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## **Global Warming<sup>1</sup> - Challenges and Opportunities in the High North**

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<sup>1</sup> Based on Valsson, Trausti, 2006, *How the World will Change – with Global Warming*, Reykjavík, 2006, [www.howtheworldwillchange.com](http://www.howtheworldwillchange.com).

# Global Warming<sup>2</sup>- Challenges and Opportunities in the High North

## Introduction

The book *How the World will Change – with Global Warming* presents my vision as a planner of what the changes in our climate and nature will lead to as in respect of human settlement. It presents an overview of the likely impacts on the local/regional scale, where several adaptation measures can be adopted, as well as those global changes where relocation and migration are functional strategies. This debate article builds on material from the book and begins by sketching an overall global picture. It then focuses in on what the Arctic will look like in the latter half of this century and it finally outlines what the impacts of these changes will be on the Nordic countries. The focus here is on the opportunities created by these changes. The various challenges, not least in terms of planning and environmental protection, are not however overlooked.

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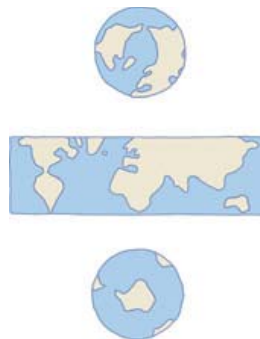
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## **An overall picture**

Cartographically, the world is most often represented by a kind of ribbon map showing only the middle of the globe, and not its polar areas. By means of various technological advances as well as the onset of global warming, the edge of this habitable ribbon is spreading north into the Arctic. By 2050 most of the Polar ice around the Arctic Ocean will probably have disappeared in the summer months. Access will thus be granted, via ice-free rivers, to the huge store of resources of the Arctic rim and on into the vast spaces of Siberia, Northern Canada and Alaska.

If the warming continues into the 22<sup>nd</sup> century, many of the central areas of the globe will become uninhabitable. This would mean that the world structure of the future would primarily be that of the semi-globe of the northern hemisphere with the Arctic – which today is the periphery – will be at the centre. Prophetically this world structure, which will unite the world over the Arctic, was chosen to become the logo of the United Nations sixty years ago. Today, economic activity is mostly limited to the above-mentioned ribbon around the world that we know from the flat world map. On such a map the High North is an outer fringe which stretches along the map's upper edge. This map gives however provides a highly distorted picture of the spatial realities of the globe and belies the fact that all northern areas come together in the Arctic, with the main land mass areas of the globe, circling around it.



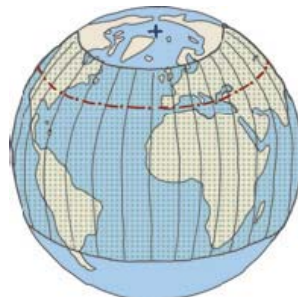
*Figure 1:* Today's ribbon map of the world only shows the middle of the globe. It does not show the polar areas, presented here as two separate circular pictures.

The next picture shows the High North areas of the globe – not viewed directly from above but rather more from the European side. In this way the Arctic and most of the land mass of the Earth can be shown in one, un-distorted, global picture.



*Figure 2:* Arctic and sub-Arctic areas, grey on the map, are currently unsuitable for mass habitation. Global warming and the reduction of the sea ice will make them more and important for future development on Earth.

During the next 50 years or so the Arctic will be influenced by global warming, the subsequent interconnection of the areas and oceans of the Northern Hemisphere will start to take off. This, together with a gradual spreading of people and bio- and climate zones north, will mean the start of an epoch in which the shift from the spatial system of the ribbon to the spatial system of the semi-globe will take place. This shift will be very dramatic because the Arctic, which today is the area furthest from the system of the ribbon, will become the very centre of the semi-global system of the Northern Hemisphere. This will lead to a new world structure with the Arctic at its centre. The following two figures show, graphically, the spatial systems of the ribbon and the semi-sphere.



*Figure 3:* Today's worldview is that of the ribbon, but the influence of the spatial characteristics of the sphere is becoming ever stronger.



*Figure 4:* The move from the ribbon world to the global world will not be completed because the semi-global world - illustrated above - will take over.

The Arctic is not accounted for in today's ribbon view of the world. The main reason for this is that it has been covered by snow and ice. After the political thawing of the Cold War and as the thawing of the Arctic pack ice had started because of global warming, the eight Arctic countries: The USA, Russia, Canada and the five *Norden* states, began cooperation, founding the *Arctic Council* in 1996. In the last few years it has become ever more apparent that the polar ice is melting much faster than originally envisaged. This melting process opens up the Arctic Ocean floor, and the Arctic rim more generally, for the exploitation of the immense resources located there. It is, however, not only global warming and the enormous natural resources that will make the Arctic regions very important in the world of the future. It is also its central location in the land mass of the Earth and the short, direct sea routes to the main population centres of the globe in the North Atlantic and North Pacific spaces.

The Arctic has not previously enjoyed the benefits of short distance linkages because of the sea ice covering most of the Arctic Ocean. The Arctic sea ice is now however retreating fast and by 2040 easy access will be available to the resources of the Arctic while the sea routes between the North Atlantic and North Pacific spaces will be navigable the whole year round with specially built ships. Large transshipment harbours will be needed at both ends of the Arctic shipping lanes, both at the Bering Strait and at the gates in to the Atlantic between Greenland, Iceland, Norway and the UK. The following picture shows the main Arctic sea routes of the future – and the location of two possible transshipment harbours (the circles).



*Figure 4:* Once, by the late 21<sup>st</sup> century, most of the sea ice has disappeared, the shipping lanes will become a catalyst for still stronger development in the High North.

Where traffic goes areas thrive, but in areas of little transportation not much happens. The main reason why Greenland, Iceland and Northern Scandinavia did not thrive in previous times was not so much the cold but rather their location on the edge of the navigable area of the world. This changed dramatically with the advent of the steam ships, and the High North became a part of the inhabitable world. As the Polar ice is now retreating fast and better ships and remote sensing are being developed, transportation, and thus the habitable edge of the world, is moving ever further into the Arctic. The final stage of this development will be seen as the whole Arctic Ocean becomes navigable, and as all-year round sea route connections between the Atlantic and Pacific Oceans become a reality. This will mean greatly increased activity along the Arctic sea routes, and very vigorous economic activity in many areas of the Arctic, because “where traffic goes, areas thrive”.

The way the Arctic sea ice retreats directs the way in which the sea routes develop. Because of the Gulf Current the Barents Sea bordering Northern Norway and Northwest Siberia will be first to become ice free, and the snow cover there on land is thus also retreating fast. This will be of benefit to, for instance, land- and railway transportation in these areas. New plans for a railway transportation corridor from China, where Narvik was chosen to become its Atlantic port, are already being developed. (See picture below).



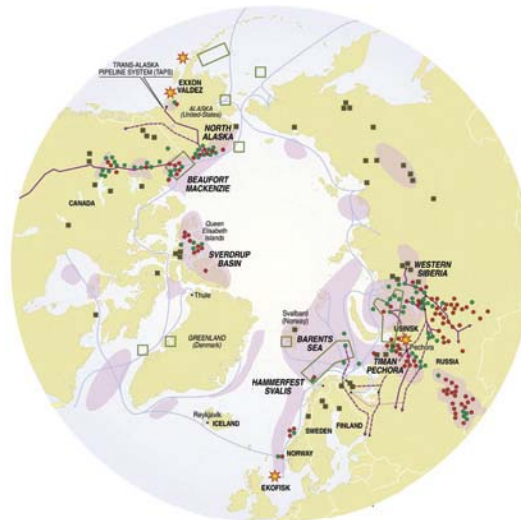
Figure 5: A new and improved Siberian railway project to connect the South-East Asian and North Atlantic markets is now underway with Narvik scheduled as its Atlantic port.

The ever increasing size of container ships leads to the growing importance of transshipment harbours. These harbours need not be hubs of land transportation because it is mostly feeder ships that distribute the containers to other harbours. Large, safe harbours with enough inexpensive flat land are needed – which might be a problem in Narvik. Reydarfjörður is the best harbour for a transshipment hub in Iceland. While the Arctic ice cover holds the Arctic sea route close to Siberia and Northern Norway, a harbour in Reydarfjörður is sub-optimal for Europe – but Reydarfjörður is already directly *en route* to Northern America. Once the ships start to go over the North Pole Reydarfjörður becomes the perfect location, because then it is in a spot where the routes between Europe, America and the Pacific come together. Today a large transshipment harbour is being planned in the old military harbour of Scapa Flow in the Orkney Islands. This harbour is planned to serve transportation between Europe and America but it could also later serve as a hub for transportation to and from the Arctic. All these harbours: Narvik, Reydarfjörður and Scapa Flow, together with Murmansk on the Kola Peninsula, could become important transshipment harbours for Arctic shipping, and would enhance regional development in their area, accordingly.

The three main types of resource development in the High North are *oil/gas*, *agriculture* and *fishing*. We will deal with fishing and agriculture first. In general, it can be said that with the increased warming of the North, the productivity of all of its life systems will increase. A crucial fact here is that more precipitation will occur in the Arctic as it gets warmer, contrary to what will happen in many southern areas. With warming, vegetation in the North will actually become more "southern". Therefore the area will yield more and more valuable agricultural products in the future.

The increased warmth of the Arctic Ocean and the growing amount of nutrients that will be discharged by the increasingly ice-free Arctic rivers mean that the Arctic Ocean will take a giant stride forward in terms of marine productivity. Some of the potentially available fishing grounds are currently closed off due to the position of the Arctic sea ice, but as warming continues, the sea ice will continue to retreat.

The fact that large areas of the Arctic Ocean are shallow means, in addition to the retreating sea ice, that more sunlight can reach the bottom and make it a fertile ground for fish and other marine organisms. As fishing preferably needs to be a year round activity to reach maximum profitability, this higher productivity level will not be gained until the sea ice has disappeared in the wintertime also. Maps that show the best agricultural areas in the High North are not available. Such maps are needed so that planners can estimate where the main centres of these activities will be in the future. As regards fishing, it is clear that islands have an advantage as when comes to being centres for fishing because from there the radius of reach covers such a wide ocean area. As fishing stocks spread north, Jan Mayen and Svalbard will become important fishing islands. Let us now look at a map where the most important oil/gas resources are located.



*Figure 6:* The lilac coloured areas are prospective sites for oil and gas. Today's oil spots are green while the gas spots are red. Currently, most of this type of activity is taking place in North-western Siberia, in the Barents Sea, in the Mackenzie Valley in Canada and in the Alaskan North Slope.

In the near future most new oil/gas activity will occur in Northern Norway, in the Hammerfest-Svalis area and in Svalbard. Oil finds have also been confirmed off Jan Mayen, the Faeroe Islands and off the west coast of Greenland. It is however unlikely that many people would want to move their residence to these dark areas until the climate has become

considerably warmer. The workers would therefore mostly live elsewhere, and go north for intensive work stints, as with the workers on the oil platforms today. The economic and regional importance of these activities will, in spite of this, be great.

## Disputes in the Arctic

There are four main fields of unresolved disputes in the Arctic: a) Sovereign rights pertaining to the regulation of fisheries, b) Where are the northernmost extensions of the continental shelves in the Arctic, i.e. outside the 200 miles Economic Zones?, c) Delimitation lines between coastal states, d) Rights and rules in respect of international shipping. Politicians and their general publics are finally realizing, and accepting, that the globe is getting warmer. What arouses their interest is that the enormous areas of, and resources contained within, the High North are opening up because of the retreat of the Polar ice sheet. Rights to fishing and rules in international shipping are also bones of contention. Of late the world news has been filled with reports of actions where nations are trying to demonstrate the seriousness of their claims. In July 2006 Canada's PM Stephen Harper announced that Canada was ordering up to eight military icebreaker patrol ships and planning to build a naval base, for 3.5 billion Pounds Sterling. Harper noted, "Canada has a choice when it comes to defending our sovereignty over the Arctic. We either use it or lose it. And make no mistake this government intends to use it." Also in July the Russians announced that an Arctic research expedition had proven that the Lomonosov Ridge continues from the Siberian continental shelf all the way to the North Pole. In accordance with international law they subsequently claimed an area outside their 200 miles EEZ, all the way to the North Pole. (See the map).



*Figure 7:* Russian claims in the Arctic. The colour brown shows the Lomonosov Ridge (no. 1.2.3) and grey hatched area the deep sea-bed claims outside their EEZ as well as a disputed area in the Barents Sea, at the uncertain delimitation line with Norway (both no. 4).

Russia's deep sea-bed claims beyond its EEZ (no. 4 on the map) amount to some 1.2 million km<sup>2</sup> (which is about 12 times the size of Iceland). In early August the Russians announced that they had used two submarines to place the Russian flag on the ocean floor, at a depth of 4 km, under the North Pole, to confirm their claim. The Danes, on behalf of Greenland, this summer, also sent a research team into the Arctic, with the Swedish icebreaker *Odin*. The main mission was to collect data supporting the notion that a ridge also extends to the North Pole from Greenland. These are only two examples of the actions and research programmes

currently underway on the behalf of the eight Arctic nations in support of their rights and claims in the Arctic. In the history of land and ocean reclamation, the large, powerful nations always have an advantage. They can for instance threaten, influence, patrol, do research and establish 'presence'. The five small *Norden* states (total population 27 million) need therefore to join together and to form a *task force* within the *Nordic Council of Ministers*, to create policy on how they can unite their strengths in the various battles for rights in the Arctic that are now taking place. In order to strengthen their unity they need as the first order of business, to resolve all unfinished disputes between themselves in the Arctic, as soon as possible.

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