevron/Texaco and Nunoil established the Kanumas Consortium for collecting seismic data from Greenland's far north. Now, the group is concentrating its efforts on the Greenland Sea and is applying exclusively for 11 blocks as a share of a total of 19 blocks covering an area of 50,000 square kilometres. The BMP received applications from three bidding groups. A decision is expected soon. In January 2014, the Government will announce the successful bidders for the rest of the area, which is also open to none Kanumas-companies.

Looking at a map of Greenland and reading the U.S. Geological Survey's (USGS) Circum-Arctic Resource Appraisal of undiscovered Oil and Gas North of

the Arctic Circle it does not come as a surprise that the island attracts a lot of interest from the petroleum industry. According to USGS, alone the sea along the East Greenland coast harbours more than 31 billion barrels of oil equivalents and the mean estimate for the whole of the island lies above 50 billion. USGS includes Greenland into the five most attractive Arctic provinces where “more than 70% of the mean undiscovered oil resources are estimated to occur”. However, exploration and exploitation costs will be tremendous. And – first of all – nature will even in the future not be friendly to the industry. Some experts are making the point that in the future it will perhaps be easier and less expensive to produce oil and gas in the by then for a relatively long time of the year open Arctic waters than around Greenland, and here especially the east coast. ■

Greenland's aspirations: a challenge to Denmark

In this second part of our Greenland coverage Reiner Gatermann takes a closer look at Greenland's aspirations to exploit the island's mineral and petroleum wealth. Should the Greenlanders succeed in getting the hoped-for results, they would still have to take high hurdles to realize constitutional and economic independence. This is not impossible, but it will be difficult. Some Danes – and a few Greenlanders - even call it unrealistic. One important hurdle was taken last week: with a majority of one vote the Greenlandic Parliament Inatsisartut voted for the abolition of the zero-tolerance rule for mining and export of uranium.

| *By Reiner Gatermann*



Greenland and Denmark (c) Wikipedia

Most of the 57,000 Greenlanders with Aleqa Hammond at the helm are counting on the revenues from minerals and petroleum to finance their future independence. Looking at Norway, Greenland has already established a state-owned mineral and petroleum company, Nunaoil, which is automatically granted a share in all licences. In the offshore sector it varies between 8 and 12.5 percent. As in the Norwegian system, Greenland has established a fund to collect and administrate the state's profits from minerals and petroleum. But up to now it has not collected a single dollar.

Aleqa Hammond, who was born in 1965, calls independence a vision. Hammond herself is not sure whether she will see the day of a totally autonomous Greenland. There are two aspects: the constitutional one, as Greenland would have to leave the Kingdom of Denmark (Rigsfællesskab) or find a different place within it. This is for the Greenlanders to decide. Denmark is not expected to reject the islanders' vote. Another aspect is even more important. Minik Rosing, a Greenlander himself, Cox Visiting Professor of Stanford University and Chair of the newly by the Universities of Copenhagen and Greenland appointed Group of Experts, tells EER: "Independence based on minerals is the wrong way to go." And Lars Bangert Struwe, Research Fellow at the University of Copenhagen and a Greenland expert,

points to another aspect: "Independence tomorrow, including security and defence, is economically impossible." The Greenlanders are divided on this issue. Perhaps even the Prime Minister is aware of the difficulties her vision presents. Tove Søvn Dahl Gant, Greenland's Representative in Copenhagen, tries to explain: "Of course we are looking at different solutions, for example at the United States of America or at the relationship between the Cook Islands and New Zealand."

Two issues have dominated the debate: the abolition of the zero-tolerance ban on mining and export of uranium, and what role China will play in Greenland's future

Denmark partly in driver's seat
Ever since presenting the coalition programme of the social democratic party Siumut, the social liberal party Atassut that promotes good relations with Denmark, and the newly-founded Partii Inuit with strong nationalist and socialist

tendencies, two issues have dominated the debate: the abolition of the zero-tolerance ban on mining and export of uranium, and what role China will play in Greenland's future. In the preliminary talks within the government for last week's vote in parliament, the Prime Minister faced a sudden problem. Partii Inuit, which only has one seat, declared its resistance to the abolition. Aleqa Hammond had no alternative but to ask Partii Inuti to leave the coalition.

Doris Jakobsen (Siumut), one of two Greenland members of the Danish Parliament (Folketing), tells EER: "I do not see extraction and export of uranium as a problem as long as it is done safely and the materials are solely used for civilian purposes. When those conditions are fulfilled I see no difference between radioactive and other minerals. That is why I support lifting the zero-tolerance ban." Both Greenland and Copenhagen recommend taking a closer look at Canada and Australia as uranium-exporting countries. However, Greenland needs the support of the Danish government: only Copenhagen can apply for a change in the

international IAEA-convention that was signed and ratified by Denmark in 1988. The convention prohibits the production and export of uranium.

After last week's 15 to 14 vote in favour of abolition, the Danish daily newspaper "Berlingske Tidende" writes: "If one looks at the recent troubles in Greenland's political life, one can have doubts, whether this decision is final." The opposition had asked for a postponement of the vote until a referendum has taken place. Whilst Aleqa Hammond repeated her view that Greenland's minerals, inclusive uranium, are an issue exclusively for the islanders to decide, in Copenhagen the Danish People's Party (DF) asked Greenland's Prime Minister to admit as soon as possible that the uranium issue is a matter for the Danish government. DF is the only party which voted against the self-government act. The party's speaker on Greenland affairs, Søren Espersen, warned that this issue could take up to twelve years to be decided in court. Recently, a Danish-Greenlandic working group in the Foreign Ministry stipulated that uranium is a radio-active mineral and

therefore a foreign affairs and security issue. Nuuk responded: "Denmark has no right to decide on Greenland's minerals."

China's interest

Perhaps more complex is the role that Greenland and Denmark are prepared to give China in the island's business. The London Mining Greenland A/S is licence holder for Isua, what is supposed to become Greenland's largest mine by far. It has offered a Chinese bank a share in this adventure. To exploit this iron deposit, about 2,000 workers would be needed

promoting foreign investments in Greenland while preventing and limiting negative consequences for the national economy and the competitiveness of the business sector as a result of an influx of foreign enterprises into Greenland.

The so-called Large Scale Projects Bill will only apply during the construction of a large-scale project in the mineral and hydropower industry, which must have a capital expenditure of more than DKK 5 billion (670 million euros) while the technical and financial demands must exceed what is available

"For the USA and Europe, REE are not a commercial product but a strategic mineral"

throughout the construction phase. China would supply them in addition to a major financial contribution. This immediately started a hefty debate. The main point: the import of cheap labour. In December 2012, the Greenland Parliament (Inatsisartut) passed a bill

to the company in Greenland. Wage and employment terms must be "acceptable and objectively fair and reasonable". In its coalition agreement the new Government announced the re-evaluation of the Large Scale Law. Whatever the outcome, for different reasons, China

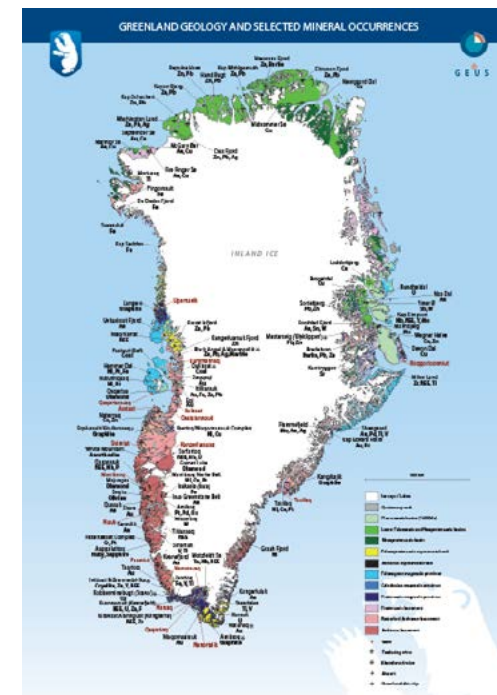
cannot and should not be prevented from doing business in Greenland. Up to now the Inatsisartut promoted Chinese investments and attended fairs in China. Minik Rosing supports the islanders and says: “That could be a good thing”, depending on how things are done. He points at Canada, which has been successful in attracting and controlling Chinese investments. And he does not fear, as some politicians in Copenhagen and Nuuk do, a Chinese monopoly on Greenland’s minerals, because, according to Per Kalvig, on REE, China already has the monopoly on technology.

At the edge of the debate there are sometimes voices who point at the strategic aspects of this issue. Lars Bangert Struwe: “For the USA and Europe, REE are not a commercial product but a strategic mineral.” Therefore, he is surprised by the disinterest shown by the Americans, who during the Cold War had a strong military base for B-52 bombers and missiles in Thule. Even today, the US keep a military presence. Bangert Struw registers a much stronger interest from Europe.

With the new government Minik Rosing

sees a change of rhetoric, a stronger will for independence and less willingness to cooperate with Denmark. According to Lars Bangert Struwe, Greenland, Denmark and the Kingdom of Denmark have “much to win and all to lose” as a result of this mineral adventure. If there is no common agreement, “in a few years’ time we will end up in a situation where the formal Greenland dependence on Denmark will be replaced by an informal economic dependence on one international company.” In the future there may be tensions between Nuuk and Copenhagen, and perhaps the Danes are getting more impatient with Greenland’s demands and expectations. According to Lars Bangert Struwe, “today quite a few Danish politicians would like to rewrite the Self-Government Act, because the Greenlanders got too much too cheap.” However, in general, no one is expecting a major upheaval between Greenland and Denmark. Even though Nauja Bianco, Greenlander and senior advisor Northern Europe at the Danish Ministry of Foreign Affairs, sees “a danger for the Kingdom of Denmark” in the zero-tolerance

issue. In the end, however, she describes the Danish-Greenlandic relationship “familylike and pragmatic”, and no-one is looking for a break-up. ■



Greenland Geology and selected mineral occurrences - [download pdf](#)

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National markets

17/10 Bulgaria rethinks energy policy

The political ties between Russia and Bulgaria run deep. During Soviet times, Bulgaria was one of Russia's closest political allies. This important place of Russian influence in Bulgarian politics persists today as each government seeks to (re)define its relationship with the Kremlin. The transition into democracy in 1989 significantly reshaped relations between the two countries as Bulgaria pursued a new western course, joining the NATO in 2004 and the European Union in 2007. On the surface, this substantial rapprochement with 'the West' reduced Russia's influence over the 7,3 million population of this Balkan country. Yet in energy policy ties still run deep. [Read the full story →](#)

24/10 US LNG Exports: A regulated affair

To indicate the magnitude of the US shale gas revolution's impact on the country more than one commentator has pointed to the refitting of LNG import terminals as export facilities. In reality however, the anticipated US LNG export renaissance has to date been a modest affair. Despite US gas producers lobbying for the continuation of LNG export licensing as European and Asian gas prices reach multiples of US price levels, fears about the impact of US LNG exports on domestic pricing has kept the US Department of Energy (DOE) from issuing any exporting licenses since May of 2011. [Read the full story →](#)

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Renewable energy

14/10 Germany's PV branch: from boom to bust and back again?

Not all so long ago, Germany's PV industry was the precocious star of Germany's manufacturing sector. At the height of the eurocrisis, it shone brightly. Installed capacity in Germany shot up from 2.9 GW in 2006 to 32.6 GW in 2012, the lion's share of it made in Germany. Much of the new industry was located in eastern Germany, picking up its beleaguered regions after decades of stagnation. The Wunderkinder of the branch - firms like SolarWorld, Q-Cells, Solan, Aleo Solar and Conenergy - dominated the European market and exported German hardware and technology around the world. But the tables have turned. [Read the full story →](#)

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Alternatives & Innovation



22/10 Super-umbrellas covering smart cities

In most cases new applications and innovations are the result of developments within a certain industry. Specialized companies have their own laboratories and research departments, or they collaborate with universities. Their findings mainly flourish within a particular field. Other discoveries find their way to a whole range of applications outside the industry they were originally designed for. Smart appliances in the energy sector illustrate both ways to the market. [Read the full story →](#)

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Energy perspectives

03/10

Benchmarks: part of nature, part of us

Human psychology being what it is, we're happiest when working to a clear timetable. So it is that we set deadlines. In the case of longer term deadlines, we tend to embrace decimals: a ten-year plan, for example. But such deadlines have no direct bearing on the real world around us. The same goes for the EU's 20% sustainability targets: they are not underpinned by scientific research, nor do they relate to the end goals that have more or less been mapped out. Now the year 2020 looks to be losing its appeal in several member states because the targets no longer seem attainable, new deadlines are being set in the 2030 and 2050. But what is the actual challenge we are facing? [Read the full story →](#)

10/10

Natural gas brings flexibility to the mix

Thanks to the Slovak gas magazine Slovgas, we are able to bring you an eye-opening interview with Georges Liens, Chairman of the Coordination Committee of the International Gas Union (IGU). Liens evaluates the current standing of natural gas and gives his views on its future position. He shares with us his opinion on the priorities of the French Triennium, what has been causing the imbalance in the European gas market over the past ten years, where we are standing in the energy transition process, how long-term contracts should be modified and what the connection is between underground gas storage and shale gas. [Read the full story →](#)

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EU Energy Policy

28/10 The Greenlanders' future based on minerals, including uranium, and hydrocarbons
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