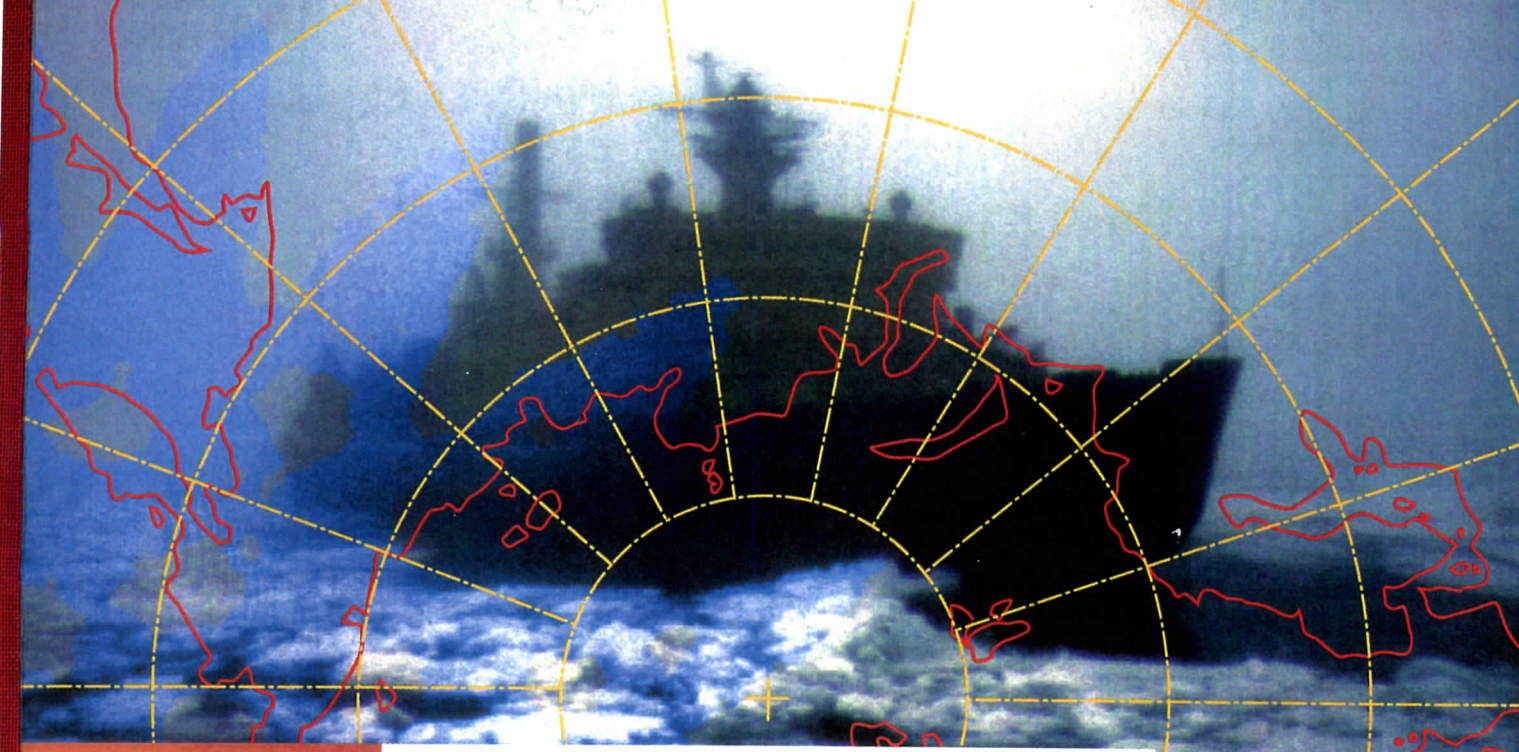

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Selected Issues on Regional Economic Development along the Northern Sea Route

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Sub-programme III: Trade and Commercial Shipping Aspects.

Project III.02.3: Selected Issues on Regional Economic Development along the Northern Sea Route.

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FOREWORD - INSROP WORKING PAPER

INSROP is a five-year multidisciplinary and multilateral research programme, the main phase of which commenced in June 1993. The three principal cooperating partners are **Central Marine Research & Design Institute (CNIIMF)**, St. Petersburg, Russia; **Ship and Ocean Foundation (SOF)**, Tokyo, Japan; and **Fridtjof Nansen Institute (FNI)**, Lysaker, Norway. The INSROP Secretariat is shared between CNIIMF and FNI and is located at FNI.

INSROP is split into four main projects: 1) Natural Conditions and Ice Navigation; 2) Environmental Factors; 3) Trade and Commercial Shipping Aspects of the NSR; and 4) Political, Legal and Strategic Factors. The aim of INSROP is to build up a knowledge base adequate to provide a foundation for long-term planning and decision-making by state agencies as well as private companies etc., for purposes of promoting rational decisionmaking concerning the use of the Northern Sea Route for transit and regional development.

INSROP is a direct result of the normalization of the international situation and the Murmansk initiatives of the former Soviet Union in 1987, when the readiness of the USSR to open the NSR for international shipping was officially declared. The Murmansk Initiatives enabled the continuation, expansion and intensification of traditional collaboration between the states in the Arctic, including safety and efficiency of shipping. Russia, being the successor state to the USSR, supports the Murmansk Initiatives. The initiatives stimulated contact and cooperation between CNIIMF and FNI in 1988 and resulted in a pilot study of the NSR in 1991. In 1992 SOF entered INSROP as a third partner on an equal basis with CNIIMF and FNI.

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INTRODUCTION

This report is a continuation of a joint research project under the INSROP umbrella "Trade and commercial shipping aspects". The sub-programme, to which this report belongs, is called "III.02.1-2, The Northern Sea Route and possible regional consequences".

The first phase of the sub-programme was carried out in 1994 as Part Project III.02.1. The results are summarised in the report "The Northern Sea Route and possible regional consequences". The present report contains the results from Part Project III.02.2. Here we follow up the industrial analysis for oil and gas, forestry and wood processing, and fisheries, which was started in Part Project III.02.1.

Co-operating institutions are ACTA Consult, FINNUT and NORUT Social Science Research. Except from the initial phase of Part Project III.02.1, in which the framework of the project was discussed, the institutions have been working relatively separately. This is especially true for the industrial analysis. ACTA has carried out the research work on forestry and wood processing, FINNUT has covered oil and gas, and in the first project-report also minerals, and NORUT has looked into the fishery sector.

As the organisation of the work on the different industries has varied largely, and the conclusions drawn are not easily comparable, there is no joint conclusion at the end of this report. Though there are some conclusions in each of the three analyses, there are several questions which have not been possible to answer. This is partly due to restricted resources, partly because the project was not intended to deal with such questions, and is partly a consequence of the highly uncertain conditions in the Russian part of the analysis-region. Further supplements to some of the analysis should thus be both interesting and relevant.

If INSROP is continued beyond 1996, the results of the two reports on Part Project III.02.1-2 should give a good basis for further research on regional consequence-analysis. If it is terminated, the results throw light on some issues concerning regional consequences of the realisation of the Northern Sea Route.

Export of fish products from Norway to countries in the Far East

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CONTENTS

1 BACKGROUND AND LIMITATIONS

1.1 Limitations

In the preceding report of this project our main concern has been the demand for species such as mackerel, salmon and herring in countries in the Far East[1], and the corresponding export of these species from Norway. The main objective has been to state the extent of -, and development of export of the mentioned species from Norway to Japan and other Far East countries, and analyse future development of this export. Our findings regarding whether the Northern Sea Route (NSR) is relevant for transportation of fish from Norway to the Far East has been based on the views of Norwegian fish exporters. The chosen approach implies that none of the involved actors are situated along the NSR. Due to limited resources, we have chosen a well-established and significant trade which can be of interest for the NSR as a point of departure. We have deliberately decided not to include other North-European fish-exporting countries, such as Denmark, Iceland and Greenland in the analysis, though it is clearly relevant. Further, we have argumented that it is not likely that the fish-industry in Northwest-Russia will be competitive exporters of fish products to the Far East[2].

Finally, within the framework of the project, data and knowledge on transportation-technical matters have been impossible to gather. This implies that we have not made any thorough investigation into the question of whether transportation along the NSR for mere technical reasons is suitable for fish products.

1.2 Background

The Far East is a promising market, which already imports fish from Norway. Japan, for instance, in 1994 imported about 210,000 tons of fish products from Norway (Norwegian Seafood Export Council 1994). The export of processed fish from Northwest Russia, on the other hand, is quite small and basically oriented towards markets in Western Europe (Høifødt, Nygaard and Aanesen 1995, Hønneland and Agustsson 1995). In the subsequent analysis of the potential of the NSR for transportation of fish products from Northwest Europe to the Far East, we have therefore left out the Russian part and concentrated our efforts on the North Norwegian fisheries. The main reason for this priority is the fact that

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[1] China, Hong Kong, Japan, the Philippines, Singapore, South Korea and Taiwan

[2] The reviewer has made objections to the tenability of these arguments, and has also pointed out that they will only be relevant in short- and medium term prospects (defined as shorter than 10 years).

the Northwest Russian fisheries, as mentioned, so far have exported only marginal quantities of their total catches as processed products. Furthermore, the prospects for an extensive export of processed fish from Northwest Russia in the foreseeable future are slim.

A recent report on transportation of fish in the Barents Region (Agustsson and Hønneland 1995) concludes that the Northwest Russian fisheries in all likelihood will continue to export the bulk of their white fish catches to Norwegian processing plants in an unprocessed state. A certain - and possibly growing - amount of the total catches will be transported as frozen goods by the vessels directly to Western European ports, whereas only a marginal amount of processed fish products will be exported from Northwest Russia. An additional argument for such an allegation is the fact that the on-shore fish processing industry in Murmansk is in a poor condition and barely capable of producing fish products which meet the quality demands of the Western market. Even if Western companies would invest in the Northwest Russian processing industry, considerable amounts of the total catch would still have to be delivered to Norwegian plants in an unprocessed state as some important shipowners have obliged themselves to such an arrangement in order to finance the building of new fishing vessels in Norway. An example is the agreement between Norway Seafood/Resource Group International and a large Russian actor on the building of 16 trawlers. Before these vessels are transferred to the Russian owner, it is obliged to deliver a total of 70.000 tons of cod to Norwegian fish receivers (Agustsson and Hønneland 1995).

Pelagic species, on the other hand, will most likely continue to be sold on the Russian home market due to the obligations of fishery management authorities to meet the nutritional needs of the population, apart from these products barely being suitable for export to the Western or Far Eastern markets.

Furthermore, the bulk of the actual export of processed fish will probably be directed to the Western European market since, as pointed out in the preceding report of this project, extensive fishing is already taking place in the Northeastern part of Russia, and Russian export of fish to other countries in the Far East will most likely come from this fishery. On account of these general traits in the fishing industry of Northwest Russia and Northern Norway respectively, we have chosen to concentrate on the latter in an attempt to assess the transportation potential of the NSR in the export of fish products from Norway to the Far East.

2 THE MARKETS FOR FISH IN THE FAR EAST

Generally speaking, the markets for fish in the Far East are characterised by a large population and a growing wealth along with consumption habits which favour fish. As far as export of fish products from Norway to the Far East is concerned, Japan is by far the most important single market. Markets in South-East Asia are, however, expected to become increasingly important for Norway in years to come. Countries such as South Korea, Hong Kong, Singapore, Thailand, Taiwan, The Philippines, Malaysia and China import fish from Norway, and particularly China will be the object of intensive marketing of Norwegian seafood products in the immediate future.

2.1 Japan

In Japan, 125 million people annually consume 9 million tons of seafood, which amounts to 72 kg per capita. Fish and other seafood products enjoy a high status, and the market has a considerable purchasing power. Until 1970, the country was more than self sufficient in seafood (Olsen 1995). The rate of self sufficiency has, however, experienced a dramatic decrease since 1980, as shown in table 2.1.

Table 2.1 Japan`s self-sufficiency in marine products

Year	Self-sufficiency in %	Import of marine products
1980	80	1 mill tons
1990	60	n.a.
1994	50	3.3 mill tons

Source: Olsen 1995

The reduction was partly due to a more than 20% increase in consumption in the period, but mainly a result of reduced domestic production of seafood. The Japanese import of marine products has more than tripled, from approximately 1,000,000 tons in 1980 to some 3,300,000 tons in 1994. The bulk of these products was imported as frozen fish. The most important single species were shrimps with 23% of the total import, tuna with 11% and salmon with 8% (Olsen 1995).

As to export of seafood from Norway to Japan, the export value has increased tenfold in about a decade. Its value has grown from NOK 500 million in 1987 to 1,800 million in 1993. In 1983, capelin and capelin spawn accounted for 2/3 of the value of the Norwegian export to Japan. Since the mid-1980s, however, salmon and mackerel have become the predominant species in this export (Olsen 1994). The increase in export of these two species

to Japan has been particularly intense in the last 2-3 years. Another important species is shrimps, which for many years has had a considerable market share. Together with salmon and mackerel, it currently comprises 83% of the total export value from Norway to Japan(Olsen 1994).

The total export of fish-products from Norway to Japan, according to different species, is shown in table 2.2.

Table 2.2 Export of fish-products from Norway to Japan, 1000 tons, 1994

Species	Mac-kerel, frozen	Salmon and trout, frozen/ fresh	Herring frozen/ fresh	Shrimps frozen/ boiled	Greenland Halibut/ Halibut, frozen	Cape-lin	Other	Total
1,000 tons	151	23	14.5	4	3	0.5	15	211

Source: Norwegian Seafood Export Council, annual report 1994

Frozen mackerel is quantitatively the single most important species, with over 70% of the total export of fish-products from Norway to Japan. Next come salmon and trout with 10%, and herring with 7%.

The Norwegian export of mackerel to Japan has increased rapidly since 1990. It reached a peak of about 165,000 tons in 1993, and Norway is by far the most important exporter of mackerel to Japan. Japan has, however, itself a considerable catch of mackerel (512,000 tons in 1994). In the same period, 1990-1994, the prices on Norwegian mackerel were nearly halved. From being above the average price on imported mackerel up to 1989, it was in 1994 nearly 20% lower (Olsen 1994). If this tendency is a result of the market forces, a continued decrease in relative prices on Norwegian mackerel should also increase exported quantities of mackerel from Norway to Japan in the future. As Norwegian exporters are private entreprises operating in a competitive market, such an increase will be limited due to decreasing profitability. On the other hand, a decrease in transportation costs will lead to a drop in prices on Norwegian mackerel without this reducing the profits of Norwegian exporters. A continual increase in import of mackerel to Japan, together with decreased transportation costs, given that the relative prices on mackerel are not changed, will thus contribute to a further increase in the Norwegian export of mackerel to Japan. Consequently, the demand for transportation will also increase.

Norway exported 15,500 tons of salmon and 7,500 tons of trout, of which nearly all was farmed fish, to Japan in 1994. About 80% of the exported salmon was fresh, whereas 95%

of the exported trout was frozen (Norwegian Seafood Export Council 1994). The reasons for Norwegian exporters to concentrate on fresh salmon to the Japanese market are hardly to be found in the prices which the exporters receive on the Japanese market. The difference in FOB prices between fresh and frozen salmon, as registered by the Norwegian Seafood Export Council, was by the end of 1995 only 4-5% in favour of fresh products. In the wholesale prices on the Japanese market the difference is 25% in favour of fresh products. Most of this difference can, however, be explained by higher transportation costs. This will be further discussed in chapter 4.

In our attempt to explain why Japan only takes 1.3% of its total import of 196,000 tons of frozen salmon from Norwegian exporters, (Olsen 1994), we probably have to look at transportation costs and alternative markets. Most of the Norwegian farmed salmon is exported to European markets, whereas most of Japan's imported salmon comes from American countries, such as the USA, Chile and Canada, and to a lesser degree Russia (Norwegian eafood Export Council). This trade pattern probably leads to lower total transportation costs than if Japan should import a larger share of the frozen salmon from Norwegian exporters. Consequently, a reduction in transportation costs may lead to an increase in the Norwegian export of frozen salmon to Japan. We will discuss this further in chapter 4.

On the other hand, 28,500 tons of trout were imported to Japan in 1994, of which 7,100 or approximately 1/4 came from Norway. In the same year Japan imported about 18,000 tons of fresh salmon, of which about 12,000 tons, or 2/3 came from Norway (B.E.Olsen, Norwegian Institute of Fisheries and Aquaculture, unpublished data). One reason for these relatively large shares may be the high quality of Norwegian farmed salmon and trout, which make them suited for transportation in fresh condition. Another reason may be that the supply of trout is limited on the world market. A possible consequence of the last argument is that if the supply of farmed trout from American countries is increased, the Norwegian export may, given that other factors remain constant, drop.

In recent years, Norway's share in the Japanese salmon market has increased, but prices for Norwegian salmon have dropped compared to salmon from other countries exporting to Japan (Olsen 1994). Chile and Australia especially are becoming serious competitors to Norway's market shares, and efforts have to be made to improve the quality of Norwegian salmon products if the export value is to be maintained. If the rise in market-share is mainly due to a drop in prices, future increases in export of salmon from Norway to Japan is limited. This is due to the relatively low profitability in Norwegian salmon-breeding industry today, and transportation costs which account for about 10% of the export value. On the other hand, if the use of NSR leads to lower transportation costs, this will, other factors remaining constant, increase the relative competitiveness of Norwegian salmon, and boost prospects for increased exports to Japan.

Prices for herring have also dropped in recent years, and the imported quantities of this species to Japan have not increased correspondingly. The USA is by far the most important exporter of herring to Japan with its 31,700 tons in 1993. Norway exported 14,700 tons this year, while the total Japanese import of herring amounted to 61,000 tons (Olsen 1994).

2.2 Other countries in the Far East

Compared to Japan, the other countries in the Far East receive only minor quantities of marine products from Norway. This is shown in table 2.3.

Table 2.3 Export of fish products from Norway to countries in the Far East, 1000 tons, 1994

Species	Mackerel	Salmon	Herring	Other	Total
Singapore	12	0.7	0.05	0.65	13.6
Taiwan	1.1	4.5	0.1	2.0	7.7
Philippines	4.2	-	0.8	-	5.0
South Korea	2.1	0.6	1.6	0.5	4.8
Hong Kong	2.6	1.1	0.3	0.6	4.6
China	2.2	0.1	0.1	0.2	2.6

Source: Norwegian Seafood Export Council, annual report 1994

Compared to Japan, the import of fish-products from Norway to the other Far East countries is nearly insignificant. Totally, Singapore is by far the most important importer of fish products from Norway in the Far East, when Japan is not included. Taiwan, with an import of Norwegian fish products of about half the quantity of the Singaporean import, is the second largest. All the mentioned Far East importers of fish products from Norway are countries with large populations. It is expected that the present economic growth and increasing prosperity of the population will lead to an increase in demand for fish products among the private consumers. Given a stable access to the mentioned species and a competitive development in costs, the increased demand will in itself lead to increased export of Norwegian fish-products to the Far East. Reduced relative costs, for example as a consequence of lower transportation costs, for Norwegian exporters and/or a better development in the access to the mentioned species, can even increase the Norwegian share of the total import. Thus the demand-induced increase in export of fish-products from Norway to the far East will be enhanced.

Quantitatively, mackerel is the main species traded between Norway and the mentioned Far

East countries. Singapore is the most important importer of Norwegian mackerel in the area. In 1994, it imported more than 12,000 tons of frozen mackerel from Norway. The Philippines imported somewhat above 4,000 tons of frozen mackerel from Norway, while quantities in the range of 1,000-2,500 tons were sold to China, Hong Kong, South Korea and Taiwan. As all the exported mackerel is frozen it is transported by ship, and may thus be relevant for transportation along the NSR. Whether one can expect an increase in the quantities depends on the income-elasticity of mackerel-products. This means; what happens to the demand for mackerel-products when the income of a household increases. If this leads to increased or at least stable expenditure shares, the mere increase in general prosperity in a country will lead to increased demand for mackerel-products.

Next to Japan, Taiwan is the most important importer of Norwegian salmon in the Far East. In 1994, the country imported about 2,500 tons of fresh salmon and a little below 2,000 tons of frozen salmon. In the course of the last 3-4 years, the Norwegian export of salmon to this country has risen considerably. Hong Kong imported around 1,000 tons of fresh salmon, but only somewhat below 100 tons of frozen salmon in 1994. Its import of fresh salmon from Norway has increased since 1990, while the import of Norwegian frozen salmon has decreased since 1992. As it is only the frozen salmon which is suitable for transportation along the NSR, this development gives, other factors remaining constant, poor prospects for a development of the NSR with regard to transportation of fish products. Singapore and South Korea both imported a total of 600-700 tons of Norwegian salmon in 1994. Both countries imported more fresh salmon compared to frozen. Other marginal importers of Norwegian salmon in Southeast Asia are Malaysia, China and Thailand.

Frozen herring was exported from Norway to South Korea, Hong Kong, the Philippines and Taiwan. South Korea was the largest importer, with 1,600 tons. The other countries imported only marginal quantities, all below 1,000 tons.

3 SEABORNE TRANSPORTATION OF FISH FROM NORWAY TO THE FAR EAST

3.1 Seaborne vs land- and airborne transportation of fish

As was mentioned in chapter 1, we have not done any further investigations on how well seaborne transportation is suited for long-distance transportation of fish products, but taken this as an assumption. Choosing an empirical approximation, we can only state that more than 90% of the export of fish products from Norway to countries in the Far East, measured in weight, is transported by ship (Norwegian Seafood Export Council). The vast majority of this is transported either on refrigerating vessels or on reefers (freezer containers), and all the ships run south of the equator. Alternative ways of transportation is plane and a combination of truck and train. Since relatively small quantities are transported by plane, scheduled flights have mainly been used (Trondsen and Jakobsen 1994). As this mode of transportation is relatively expensive, it is only used for fresh salmon/trout. The truck/train transportation runs through Russia, which make it both difficult to organize and insecure.

The causes of the present distribution of exported fish from Norway to countries in the Far East according to mode of transportation will have implications for the future choice of transportation with regard to fish products. If choosing seaborne transportation today is merely a result of lacking competitive alternatives, increased efforts to develop such alternatives can easily change the present dominance of seaborne transportation in favour of land- and airborne transportation. If seaborne transportation, both technically and economically, is the most efficient way of transporting fish over long distances, the present dominance will probably not be considerably changed. This presupposes that the present division on fresh and frozen products is maintained.

3.2 Different modes of seaborne transport

Frozen fish-products from Norway to countries in the Far East are transported by ship, whereas fresh products (fresh salmon) are transported by plane. Of the frozen products, a little more than half (52%) is transported in reefers, whereas the rest is transported by refrigeration vessels (primary data from Norwegian fish-exporters).

The refrigeration vessels are mostly freight vessels, coming from Japan to buy fish in Europe. Some of them sail along the coast of Norway buying mackerel from Norwegian receivers/dealers. When the vessels are filled up they return to Japan. Total transportation costs pr kg are about 5-10% lower compared to the use of reefers, but the quality of the transportation is also lower. It is therefore only "cheap" fish, like mackerel, which is transported by refrigeration vessels.

Salmon and herring is transported by reefers. A few larger container charterers dominate the market. Among these the Danish company Maersk Line is the largest, and it is also used by all our respondents. In recent years Russian container charterers have entered this market. They often underbid the established companies, and gain market shares on lower prices. This strategy is, however, of limited success when used on Japanese importers of fish from Europe, as they often put quality above price. Thus the Japanese often prefer large, well-known companies, with a stamp of quality, to undertake the transportation of their products, even though these are more expensive. Other countries in the Far East are more price-oriented.

3.3 Maersk Line

The following information is based on a personal interview with an employee at Maersk Lines office in Oslo in June 1995. Maersk Line, initially a break-bulk ocean carrier, was transformed into a fully fledged container charterer in the mid -70's, and is today the largest charterer of its kind in the world. It has a comprehensive global transportation network and provides services to and from North America, Europe, Asia, the Middle East and Africa. The company's two most important single services are from Europe to North America and the Far East, respectively. The latter accounts for approximately 50% of the company's activities, and the transportation route is marked on the map in figure 3.1.

Maersk Line's most important competitors on this service are the American company Sealand, Evergreen from Taiwan and a few Japanese charterers. It co-operates with other large container charterers in the running of terminals in different ports and the utilisation of feeder lines (ships bringing containers from loading berths to the main ports for the actual service). The company owns the main share of its freight material and all its containers. The ships used for the services to the Far East have a capacity of approximately 3,000 containers and on an average amount to 50,000 dwt. On shorter distances, smaller container ships are hired. In Japan, local companies have to be hired to conduct the internal transportation as foreign enterprises are not allowed to do this. In the future Maersk will develop its freight supply towards the use of larger ships concentrated in fewer ports.

The average price of a reefer is $ 5,000-5,500, and somewhat less for a dry cargo container. These are standard tariffs used by all members of the Far East Conference, in which Maersk participate. Most container charterers participate in this conference, but as mentioned above, there are also outsiders who underbid these prices. As far as insurance is concerned, all charterers are obliged by law to have specific insurance arrangements. The most common one is connected to SDR (special drawing rights) and allows the charterer to draw 6.33 SDR units per kg cargo.

As from 1995, Maersk Line can offer its customers distant storage in Rotterdam. There has

Figure 3.1

always been a need for storage connected to the export of fish products, and until now all storage has taken place in Japan.

Considerably more frozen goods are transported from Europe to Japan and other countries in the Far East than the other way round. As a result of this, the charterer has to use parts of the reefers for dry cargo from the Far East and back to Europe. This leads to a reduction in income as compared to if frozen goods were transported in both directions. This uneven freight balance is one of the major obstacles to increase profitability. It is, however, not obvious that increased profitability on the Far East Lines will lower freight rates.

When it comes to more arbitrary factors the charterer claims to have no particular problem with its transportation between Europe and the Far East. Its ships are too large to run the danger of being exposed to pirate activities, and the weather rarely causes delays or other more serious problems. The main problems are connected to the operations in the ports, as the line uses increasingly larger ships, and port authorities everywhere urge them to stay for as short a period as possible and occupy as limited a space as possible.

4 EXPORT OF MACKEREL, SALMON/TROUT AND HERRING FROM NORWAY TO THE FAR EAST

4.1 Presentation of sample

Turning to the supply side, we have concentrated on mackerel, salmon and herring, which quantitatively are the main (largest) species exported to the Far East. Quantitative and qualitative data are collected from 13 Norwegian companies, which during the last 3-4 years have exported the mentioned species to Japan, Singapore, Taiwan, Philippines, South Korea, Hong Kong and/or China. The exporters were selected from a list over all Norwegian companies which during the last 2-3 years had exported fish-products to the mentioned countries. The list was prepared by the Norwegian Seafood Export Council. Among the selected companies are the most central companies exporting marine products to the Far East, and the sample also consists of both new and more established exporters. The data were collected during summer and autumn 1995. Five of the 13 exporters were interviewed personally, seven exporters were interviewed by telephone, and one answered a questionnaire. The interviewed persons were mainly the leader of the company for smaller companies, and export-manager (for Far East markets) in the larger companies.The questionnaire was identical to the interview-guide, and is enclosed at the end of the report. The data was collected by the authors of the report.

As for the representativeness of the sample, we have tried to take into account both location, size of the company and number of years with export to countries in the Far East. The qualitative data sets from each company show, however, similar tendencies, irrespective of such background variables. One criterion for representativeness can thus be the share of total export of fish-products from Norway to the above mentioned countries covered by the sample. Both actual export, measured in volume, and export shares are given in table 4.1.

Table 4.1 Properties of the sample

Species	Mackerel	Frozen salmon/trout	Herring
number of respondents	9	6	8
export from Norway to Japan by the companies in the sample, 1000 tons	82.5	7.2	6.7
total export from Norway to Japan, 1000 tons	171.2	12.2	16.2
share of total export	48%	59%	41%

As it is only frozen (and perhaps salted) fish products which are relevant for transportation along the NSR, we will concentrate on this part of the export from Norway to countries in the Far East.

As mentioned earlier, the most central Norwegian exporters of fish products to the Far East are included in the sample, and it covers companies from Egersund in the South to Tromsø in the North. There are, however, two characteristics of the sample which may make it biased. First, there are only a few companies from Northern Norway included. This is either due to refusal to give any information, or lack of/insignificant export to Far East countries in the last 3-4 years. If the low number of North Norwegian companies in the sample reflects that there are relatively few companies in this part of the country which have any significant export to the Far East, this characteistic does not contribute to any bias in the sample. This seems to be the case for herring-exporters. Many North Norwegian exporters of herring had dropped the Far East market. The main reasons for this were low production because of lack of raw material and more profitable markets in Europe, especially in Eastern Europe. Second, as is also seen from table 4.1, the exporters of herring have a lower representativeness compared to exporters of mackerel and salmon. This is due to the fact that many of the registered exporters had ceased exporting to markets in the Far East. Most of the herring-exporters in the sample also export other species, mainly mackerel, and the herring-trade is not their main activity. The sample thus contains very few companies which have production and export of herring as their main activity. If there are only small differences in the view of for example the importance of transportation-costs for the competitiveness between companies with export of herring as main- and side-activity, this characteristic does not make the sample biased.

The questions asked concerned relatively concrete issues, on which the respondents were rather well-informed. This is especially true for the first 16 questions. The main emphasis was also placed upon these questions. The interviewer emphasised that the answers would be treated confidentially, and that only aggregated data would be presented in the report. The last10 questions concern the characteristics of markets and customers in the Far East, prospects for future development of these markets and the future strategy for the company regarding the markets. These questions were of a more hypothetical and subjective character, and touched on issues which for some companies were not regarded as open information. As many of these questions will to a large extent express subjective opinions of the respondents, not neccessarily based on knowledge, analysis or rational arguments, we have in this report mainly quoted comments which are repeated by several of the respondents. Exceptions are made for comments of special relevance for the subject of this project, and comments which the authors find throw light on the subject in new and interesting ways. In the preceding chapters we have tried to distinguish between these two types of information.

Finally, nearly all of the respondents had their main experience with markets in the far East from Japan. Thus the following presentation will mainly reflect conditions in, experiences with and future prospects of the Japanese market and Japanese customers. Several of the respondents said that there were large similarities between the Japanese market and other markets for fish-products in the Far East. One main difference was, however, that the latter markets were expected to expand more rapidly compared to the Japanese. It will be emphasised if general comments in this chapter are restricted to only the Japanese-, or only other Far East markets.

4.2 Salmon/trout

Norwegian companies export fresh as well as frozen salmon to the markets in the Far East. In 1994 the total export of fresh salmon to these markets amounted to 16,180 tons, whereas 12,210 tons of frozen salmon/trout were exported (Norwegian Seafood Export Council). Fresh salmon is transported exclusively by plane. Scheduled flights are primarily used, but parts of the export have occasionally been transported by charter flights. The problem with the latter variant is that the return capacity is not utilised, a fact that makes chartered flights the less desirable of the two. Frozen salmon, on the other hand, is exclusively transported in reefers. As the price for the products to a very high degree is dependent upon their quality and appearance, it is important to avoid reloadings and keep the goods well wrapped and protected from thrusts. As a result, refrigeration ships are not used for this kind of transportation. Table 4.2 shows nominal and relative prices for seaborne and airborne transportation of salmon/trout from Norway to Japan.

Table 4.2 Product prices and transportation costs for salmon

	fresh/airborne	frozen/seaborne
producer prices, NOK/kg*	39.14	30.97
nominal transportation costs, NOK/kg	22	2,50-3,00
wholesale prices, NOK/kg*	59.23	41.42
transportation costs in % of import prices	37	7

Sources: Norwegian Seafood Export Council, Norwegian exporters of salmon and trout to the Far East, Olsen 1994

* Average prices for the year 1993. Wholesale prices are the prices fish auctioners have to pay importers at the Fish Wholesale Market

There was in 1993 a considerable diffeence in producer prices on fresh and frozen farmed salmon to the Japanese market. In 1994, however, this difference was nearly eliminated, as the fresh salmon was paid NOK 38.88 and the frozen NOK 36.55. The difference in prices

in 1993 was mainly due to the enormous stock of unsold frozen salmon which was a result of the bankruptcy in the producer organisation. The large difference in wholesale prices on fresh and frozen salmon respectively is mainly due to large differences in transportation costs. The figures in the table show that transportation costs are not covered for airborne transportation. This is due to the use of different sources. The prices are average prices for the total export of fresh salmon to Japan, whereas the transportation costs refer to average costs for airborne transportation to the exporters in our sample. Regarding frozen salmon, there is a large difference in producer and wholesale prices. The reason is that a sales tax was placed on all frozen salmon to cover part of the expenses following the bankruptcy in the producer organisation.

Regarding seaborne transportation, the costs for a 40 foot reefer amount to NOK 38,000. This leaves the freight costs at NOK 2.5-3/kg, which is only 8% of the wholesale price. In comparison, one has to pay NOK 22/kg for transportation by plane. This constitutes 39% of the wholesale price. The low relative share of the transportation costs for frozen salmon can be one reason why the exporters of frozen salmon in our sample were not very concernd about efforts to reduce transportation costs. Avoiding damages to the cargo, reliability and punctuality were for them more important factors in the choice of transportation. On the other hand, there is still much left to be done concerning the airborne transportation of salmon to the markets in the Far East. The possibilities of regular and cheaper transportation of salmon from Norway to the Far East is analysed in Trondsen and Jakobsen (1994).

Insurance costs come to some 0.2% of the value of the goods. The Japanese have very good national insurance arrangements and usually take care of the insurance of the goods. Some Norwegian exporters have their own additional insurance.

Container freight from Europe to Japan takes 28 days on average. The export takes place the whole year round, but is most intense in the period from August to December. Summer is the most quiet time of the year in this context. This is due to conditions both on the supply and demand side of the market. The growth of farmed salmon is positively correlated with the temperature in the water. Warmer water makes the fish eat more, and therefore it gains more weight during summer compared to the rest of the year. Given stable prices throughout the year, this will give a higher contribution pr fish to the producer if it is slaughtered and sold during late summer and autumn. Further, the supply of salmon from Australia and Chile to the Japanese market is large during winter and spring, and consequently it is hard to achieve high prices for Norwegian salmon at this time of the year (Olsen 1994). Regarding the demand, the Japanse consumers favour fat fish. This implies that the most profitable adjustment taking consumer preferences into consideration, is to export the fat "autumn-salmon" to the Japanese market.

The shipping frequency varied greatly between the companies. Most of them discharge goods every week, whereas others do this as rarely as once a month. 1-2 containers are usually discharged on each occasion. The most common sales condition is cif (cost, insurance and freight) or c & f (cost and freight). The latter means that the exporter to a large degree is responsible for the freight, whereas the buyer provides insurance. This condition is mainly the result of the already mentioned insurance arrangements of the Japanese. The Norwegian exporters decide on transport company and means of transportation, but are usually open to suggestions from the customers. The latter occasionally have preferences for particular charterers which have gained a stamp of quality, as for instance Maersk Line, although these may be more expensive than less recognised charterers.

The capacity of the charterer to meet the demand of the customer at any time, proved to be one of the main criteria in the choice of charterer. Other important factors were a comprehensive transportation network, security and punctuality in transportation as well as transport time. The latter is connected to the interdependence of insecurity and profitability. Many of the Japanese customers are large commercial houses which resell the fish on the internal market. They usually order the fish when prices for salmon are high in Japan. The more time it takes from the ordering to the receipt of the goods, the greater the probability that prices have changed (i.e. dropped) in the meantime. Quick transportation thus reduces the insecurity connected to price fluctuations in the market. On a more general basis, reductions in transportation time always reduce insecurity since neither seller nor buyer has control of the goods during transportation.

As already mentioned, the most important importers of Norwegian salmon in Japan are big commercial houses. Some Norwegian exporters have attempted to sell their products directly to fish processing plants or sales companies in order to avoid the gross profit of the import link. This has turned out to be very difficult, however, primarily because of the restricted import regulations of Japan. Furthermore, smaller firms usually have less experience in doing business with foreign actors and prefer to leave these activities to the more professional in this field.

The most important criterion for success on the Japanese market is to develop long-term connections and prove oneself to be a stable and reliable supplier. Furthermore, the Japanese are very quality-conscious. There is some disagreement among the companies as to whether they are ready to pay more for quality goods. The prospects for long-term trade connections are often good after a successful entry into the Japanese market. On account of this fact, along with the growth in the Japanese population and average purchase power, most Norwegian exporters of salmon expect a positive development on the Japanese market. This is also true for markets in countries like Taiwan, Singapore and Hong Kong. Due to their stability, these markets are particularly attractive, and several of the companies expressed

their intention to make special efforts to increase their share of these Far Eastern market. Regarding markets in countries like China, Philippines and South Korea, the expected rise in average prosperity and populations are the main factors to determine a positive development in the markets for fish-products.

These results show the same tendency as a survey made by Trondsen and Jakobsen in 1993 among 18 Norwegian exporters of fish products to Japan, Taiwan, Singapore and Hong Kong (Trondsen and Jakobsen 1994). 84% of the respondents believed that the growth in export to the Japanese market would increase or strongly increase. 56% of the respondents shared this opinion regarding the export of fish-products to other Far East markets.

As far as transportation along the NSR is concerned, the main factors for transportation of salmon to the Far East is the exporters' dependency upon *stability in supplies*, *punctuality* and *careful handling* of the goods. For the first two factors the NSR is not competitive today. The main season for export of salmon/trout to the Far East is from August to December. This to a large extent coincides with the operational season for the NSR.

4.3 Mackerel

All mackerel exported from Norway to the Far East, about 85.000 tons in 1994, is frozen. Transportation is carried out either in reefers or on refrigerating vessels. Among the exporters in our sample, somewhat more than half the products (52%) are transported in containers (reefers) and just below half (48%) in refrigerating vessels. Maersk Line is the predominant charterer on container transportation, but other charterers like Sealand, Nyk (Japanese) and Hunday (Korean) are used. Feeders are used between Ålesund, Måløy, Florø, Bergen, Stavanger, Egersund and Rotterdam. Most refrigerating vessels are Japanese. So-called trampers come from Japan to Norway, load fish along the coast and return to Japan when a maximum loading capacity of 20,000 tons is reached. These vessels are primarily used from mid-season; at the outset of the catch season it is important to transport the fish to Japan as quickly as possible because the producers usually are short of raw material. At this time, containers are most often used as this is the fastest way of transportation. Some exporters have considered hiring separate vessels for this task, but such a solution demands very large quantities of fish, and also represents a problem as far as the return of the ship is concerned. Table 4.3 shows prices on mackerel and transportation costs, all connected to export from Norway to Japan.

Table 4.3 Prices on product and transportation by reefers and refrigeration vessels

	Reefers	Refrigeration vessels
producer prices, NOK/kg*	4.02/5.01	4,02/5,01
nominal transportation costs, NOK/kg	1.55-1.70	1,45-1,55
wholesale prices, NOK/kg*	6.62/8.28	6.62/8.28
transportation costs in % of import price	19-26	17-23

Sources: Norwegian Seafood Export Council 1994, Norwegian exporters of mackerel to Japan and the Far East, Olsen 1994

* The first price refers to mackerel under 600 g, and the last to mackerel over 600 g, the prices are average prices for 1993. Wholesale prices are the prices fish auctioners have to pay importers at the Fish Wholesale Market

Mackerel is a low price product. The producers are paid between NOK 4-5, depending on the size. Transportation costs amount to $ 240-265 per ton, i.e. $ 5.400-5.760 for a container of 24 tons. This gives a freight cost of NOK 1.55-1.70 per kg. This constitutes on average 38% of the producer price and 23% of the wholesale price. Refrigerating vessels cost $ 220-240 per ton, which gives a freight cost of NOK 1.45-1.55 per kg. On average this is about 1/3 of the producer price and 20% of the wholesale price. Compared to frozen salmon the transportation costs for mackerel constitute relatively large shares of the product's value. It can in this connection be mentioned that the exporters of mackerel to markets in the Far East are more interested in reducing the transportation costs than the exporters of salmon. Some charterers, e.g. Russian refrigeration vessels demand as little as $ 140-150/ton, or NOK 0.9-1.0/kg. These cannot offer the same security, punctuality and quality as more recognised and expensive charterers, and are considered outsiders in the transportation market. The quality-conscious Japanese prefer to avoid such charterers.

Most of the mackerel exported from Norway to the Far East is sold FOB (free on board), which implies that the customer is responsible for the freight. They decide on the means of transportation and charterer, and usually take care of the insurance (ref. the afore mentioned insurance arrangements of the Japanese). The fact that the Japanese mainly make the decisions regarding freight, is an important reason why an expensive transportation charterer such as Maersk Line is the predominant charterer of fish from Norway to Japan. No chances are taken as to the quality of the products. This also implies that the expressed eagerness of the respondents in our sample to reduce transportation costs, can't be attached great importance when it comes to the future choice of transportation.

The mackerel season lasts from August to February and is at its most intense in the period

from September to December. During the season, most exporters discharge mackerel in the Far East every week. The smaller exporters discharge only on a monthly basis. As the season is comparatively short, considerable quantities are unloaded at every discharge. The largest exporters unload 10-20 containers a week. At the beginning of the season, problems occur with the freight capacity. Most exporters say they have experienced a shortage in containers, which delays the discharge. As the goods are usually not paid until they have arrived at the destination, this also implies a delay in payment and loss of interest income. For this reason, a large charterer with a large capacity is desirable.

The main factor when it comes to choice of transportation of mackerel from Norway to the Far East, is transportation-costs. As the freight costs are already considerable, efforts are made to reduce them whenever possible. Other important factors in this connection are the means of the charterer to meet customer demands at all times, the presence of a comprehensive transportation network with services at most destinations, security and punctuality in transportation. Apart from in the very beginning of the season, transportation time turned out to be of less importance. In some cases, at the end of the season when warehouses in Japan are full, long transportation time will often be an advantage. During transportation the fish does not cause storage expenses for the importer. As long as transportation costs are not related to transportation time, and storage is needed upon arrival of the goods, a comparatively long transportation time often turns out to be profitable. At the beginning of the season, on the other hand, warehouses are empty and the demand for the products is high. Thus a short transportation time is an advantage.

The main importers of Norwegian mackerel in Japan are big commercial houses. Some exporters have attempted to evade these professional importers and do business directly with fishing companies/ producers. This has succeeded to a certain extent, but the commercial houses are still the main customers of Norwegian exporters.

As is the case with the export of salmon, the development of long-term connections along with the image of being a stable and reliable supplier seem to be the basic criteria for success on the Japanese market for exporters of mackerel. On the European markets, exporters can appear, disappear and reappear without notable consequences for their subsequent market potential. If, on the other hand, one falls out of the Japanese market, e.g. due to unstable supplies or unsatisfactory quality, much effort is needed to find the way back in. In periods when supplies are limited, most exporters thus give priority to the Far Eastern markets. Among the companies of our sample, there is a general attitude that Japanese customers demand higher quality and are willing to pay more for the products than is the case with other importers.

The exporters we interviewed intend to stabilise or increase their export of mackerel to the Far East in the years to come. These markets are attractive as they are characterised by a

rapid growth. This growth is due to an increase in both population and average purchasing power in the region. The main problem for some exporters is the inability to supply sufficient quantities of raw material to meet the demand of the markets in the Far East. The following two factors are of particular importance when an exporter considers the market conditions:

1) to which degree the market in question has to be worked to secure entry into it
2) the level and stability of prices

The Japanese and other Far Eastern markets represent a barrier for Norwegian exporters in terms of the former factor. When it comes to the latter condition, however, these markets score high. Of course, the two factors must be balanced when market strategies are elaborated.

Until now, it is almost exclusively frozen round mackerel that is exported to the Far East from Norway. Some exporters assume, however, that a larger share of processed fish products will be exported in the future. The transportation of fish waste across half the globe might seem quite meaningless. An increase in the export of processed goods would reduce the freight volume considerably. As a consequence, the problem with shortage of containers at the beginning of the season would be eliminated. Furthermore, such a development would reduce the need for storage and increase the level of value formation in Norway. Norway primarily exports unprocessed mackerel to the Far East, because methods of processing the mackerel without loss in quality are still not found. When offals and head are removed, the fat percentage is also reduced. The fat makes the mackerel keep better in a frozen condition, and besides, the Japanese generally favour fat fish. All this implies that if the export of processed mackerel to Japan is to increase, transportation time will play an increasingly important role.

As for salmon, the export of mackerel to Japan and other Far Eastern countries demand security and punctuality with regard to transportation. In addition there is a continuous pressure on freight rates and a need for large transport capacity. Both the shortage of raw material on the Japanese markets in the beginning of the season, and the prospect of delivering more processed fish to this market in the future demand shorter sailing time. This favours the NSR compared to existing transportation alternatives. The main season for export of mackerel is from August to February, which partly coincides with the operational season of the NSR.

4.4 Herring

The Norwegian export of herring to the Far East has decreased the last two-three years. In 1994 it amounted to a little above 17,000 tons, whereas in 1993 it was over 21,000 tons. In 1995 (in the beginning of December) it reached about 15,000 tons (Norwegian Seafood

Export Council).

The Norwegian exporters of herring to the Far East are to a large extent the same companies that export mackerel to these markets. The export of herring however, constitutes less than 10% of the quantity of mackerel exported. It is primarily frozen herring and salted fillet of herring that are exported to the Far East from Norway. The products are transported in reefers, or dry cargo containers. The herring season lasts from September/October to November/ December. During the season, exporters try to discharge herring to the Far East as often as possible, usually once a week.

As the Japanese have a liking for fat fish, herring should theoretically suit this market. Due to small quantity, limited flexibility regarding transportation and relatively low product prices, the freight rates constitute a relatively high share of total export value. Many of the companies which exported herring to the Far East in 1994, due to more profitable markets in Europe and insufficient supply of raw material, have terminated or strongly reduced this export in 1995. The present exports of herring to countries in the Far East have such an export only as a side activity, while export of other fish products to these markets are their main trade.

As the situation is today, the prices of herring must be considerably higher in order to be interesting for Norwegian exporters. Traditionally, Eastern Europe has constituted an important market for Norwegian herring. This market is easily accessible and involves comparatively low transportation costs. As a result of this, many Norwegian exporters of herring have chosen to direct their products to the markets in Eastern Europe instead of the Far East. Herring is a less well-established product on the Far Eastern markets than mackerel, and more exposed to fluctuations in both prices and demand. Several of the exporters in our sample expressed doubt as to whether they will continue to give priority to the export of herring to the Far East.

5 SUMMARY AND CONCLUSION

The markets for fish products in the Far East are growing. The people in this area favour fat fish, which make species like mackerel, herring, farmed salmon and trout especially suitable. When an exporter is accepted by Japanese or other Far Eastern importers, the access to these national markets is very stable. Acquiring such acceptance, however, costs both time and effort. The Japanese in particular are very quality-conscious, and are to a certain degree willing to pay more for products of high quality. This is especially true for mackerel, and to a lesser degree for salmon/trout.

These attributes make Japan and other Far Eastern countries attractive markets for Norwegian mackerel and farmed salmon and trout. For different reasons, these markets have so far not been equally attractive for Norwegian exporters of herring. Norwegian exporters of mackerel and salmon/trout express an interest to maintain or increase their market shares in the Far East. These markets will for a majority of our respondents be operated before European and American markets.

All export of mackerel and 1/3 of the export of salmon/trout (all measured in volume) from Norway to the Far East go by ship. Refrigeration vessels and reefers on ships are the main mode of seaborne transportation.

The main factors in the choice of seaborne transportation are:

- large and flexible capacity
- security of the products
- punctuality
- quality in the handling of the products

This is true for both mackerel and salmon/trout. In addition transportation time is important. For salmon/trout a shortening of the transportation time will reduce uncertainty regarding prices and profitability. For mackerel the shortening is only important in the beginning of the season, when the Japanese market lacks raw material. It will also be of importance if Norwegian exporters want to succeed in exporting more processed products of mackerel. Transportation costs are mainly important to the mackerel exporters. The Japanese importers are, however, willing to pay higher freight rates to get recognised charterers, with high quality standards.

The most hectic season for export of mackerel and salmon/trout from Norway to Japan and other Far East markets is between August-February, with a peak in September-December.

The four most important factors for the choice of transportation of mackerel and salmon/trout from Norway to the Far East, do not at a first glance point out the NSR as a strong alternative to the existing supply of transportation. The need for large capacity early in the mackerel season may make the NSR an attractive additional supply route, especially in August and September. Both the capacity and the demand for quality in transportation, implies that the use of the Route depends on to what degree the largest and best recognised container charterers and other conveyers will make use of it. If only Russian suppliers of transportation operate on the Route, the prospects for an extensive use with regard to fish products to the Far East will probably be poor. This statement is supported by the conclusion in Norheim (1992). Here it is stated that Murmansk Shipping Company at that time (1991) was not in a position to transport frozen fish in reefers from Alaska to Northern Norway through the NSR.

Our statement regarding the charterers of the route is mainly true in the short-term, and is based on the fact that the standard of Russian transportation equipment and quality of transportation services is lower than that of the larger western charterers. In the long-term the Russian may find it in their interest to adopt higher standards, and thus be competitive transporters of fish products to markets in the Far East through the NSR. We don't have any information which can make such a development more or less likely.

The extreme climatic conditions should make the NSR relatively safe in terms of piracy. Climate and weather conditions can on one hand be favourable, as it is cold and long storms such as the monsoon are rare. On the other hand the problem is of course ice, which can delay the progression of transportation severely. This leads us to the most critical factors for transportation of fish products from Norway to countries in the Far East; punctuality and stability. It should be obvious that the danger of being stuck in the ice will be an important obstacle for the container operator or other carriers when it comes to the question of guaranteeing for punctuality. Bad weather and ice conditions probably lead to the cancellation of scheduled departures. This will give the Route a bad reputation regarding stability. Corresponding remarks are also made in another INSROP-paper. In the INSROP discussion paper on project 07.2, Buchanan states that one big advantage of the NSR could be low costs. This, he continues, "is not necessarily as important to many liner shippers (or exporting companies, our remark) as logistical effectiveness, i.e. reliability and punctuality of service,". He further states that "many shippers of containerized cargo could be reluctant to use this route because of the increased possibility of cargo damage". Our empirical findings thus support Buchanan's more theoretical reasoning.

The peak season for export of mackerel and salmon/trout from Norway to the Far East coincides to a large extent with the operational season for the NSR, which is favourable for the Route.

In conclusion we can state that the NSR must be either considerably cheaper or have a sailing time considerable shorter than 28 days, in order to be competitive to existing supply of transportation for fish from Norway to countries in the Far East. The reason is that it will probably not be able to compete on factors which are regarded as the most important for the present exporters and importers; namely punctuality and stability.

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Intervjuguide for eksportører av fisk til Det Fjerne Østen*
*omfatter landene Hong Kong, Japan, Kina, Korea, Singapore og Taiwan

Bedrift:
Intervjuobjekt:

1: Mengde (tonn) og type fisk/sjømat eksportert til landene i 1994

	Fersk	Frosset	Annet
Laks			
Makrell			
Sild			
Reker			
Annet			

2: Verdi av den samlede eksporten av fisk/sjømat til landene i 1994

	Fersk	Frosset	Annet
Laks			
Makrell			
Sild			
Reker			
Annet			

3: Andelen av produksjonen som eksporteres til Japan/Østen

4: Hvor ofte sender dere laster?
Gjelder dette hele året eller er det hovedsesonger?
Hvor mye blir gjennomsnittlig sendt pr last?

5: Hvilke salgsbetingelser brukes ved eksport til Østen (f eks cif, fob, cad, annet)?

6: Hvem bestemmer hvordan frakten skal foregå?

7: Hvem og hvordan inngår fraktavtaler?

8: Hvordan organiseres frakten av fisk til Japan/Østen?

- internasjonale befraktere tar seg av all transport, fra utskiping fra anlegget til varene er hos mottaker
- bruker lokale befraktere til sentral hav i Europa, derfra overtar internasjonale befraktere
- chartrer selv skip og besørger frakten
- det er japanerne som sørger for all frakten
- annet

9: Hvem er de viktigste transportørene ?

10: Hvordan er kvaliteten på den frakten som dere bruker (har dere fått klager på ødelagt emballasje, tining av varene, forsinkelser etc)?

11: Hvordan er kapasiteten på fraktmarkedet i dag?

12: Hvilke transportkostnader opererer en med ved eksport til Østen?
Transportkostnadenes andel av total pris for importøren?

13: Hvilke forsikringskostnader opererer eksportørene med?

14: Hva er de viktigste faktorene ved valg av transportmåter, -ruter og transportører
- transporttid
- transportkostnader
- sikkerhet
- muligheter for lagring
- punktlighet
- stabilitet
- annet

15: Er alternative transportmåter og -ruter vurdert?

16: Hvilke lagerbehov har dere ved produksjon for eksport til Japan/Østen?
Gjelder dette for all produksjon/eksport eller er det spesielt for eksport til Østen?

17: Hvem er de japanske kundene, og hvor store er de?

- egne import/tradingselskap
- handelsgrossister, representanter for store handelskjeder
- annet

18: Hva kjennetegner de japanske kundene?

- vanskelige å ha med å gjøre

- forlanger mye
- stabile/ustabile
- svært forskjellig kultur
- annet

19: Hvordan har deres eksport til markeder i Japan/Østen utviklet seg de siste 5 årene?

20: Hvordan vurderer dere utviklinga i denne eksporten i de neste 5 årene?

21: Har dere tenkt å satse bevisst på disse markedene i framtida?

22: Er Japan og Østen stabile markeder å satse på?

23: Hva er evt hinder for å utnytte markedsmuligheter i Det Fjerne Østen?

24: Er det noe som særpreger markedene i Østen i forhold til markeder i f eks Europa, USA, etc?

- betaler mer
- har høyere kvalitetskrav
- legger større vekt på punktlighet
- vanskeligere å komme inn for nye aktører
- annet

25: Hvor er deres viktigste konkurrenter på disse markedene plassert (geografisk)?

- andre europeiske eksportører
- japanske leverandører når de har nok råstoff
- eksportører som ligger nærmere land i Det Fjerne Østen

26: Hvordan vil importørene i land i Det Fjerne Østen ha fisken/sjømaten?

- så lite bearbeidet som mulig, slik at de selv kan bearbeide den
- noe bearbeidet og delikat innpakket
- gjerne bearbeidet på norsk vis

River transportation of timber and timber based products in North West Russia

By Sverre Høifødt,
ACTA Consult

CONTENT

1. INTRODUCTION

This report is a continuation of a joint research project under the INSROP umbrella "Trade and commercial shipping aspects". The sub-program is called "The Northern Sea Route and possible regional consequences".

The first phase of the research work was carried out in 1994, as Part Project III.02.1. The analysed region covers the Norwegian counties of Nordland, Troms and Finnmark, the Swedish county of Norrbotten, the Finnish county of Lappland, The Russian republics of Karelia and Komi, the counties of Murmansk and Archangelsk, and the autonomous areas of Nenets, Yamal and Taimyr. The four major industries of this region were analysed: fisheries, minerals, petroleum and timber.

This paper supplements chapter 9 in the INSROP working paper no. 16-1995, III.02.1, on forestry and wood processing.

Co-operating institutions are NORUT Social Science Research, FINNUT and ACTA Consult. Except from the initial phase, in which the framework of the project was discussed, the co-operating institutions have been working separately on the different industry sectors. NORUT has looked into the fishery sector, FINNUT has covered minerals and petroleum, and ACTA Consult has carried out the research work on timber and the timber industry.

2. CONCLUSIONS FROM THE 1994 PROJECT

The main focus of Part Project III.02.1 was on investigating the interdependence between the development in the analysed region in general, and the development of the Northern Sea Route (NSR) as an efficient international route of transport. The general idea was on one hand that the development of the NSR as a competitive transport alternative might release industrial potentials within the region, and on the other hand that a positive regional industrial development might be of crucial importance for the future development of the NSR.

The 1994 project concluded that the petroleum sector, in a short to medium period of time, will generate the most important industrial activity with respect to the NSR development. The fisheries are expected to be of minor importance. Transport of mackerel and salmon/trout from Norway to the Far East might represent a potential trade for the NSR. However, to be competitive the NSR transportation costs have to be considerably lower than the alternatives, to compensate for reduced punctuality and stability.

The potential of the regional forestry and timber based industry is large. The Nordic industry is already a strong and dynamic international cluster. On the Russian side the timber resources and the industrial capacity are enormous. In 1994, however, the timber based industry in Archangelsk experienced multiple problems and depression. The situation was characterised by shortage of raw materials, low prices on international markets, old industrial equipment and technology, and lack of capital.

Nevertheless, large volumes of round timber, sawn timber, pallets, plywood, pulp, paper and cardboard was transported by boat from Archangelsk to markets in Europe, North Africa and elsewhere. When the domestic demand was reduced in the beginning of this decade, the Russian industry turned to export markets seeking new opportunities.

The 1994 project pointed at two important factors for the future potential of NSR transportation of timber and timber based products; the general rate of growth in Russia and previous COMECON countries, and the ability to strengthen the relations and the dynamics between the Nordic and the Russian forest-based industries. If a strong regional industry, based on integrated and dynamic relations across national borders, is developed, the report concludes that the NSR might become an important transport route for timber based products, both to the North Atlantic markets and to the North Pacific markets.

3. AIM OF THE STUDY

The 1994 project focused on the NSR hinterland, which means the most northerly areas close to the Arctic coastline. For centuries, however, the large Russian rivers running into the Arctic oceans have been transport corridors between the Russian inland and the export markets. Rivers such as Dvina, Ob, Yenisey, Lena and Kolyma stretch hundreds of miles, attaching the fertile and populated areas in the south to the open sea in the north. A general and simplified picture of the Russian transportation system can thus be drawn: the Trans-Siberian Railway in the south and the NSR in the north are the two major east-west transport corridors, and the many large rivers represent important corridors in the north-south direction.

When dealing with timber this picture is of special importance. While most of the productive forests are located far from the Arctic coast line, much of the timber based industrial capacity is located close to the coastal harbours.

The aim of this study has been to investigate whether or not:

- there is an unreleased timber based cargo potential for NSR transportation, when looking into the areas further up the large Russian rivers.
- it is likely that international shipping could contribute to developing competitive river operations, linking the Russian inland to the northern harbours and the NSR.

Map 1 Large Russian rivers and railways.

The many interviews carried out during the visit to Russia in May 1995 collected information that could shed light on these questions. The different kinds of data collected were:

- sailing conditions, described by river characteristics such as depth, sailing season, etc.
- river shipping companies in operation, and existing regulations of river operations
- logging activity and timber based industry along the rivers today
- present river transportation of round timber and timber based products
- conditions that could change the future flow of raw material and final products, i.e. new laws and regulations, changes in industrial competitiveness, new export markets

The information collected in May 1995 was meant to supplement the information collected one year earlier. This paper is based on data from both the visit in 1994 and the visit in 1995. To understand the two sets of data it is important, however, to realise the significant improvements in the international market conditions for timber and timber based products between these two junctures.

For practical reasons this investigation has been limited to the large rivers west of the Urals. That means primarily the rivers Dvina and Petchora, but the smaller rivers Onega and Mesen are mentioned, as well. The large rivers east of the Urals, Ob and Yenisey,

will be studied in another 1995 Part Project, while the rivers east of Taimyr might be the object of investigation in INSROP 2.

4. METHODOLOGY

This study is not based on any specific theory. The intention has simply been to gain more insight in the present situation in the timber industry located along the river systems of Onega, Dvina, Mesen and Petchora, and its future potential for NSR transportation.

The data basis for this study was collected on an 11 day tour to Archangelsk and Komi in May 1995. Further investigation and data collection has been limited by the resources available. On the tour to Archangelsk and Komi the following places were visited: Archangelsk and Kotlas in Archangelsk county, Syktyvkar and Ochta in the republic of Komi, and Narjan-Mar in the Nenets autonomous area.

Relevant information was collected by interviewing representatives for companies and regional authorities. Among others, the river shipping companies in Archangelsk, Syktyvkar and Petchora, the pulp and paper companies in Kotlas and Syktyvkar, mills in Syktyvkar, Petchora and Narjan-Mar, and the port authorities in Syktyvkar and Narjan-Mar, were visited. This was a supplement to the information collected in 1994, when several interviews were done in Archangelsk.

The interviews were prepared, but not standardised. Further, the interviews had to be adjusted to the actual respondents. Accordingly, the type of information we received was limited to the knowledge of the people we interviewed.

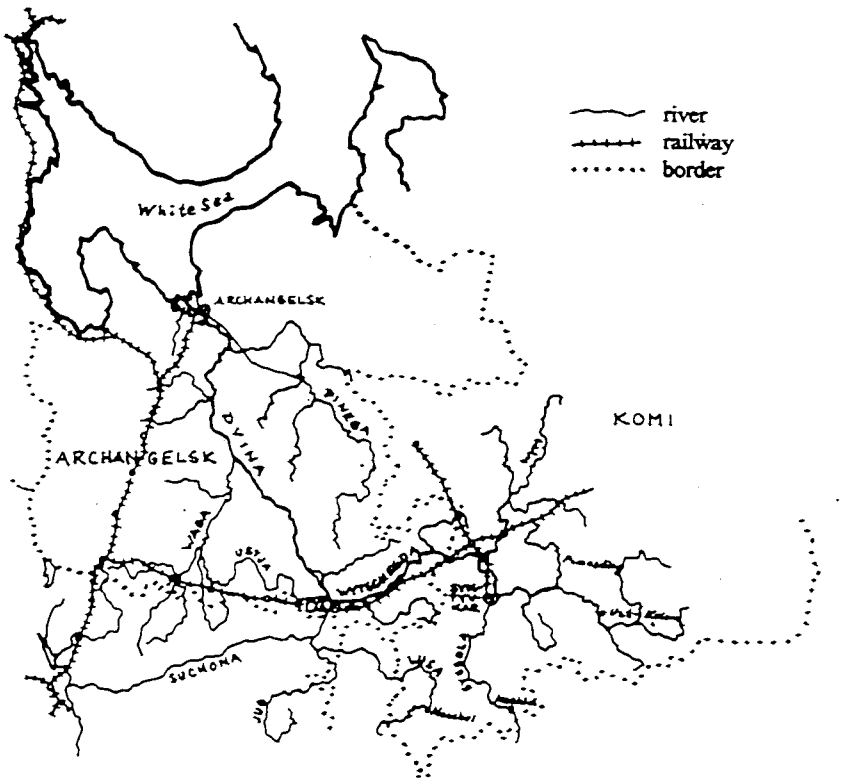
The study is focused on qualitative information. The quantitative information we received was often fragmentary, unsuitable for generalisation and not always reliable. Consequently, the figures presented are usually meant as illustrations, rather than complete descriptions.

5 DVINA

5.1 **Sailing conditions**

The influential area of the Dvina river system stretches into four counties and republics. While most of the main river and the tributaries Pinega, Waga and Ustja run within the county of Archangelsk, most of the tributaries Wytschegda, Wym and Syssola run within the republic of Komi, the tributary Suchona run within the county of Vologda, and the small tributary Lusa runs through both Kirov and Komi.

Map 2 The Dvina river system.



Dvina river has a sailing season of nearly five months. The main river system of Dvina is normally open from the beginning of May to the end of October.

The rivers are all quite shallow. In May and June the depth is at its maximum. Later in the season there is normally less water in the rivers, and consequently the maximum size of the vessels operating on the rivers is diminished.

For one month it is possible to navigate as far as 600 km up the Pinega river, to Sogra and Gorka.

The vessels operating up to Syktyvkar have a maximum depth of 1.5 meter, which for the specially designed river lighters means a size of 600 - 1000 tons.

5.2 River shipping companies operating on Dvina

Under the Soviet Union the Northern River Shipping Company had a monopoly position in the transportation market on the rivers Onega, Dvina, Mesen and all their tributaries. The company also runs shipyards - e.g. Weliki Utjug and Kotlas, harbours - e.g. Archangelsk, Kotlas and Syktyvkar, and other related activities.

As a result of the regionalisation the Northern River Shipping Company was in 1994 dispersed into three companies. The republic of Komi and the county of Vologda both established their own river companies, based on vessels from the previous fleet of the Northern River Shipping Company. While the Northern River Shipping Company is still operating within the county of Archangelsk, the Komi River Shipping Company and the Vologda River Shipping Company are now operating in the their own territories. Today, the 50 vessels of the Komi River Shipping Company are operating on Wytschegda, Wym and Syssola, while the Vologda River Shipping Company operates on Suchona, Lusa and Jug.

On Mesen and Onega the Northern River Shipping Company is still operating alone, but the activity on these two rivers is organised as separate divisions within the company. The number of employees in the company as a whole is now about 2,500.

Today, the river transportation is partly privatised. According to the 1993 regulations the river companies where all converted to stock companies. From the start the Russian state was a majority owner in these companies, while most of the remaining stocks were owned by employees. Today the state shares are reduced, and the plan is to sell the state-owned stocks on the open market after three years (1996). If this is carried through, any investors - also foreign - will probably be invited to buy.

As described earlier the previous monopoly situation of the Northern River Shipping Company is now split according to the new companies operational areas. However, the operators have so far kept their monopoly position within their own territories. No signals from the federal government about removing the river companies monopoly rights after 1996 have so far been given.

It should be stressed, however, that exceptions have already been made in other regions, where foreign companies operate on contract. Besides the river companies the large industrial companies have been operating a few vessels of their own. But these vessels are nothing but a minor supplement to the transportation run by the river companies.

5.3 **Forestry and timber based industry along the Dvina river**

Six pulp and paper factories and a large number of mills are located along the Dvina river system.

Two pulp and paper factories are located in Archangelsk City (Archangelsk pulp and paper industry and Solombola pulp and paper industry), one is located in Kotlas (Kotlas pulp and paper company), one is located in Syktyvkar (Syktyvkar pulp and paper company) and finally two minor factories are located in Sokol (Suchona-Sokol pulp and paper company). The following description is based on information from the Kotlas and Syktyvkar companies.

The Kotlas pulp and paper company produces various qualities of pulp, paper and cardboard. In the Soviet period most of the products were sold in the domestic markets and in other COMECON countries. However, significant volumes were exported as well. After a period of increased export most of the production is now again supplying domestic needs, as the export quotas set by the state authorities were recently cut back. The predominant export markets are now countries such as Iran, Syria, Turkey, the Czech Republic and Poland. The volumes exported to these markets are without exception transported southwards by railway, and eventually further on by ship from Black Sea ports. Some customers are located in Western European countries. To destinations in Western Europe the products are usually carried by rail, and sometimes by boat from St. Petersburg.

The products of Syktyvkar pulp and paper company are much the same as in Kotlas. Today about 50% of the production supplies domestic markets. This is according to the new quota established through negotiation with the authorities. The other half of the production is exported. The main export markets are India and the Far East; i.e. Vietnam, Taiwan and South Korea. Newsprint, cardboard, plywood and chipboard are also sold in the European markets.

Both companies are now converted to stock companies. In Kotlas most of the stocks are held by the company leaders. The workers control a few stocks, while the state is no longer an owner. Syktyvkar pulp and paper company was privatised in 1994. In May 1995 the Russian state held 15% of the stocks. Both companies have also started to split up and sell out related activities such as kindergartens, schools and hospitals. However, these operations are difficult in the present situation. Consequently, the two companies still have 11,000 (Kotlas) and 9,000 (Syktyvkar) employees.

The situation in the international pulp and paper markets improved significantly between our first visit in 1994 and our second visit in 1995. The mass prices had increased from an average of 380 USD/t in the beginning of 1994, to 840 USD/t in the beginning of 1995. When we visited the companies in May 1995 the price level was about 850-900 USD/t. Both companies had during this period increased production, profits were good, and they had an optimistic view of the future.

5.4 **River transport of round timber**

Since 1990 significant changes in the flow of round timber has taken place on the river system of Dvina. The changes can be characterised by the following:

- dramatic fall in transported volumes between counties/republics
- less dramatic fall in transported volumes within counties/republics

The fall in transported volumes between counties/republics can be illustrated by the flow of timber from the republic of Komi to the city of Archangelsk. In the 1980's large quantities of round timber (80,-100,000 tons a year) were transported from Syktyvkar to Archangelsk. This was mainly to ensure the pulp and paper industry in Archangelsk a sufficient supply of timber.

However, this flow of timber was a result of federal industry planning. Today, according to the constitution of 1993, the control of the timber resources is delegated to the regional authorities. Furthermore, the supply of timber has been significantly reduced over the last years, because of decreased logging activity[1].

Consequently, the timber resources of the republic of Komi are now allocated for industrial processing within the republic. Since 1990 the supply of timber from Komi to the industry of Archangelsk has come to a complete stop. The situation in Kotlas is parallel. In earlier years Kotlas pulp and paper company used to get about all its timber from Komi. This supply has now ended, and the company has to be supplied by the near-by areas. The development described above is a major reason for the dramatic fall in the timber volumes transported on the Dvina river during the last years.

The same effect can be observed within the counties/republics, and on a more local basis. Within the county of Archangelsk the timber supply situation is better for the Kotlas industry in the southern part of the county than for the Archangelsk industry further north. The supply of timber is simply better in the Kotlas area, as is the energy supply.

Dvina and the connected rivers are, however, still important transportation corridors from the regional logging areas to the local industry. This can be illustrated by the following figures. After years of reduced volumes the Northern River Shipping Company in 1994 still transported 1,5 mill. m^3 timber to the city of Archangelsk. In 1995 this volume will probably fall to about 1,1 mill. m^3, of which 60,000 m^3 is supposed to be transported on the Pinega river. In the republic of Komi 120,000 m^3 of timber was during the month of May 1995 shipped to Syktyvkar from the near by area, mainly on Wytschegda, from Pomosdino, Storochewsk and Ust-Kulom. These volumes were mainly timber for the pulp and paper production of the Syktyvkar timber company.

5.5 River transport of timber based products

Another important question is to what extent more processed timber based products are or could be transported down Dvina, for export from Archangelsk to foreign markets.

[1] As described in project III.02.1 the decrease in the logging activity is due to reduced availability of timber, and general economic dysfunctions. In spring 1995 it was common that forest workers had not been paid for about 1/2 year. However, according to our information the logging activity was increasing again when we visited the area in May.

To our knowledge no sawn timber, cellulose, paper or other finished products are now being transported from the industry located up the river through the port of Archangelsk. According to the pulp and paper companies in Kotlas and Syktyvkar transportation through Archangelsk to the export markets is not competitive to the alternative routes[2].

An important reason for this is the increased price of river transportation. As a response to reduced volumes[3] the river companies have, in contradiction to normal market behaviour, increased the prices to compensate income loss. Consequently, they have squeezed themselves even more out of business.

According to the Kotlas company representatives the price of the NSR transportation route via Archangelsk to the West European countries is now about twice the price of the southbound alternatives. Even from Archangelsk city it is sometimes cheaper to reach the European markets by going southwards, than by sending the products along the NSR. This may be illustrated by the transportation costs from Archangelsk to Oslo (May 1995). While transportation cost of round timber along the NSR is 23-27 USD/m^3, the transportation cost through the White Sea channel is 24-25 USD/m^3.

Besides, as described previously, the main export markets of the pulp and paper companies in both Kotlas and Syktyvkar are now located in Eastern Europe, the Middle East and Asia. Consequently, railway transportation southwards, and eventually sea transportation from Black Sea ports, represent a shorter route.

Is this situation likely to change in the future? It might. If the Russian timber based industry is modernised and upgraded, the product quality will rise. If this happens, and the products really catch up with western standards, more finished products are likely to be exported to West-European markets. However, if the products are to be transported from the inland (i.e. from Kotlas or Syktyvkar) through Archangelsk, this route has to be a competitive alternative to the traditional routes through Eastern Europe or the port of St. Petersburg. Today it is not.

A few years ago the inland industry was often instructed to send the products through Archangelsk to the export markets. While much of the round and sawn timber was transported on the river, mass and other processed products were transported by train to Archangelsk. Today the industrial companies choose more competitive transport alternatives.

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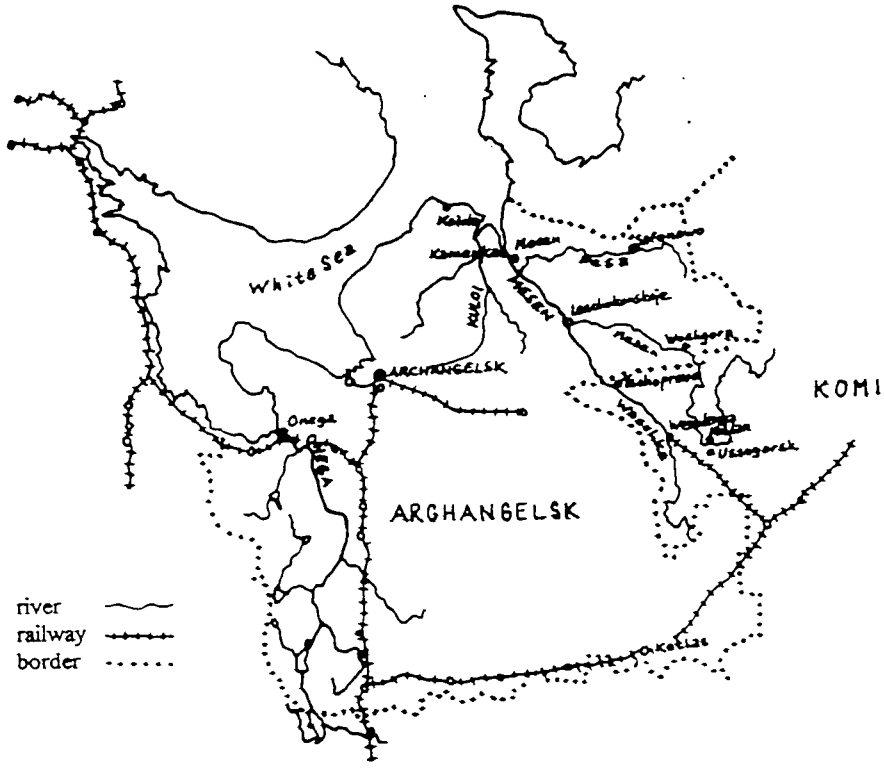
[2] Since there is no transport from Syktyvkar to Archangelsk for the time being, it is not possible to give an exact price for timber transportation on the river. However, the port authorities of Syktyvkar stipulated a price of 20 USD pr. m^3 roundwood from Syktyvkar to Archangelsk (May 1995).

[3] According to the official statistics in Archangelsk, the total volumes transported on the rivers within the county were in 1994 reduced by 64%.

Map 3 The Onega and the Mesen river systems.



6 ONEGA

6.1 Sailing conditions

Onega river flows through the western part of the county of Archangelsk. The mouth of the river is extremely shallow, and it is not possible to sail in this water. Upstream the water is somewhat deeper, but rocks in the river make it unsuited for ordinary cargo transportation.

The town of Onega has no port. Because of the shallow water around the town, both upstream and downstream, vessels can enter the town neither from upriver nor from the White Sea. However, where the railway crosses the river just a few miles south of the town and southwards, passenger vessels are operating.

6.2 River shipping companies operating on Onega

The Northern River Shipping Company is the only company operating on Onega. The activity on the Onega river is organised as a separate division within the company, administered by the town of Onega.

6.3 Forestry and timber based industry along the Onega river

There is no timber industry along Onega, except from the two mills in the town of Onega. These two mills are now owned by the same company.

6.4 River transportation of timber and timber based products

No timber is transported by help of vessels on Onega. Timber is only rafted down the river to the town of Onega. In the 1980's the volume used to be about 1,300 m^3.

7 MESEN

7.1 Sailing conditions

Mesen river and the tributaries Pesa and Waschka covers the northern corner of the county of Archangelsk, but both Mesen and Waschka start in Komi. Mesen, located just inside the river mouth, is the only town along the river.

During the summer season the sailing conditions are acceptable up to Leschukonskoje. Further up navigation is restricted to 2-3 weeks just after the rivers open in April/May.

7.2 River shipping companies operating on Mesen

The Northern River Shipping Company is the only company operating on Mesen. The activity on the Mesen river is organised as a separate division within the company, administered by the port of Mesen.

7.3 Forestry and timber based industry along the Mesen river

A saw mill is located in Mesen town, and this mill has departments in several settlements up the river.

7.4 River transportation of timber and timber based products

Timber is transported down Mesen river to the Mesen town. While logging is a year round activity, the rafting is usually done in about three weeks.

Some of the timber is sawn in the local mill, some is transported for further processing

elsewhere. Only trees of 15-20 meter (25%) are sawn, the rest is used for pulp and paper production.

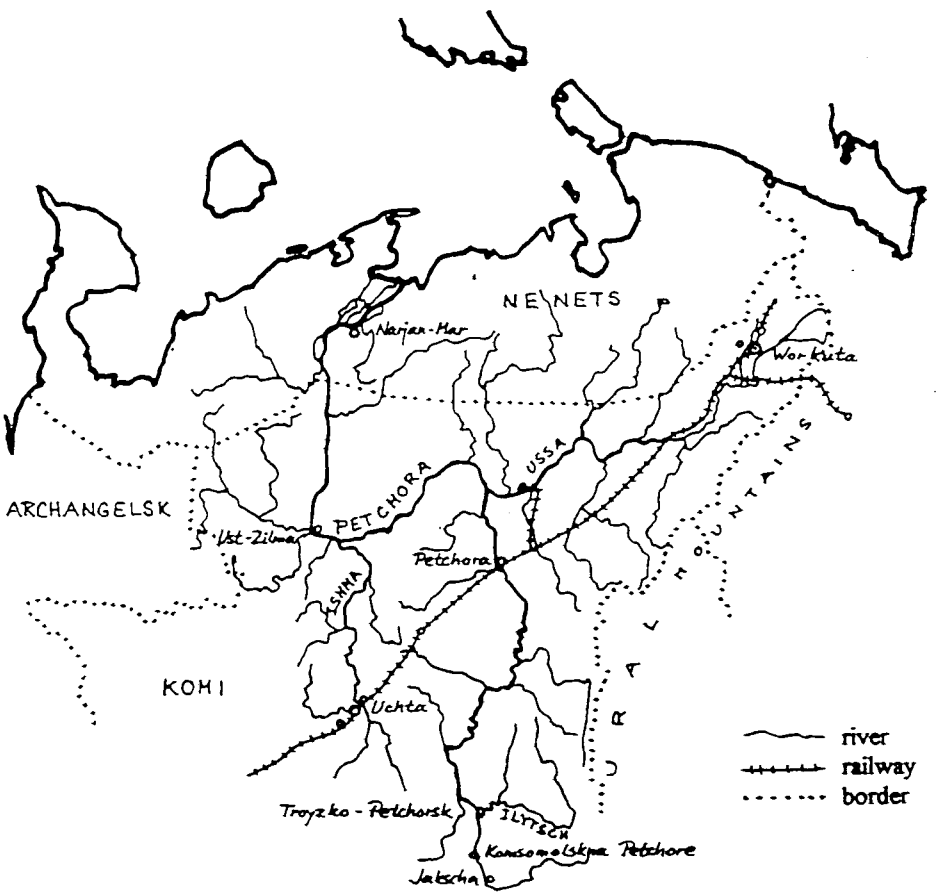
A new railway is planned from Archangelsk to Ochta. If this plan is realised it would have a significant influence on timber transportation on the rivers Mesen and Pinega.

8 PETCHORA RIVER

8.1 Sailing conditions

The Petchora river starts in the south-east corner of the republic of Komi, running north along the Ural mountains, then turning west after passing the town of Petchora, running westwards to Ust-Zilma, then turning north again, passing the border of the autonomous area of Nenets and ending in Petchora Bay after passing the Port of Narjan-Mar.

Map 4 The Petchora river system.



Several rivers are connected to the Petchora river. The most important tributaries are Ishma, which runs through the town of Uchta, Ussa, running through the town of Workuta, and Ilytsch, originating in the Ural mountains. Altogether the Petchora river system covers 60-70 % of the Komi republic, and a major part of the republic's producing forests.

In the spring time the southern part of the river opens up first, in late April. From the time the port of Narjan-Mar opens in late May to about October 20th, the main river system is usually free from ice.

The water level is at its highest just after the ice has gone. In Narjan-Mar the level rises about 6 meters in this period, and in some of the tributaries up to 8 meters.

Only the Petchora river is frequently used for lighter transportation, while tributaries such as Ishma and Ussa are normally too shallow for this kind of traffic. For a couple of weeks, right after the ice has gone, however, it is possible to sail on both Ishma and Ussa. In this short period of time it is possible to transport cargo, for instance, up the Ishma river to Uchta.

In general the shifting conditions in the rivers make it difficult to operate vessels both on Petchora and the tributaries. The vessels operating on the Petchora river have a maximum depth of 1.4 meter.

The main activity of the Petchora River Company over the years has been transportation of gravel from the area south of Petchora town to Narjan-Mar. This trade covered about 90 % of the total cargo volume. Since 1988 the volume of this trade is reduced to less than 10 % of the previous level, leaving 90 % of the fleet capacity unoccupied.

Periodically the Petchora River Company has carried significant volumes of equipment to the oil and gas fields in the Timan-Petchora basin. However, this business is for the time being at a minimum, as no new fields are currently being developed. For more details see the petroleum discussion paper of this part project.

The rest of the cargo transportation on the Petchora river is either timber and timber based products, or consumer goods to the settlements.

The port of Narjan-Mar

Narjan-Mar is located 100 km up Petchora river. The water in the rivers mouth is quite shallow. To ensure access to the ocean a canal is dredged in the middle of river. The harbour is thereby kept available for cargo vessels with a depth of up to 4.7 - 4.8 meter (3000-5000 tons). Since the river is constantly silting up the canal, it is dredged almost every year.

The most important types of cargo passing the commercial port of Narjan-Mar are gravel, building materials, consumer products and timber. Gravel is transported down the river, and is used for stabilising the ground for constructions in Narjan-Mar. Except from the equipment that is transported up the rivers to the oil and gas fields, most of the building materials and consumer goods cover Narjan-Mar's own needs. When it comes to round timber the commercial port is only used for transit. By using a mobile crane timber is loaded directly from the lighters to the cargo vessels.

In 1990 the commercial port of Narjan-Mar was handling altogether 420,000 tons of cargo. In 1994 the volume was reduced to 40,000 tons. The volumes of gravel, building materials, petroleum-related equipment and timber are all significantly reduced. The commercial harbour, which is well equipped, is today handling only 10% of its capacity.

The official prices in Narjan-Mar commercial port were in May 1995:

0.198 USD/m^3 port fee
0.299 USD/m^3 canal fee (inclusive pilot fee)
0.025 USD/m^3 unloading/loading fee

The canal fee makes up 57 % (0.299 USD) of the total port fee pr m^3 (0.523 USD). The shallow water problem is thus maintaining the port prices at a high level. Furthermore, the port authorities have raised the prices recently to compensate for the reductions in volumes. The port authorities underline, however, that the prices are normally reduced significantly through negotiations. Ordinary export tariffs are added.

8.2 **River shipping companies operating on Petchora**

The Petchora River Company carries out nearly all the cargo transportation on the Petchora river system. The company was founded in 1880, for timber export to America. The administration office of the company is located on the river banks in the town of Petchora.

As other Russian river companies the Petchora River Company was in 1994 converted to a stock company. For the time being 25 % of the stocks is owned by the state, the rest by employees, regional funds etc. After three years the shares held by the state may be sold on the open market.

In contrast to the Northern River Shipping Company the Petchora River Company has not been diversified and regionalised. The company has so far kept its monopoly position and control of all transportation on the Petchora River. Only a few special vessels belonging to the geological companies, exploring for petroleum in the area, are operating on their own.

8.3 Forestry and timber based industry along the Petchora river

No pulp and paper company are located along this water system. Several mills are operating along the rivers, but most of the capacity are located in Pechora town or in Narjan-Mar.

The largest mill in *Petchora town* is Petchora Lesprom, with about 2000 employees. The company was associated with the export organisation Severolesexport until 1993, and has thus been exporting round and sawn timber for a long period of time.

Before 1993 Petchora Lesprom produced about 80,000 m^3 sawn timber each year. 10,000 m^3 of this volume was transported down the Petchora river and exported to Scandinavia. The rest was transported southwards by railway.

The company sold about 420,000 m^3 of round timber. Of this 170,000 m^3 was transported down the Petchora River to the Petchora Les mill in Narjan-Mar for further processing. Some was exported by rail to Hungary.

Since 1993 transportation of both round and sawn timber to Narjan-Mar has almost stopped. The republic of Komi has decided that the high quality timber from the areas south of Petchora town should be processed by the Komi timber based industry.

Petchora Lesprom gets most of its timber from the upper part of the Petchora river and the connected river Ilytsch; the villages of Jakscha, Komsomolskna Petchore and Troyzko Petchorsk being important deliverers. The area between Troyzko Petchorsk and Petchora town also supplies Petchora Lesprom with timber.

Today 60% of the timber supply is spruce, 40% pine. Deciduous species are not used at all.

In the town of Petchora there are several mills. Except for Petchora Lesprom the other mills are operating more on the domestic markets. In the near future Petchora Lesprom will probably fuse with another local mill company, called Pechora Lesplav. Petchora Lesprom will then become a company of about 2,200 employees.

The mill Petchora Les is located in *Narjan-Mar*. As described above, this mill used to get large and high quality timber from the Ural area in the southern part of Komi.

After the new regulations stopped this trade, Petchora Les now gets its timber from the area around the tributary Ishma. The area is inhabited only by indigenous peoples. The timber is smaller than the Ural timber, but the quality is high. There are no mills along Ishma, and since it is inconvenient to transport the timber upriver, it is sent to Narjan-Mar.

In recent years the local people have been logging yearly about 40,000 m^3 for Petchora Les. The timber is rafted down Ishma in June and July, and transported on lighters down the Pechora river to Narjan-Mar from the end of July til mid October. The area can produce 70,000 m^3 a year. However, the logging activity is dependent on financial support from the Komi republic to the indigenous people in the area.

Pechora Les has a capacity for processing 160,-170,000 m^3 of large timber (like the Ural timber), and 100,000 m^3 smaller timber (like the Ishma timber). In 1994 the company received 40,000 m^3 of timber from the Ishma area.

Pechora Les is still a member of the export organisation Severolesexport. The company has been exporting sawn timber to England and Holland from the beginning of this century, and is still supplying the old customers as well as new ones. Most of the timber export is transported by the Northern Shipping Company. Foreign vessels have only occasionally been involved in this trade.

Of the total production 30 % has an export quality, 20 % has a quality accepted in the domestic and the Eastern-European markets, 20 % has a quality which can only be sold in the local market, and the last 30 % is sawdust or waste. A few years back the waste was transported to the pulp and paper industry in Archangelsk, but this trade has now stopped because it is not profitable.

Pechora Les, which has 400 employees, was converted to a stock company in 1993, and from 1995 the state no longer holds shares in the company.

8.4 **River transportation of timber and timber based products**

To sum up the present situation of the timber transportation on the Petchora river system: while the rivers are still important corridors for timber transportation within both the republic of Komi and the autonomous area of Nenets, the transportation between these two administrative regions has become seriously restricted.

To the town of Petchora large volumes of high quality timber are transported from the productive areas around the upper parts of the river system. From Petchora town most of the round and sawn timber are sent by railway northwards to Workota, southwards for further processing within the Komi republic, or southwards for export.

When exporting to European markets railway is normally preferred. River transport to Narjan-Mar, and from here by boat, is for the time being not a competitive alternative, because of higher costs and longer time due to cargo transfer in Narjan-Mar. The cost of transporting timber only from Troizko Petchorsk to Narjan-Mar (1490 km) is now about 6 USD/m^3.

Today, most of the timber transported down the Petchora river to the port of Narjan Mar originates from the tributary Ishma. To the Petchora Les mill in Narjan-Mar 40,000 m^3 of round timber was in 1994 received from the areas around Ishma, and 15,-20,000 m^3 was shipped to Archangelsk or to export markets.

In 1994 only 15,000 m^3 of round timber and 2,000 m^3 of sawn timber passed the commercial port. These volumes were transported for Petchora Lesprom and came from the areas south of Petchora town. All of these volumes were sent to the timber industry in Archangelsk.

9 CONCLUSIONS

Based on this report a few general conclusions might be drawn:

- The transportation of round timber, from the productive forests in the republic of Komi to the timber based industry in White Sea and Petchora Sea ports, has decreased dramatically over the last few years. This change in the timber flow pattern is mainly caused by the Constitution of 1993, which gave the regional authorities increased control over their own natural resources. In accordance to the new regulations the republic of Komi has decided to process more of their own timber resources, and to sell the surplus of round timber to the best paying markets. There is reason to believe that this new policy will be permanent.

- Export of round timber from Komi to the markets in Europe and elsewhere are usually transported on railway southwards, and eventually by boat from Black Sea ports or the port of St. Petersburg. River transportation to the Arctic ports, and further transportation by boat, is normally not a competitive alternative to the railway. To compensate for reduced volumes transported on the rivers, the river shipping companies have increased their tariffs, and thus squeezed themselves even more out of the market. Whether or not river transportation of round timber could be developed as a competitive alternative in the future, is a question that cannot be answered on the basis of the information made available during this research work.

- After the collapse of the Soviet Union the timber based industry of the Russian North has been searching for new markets for their products. Export is still restricted by quotas set by the Russian state. As previously internal markets are reduced, or have become external, however, significant changes in the flow of sawn timber and timber based products have occurred. As a general rule unprocessed or semi-processed products (round timber, sawn timber and mass) are exported to West European countries, while lower quality timber and more processed products are exported to East European countries, North Africa, Middle East and South Asian countries.

The shortest and cheapest way of transportation from the republic of Komi to these main markets for processed timber products is by railway southwards, and eventually by boat from Black Sea ports. Consequently the Northern Sea Route does not normally represent a competitive alternative of transportation for this kind of trade.

In the future, if the Russian timber based industry is modernised, and the product quality gradually satisfies western standards, it is likely that more timber based products will be exported to Western markets. However, it is not possible, on the basis of the present information, to estimate whether or not NSR could be developed as a competitive transportation alternative to these markets in the future.

- In the short run it is not likely that international shipping companies will contribute to developing competitive river operations on the rivers Dvina, Onega, Mesen and Petchora, linking the Russian inland to the northern harbours and the NSR. According to present regulations the existing Russian river shipping companies have exclusive rights to operate on the rivers. In 1996-1997 foreign investors will probably be invited to buy minor shares in these companies. Under the present circumstances, however, this option is hardly tempting. In the longer run, if the river transportation is deregulated, this situation might change. But still, competition from other transport alternatives, and short sailing season and difficult sailing conditions in these rivers, are considerable barriers to economic success for river transport.

Oil and gas in the north-western part of Russia

By Vigdis Nygaard,
FINNUT

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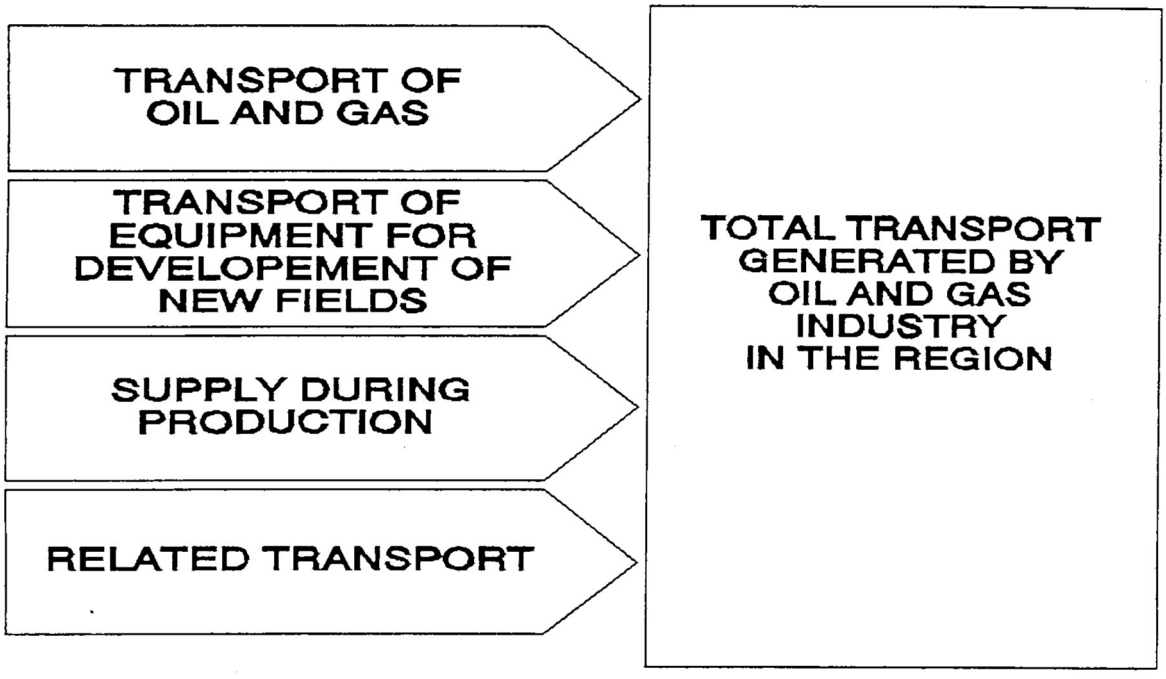
MAPS

1. INTRODUCTION

The purpose of this paper is to get a general view of the total transport generated by the oil and gas industry in the analyzed region. Since the production of oil and gas is limited in the near coast area, and development of the enormous resources offshore only commence some time in the foreseeable future, this paper can do no more than give some indicators on total amount of transport. The aim is not to give figures of total freight, but to point out some regional characteristics for the development of oil and gas industry in the area.

A model for the total transport along the Northern Sea Route will be made by the following variables: Transport of oil and gas, crude and products, transport of equipment for development of new fields, transport of supply during production and related transport.

Data for this report were mainly collected during a trip to Arkhangelsk County, Nenets Autonomous Area and the Republic of Komi in May 1995.



2. CONCLUSION FROM THE LAST REPORT

One field will be in production on the Norwegian central shelf when Norne starts to pump oil in 1997. The Snøhvit gas field in the Barents Sea can also be in production in the next century if buyers are found. On the Russian side, the gas fields in Yamal will be of first priority, and second the Prirazlomnoye oil field in the Pecora Sea. Shtokmanovskoye gasfield in the Barents Sea will only be developed after the needed investments are made in the first mentioned fields. The priority is made by the Government as production is an important source of hard currency earnings for the budget. The onshore fields in Nenets will be developed in cooperation with foreign companies, but the progress will depend on the general political climate for foreign companies related to production-sharing agreements and investment policy.

The extension of the mentioned petroleum activities in Northern Russia will cause an important transport stream along the Northern Sea Route. Transport of petroleum products out of the region to export markets in Europe, and transport of equipment to the sites will constitute an essential number of vessel calls. The extent of this transport will depend on the priority between pipeline solution or shipment solution. We believe that transport of petroleum products will be the most important transport along the Northern Sea Route in the next century.

3. CURRENT FIELDS AND COMPANIES

3.1. REPUBLIC OF KOMI

The republic of Komi is one of the richest oil and gas regions in Russia. There are approximately 1.3 billion tons of recoverable oil reserves and 350 billion cubic meters of natural gas in the region *(source: RPI Feb.95 p.46)*. But, as much as 40 % of the resources have already been taken out. Most of the fields have been in production for several decades, and resources are about to run out. All the Russian companies in the republic experienced a drop in production from 1993 to 1994. In order to secure additional funding and equipment for development of new fields, the regional authorities and companies have invited foreign companies to form joint ventures. These joint ventures constitute an essential part of the production in the republic.

A further expansion of oil and gas in the republic will require enormous investments in the development of new fields and new infrastructure.

3.1.1. RUSSIAN COMPANIES IN THE REPUBLIC OF KOMI

Komineft / Komitec Holding Company

Komineft has as a stateowned regional company dominated the extraction of oil in the republic. However, the processes of privatization and regionalism have forced through new forms of ownership and thereby changing the status of the company.

The process is also in accordance with the presidential decree of April 1995 where oil companies are required to change their structure. As a result, Komineft has together with Kominefteproduct and Ukhta refinery formed a vertically integrated joint-stock company called Komitec Holding Company. The stock issue of the holding company (formed in November 1994) is not yet fully solved. At the moment, 51 % of the stocks are in the hands of the government. There have also been negotiations about the incorporation of other state-owned companies in north-west Russia, for instance Arkhangelskgeologia, Yaroslavl Oil Refinery and Murmansknefteprodukt.

Production:	
1993:	9.263.260 t
1994:	5.066.400 t
Export:	
1993:	1.512.600 t
1994:	721.700 t

The first months of the holding company were quite profitable. The refinery contributed to most of the revenues with an annual production of 6 million tons (Komineft). Kominefteprodukt showed a minor profit while Komineft had an enormous deficit.

Komineft is operating most of the oil pipelines in the republic. Most of them are in bad condition, and in need of repair. The area around Usinsk is the worst, with frequent leakages. The November 1994 accident has so far been the most serious, but Komineft and foreign environmental organizations have not disagreed as to the total amount of spills. The 43-kilometre Vozey-Usinsk pipeline build in 1974, belongs to the Ushinsktermneft oil- and gas-producing board, a subsidiary of Komineft. Komineft will lead the international clean up of

the oil spill, and has chosen Australian Emergency Services Foundation as the main contractor for repair work on the Vozey-Ushinsk pipeline. AESF plans to use 70 % of the credit for repair work and 30 % for laying a new arterial pipeline between Kharyaga and Usinsk.

Severgazprom
Severgazprom, which was founded in 1968 to develop the Vykuts gas-condensate field, is a regional gas production company under the state controlled Gazprom. The company (including its subsidiaries) controls all gas activities in the north-western regions. The main office is situated in Ukhta. Including all 30 departments, the company employs 16 000 workers.

Severgazprom's main activities :

* development
* transport
* gas and gas-condensate processing

We have no exact figure of the production of gas by Severgazprom. Due to its being heavily integrated into Gazprom, separate figures are not available.

Furthermore, Severgazprom is active in Nenets Autonomous Area. The company has obtained a licence for Layavozhskoe oil and gas condensate field, and has signed an agreement with the federal and local geological departments to develop the deposits. The field is expected to be in commercial production by 1999. Earlier, Severgazprom was awarded a licence for the Vasilkovskoye gas condensate field, where drilling activities have started. The enterprise is expected to apply for licences for additional fields in Naryan-Mar: Vanepvisskoye, Kumzhunskoye, and Korovinskoye *(source: RPI, May 95)*.

Ukhtaneftegazgeologia
Ukhtaneftegazgeologia is a regional exploration company, a joint stock company and Roskomnedra enterprise. The enterprise was active in Nenets AA until 1994, but is now operating solely in the Republic of Komi.

Production:	
1993:	t
1994:	t
Export:	
1993:	203 800 t
1994:	179 700 t

The total production of Ukhtaneftegazgeologia is unknown, but the company has a limited export made from testing of new fields and overhaul of old wells. About 500 people are employed in the company's three functions:

- base of supplies
- expedition
- repair

JOINT VENTURES IN THE REPUBLIC OF KOMI

Of the oil produced in the Republic of Komi in 1994, about 40 % was made by joint ventures. This figure demonstrates the importance of foreign companies in the Republic.

Nobel Oil

The venture, formed in October 1991, runs several oilfields in Usinsk region.
Partners: Komineft 47.5 %, Ukhta refinery 5 %, Marc Rich (Swiss) 47.5 %
Investments so far: 65 million dollars

Production:	
1993:	1.18 mt
1994:	1.40 mt
Export:	
1993:	299.222 t
1994:	181.400 t

Komiquest

Komiquest is currently overhauling 60 fields near Usinsk. The joint venture was established by Komineft and its subsidiary Usinskneft each owning a 25 % share while Quest Petroleum Ltd (Austria) is the foreign partner with a 50 % share of the stocks.
Investments made so far: 20 million dollars

Production:	
1993:	107.600 t
1994:	190.300 t
Export:	
1993:	70.800 t
1994:	145.000 t

KomiArcticOil

The JV operates the Vozeyskoye field, and has recently started development of the Verkhne-Vozeyskoye field 100 km north of Usinsk. The estimated reserves are 40 million tons. Eight new wells have been drilled, 63 repaired, and 11 wells have been overhauled.

The JV was registered in November 1991
Russian partners: Komineft 25 % and Ukhtaneftegazgeologia 25%.
Western partners: British Gas Exploration and Production 50 %

Production:	
1993:	651.600 t
1994:	564.900 t
Export:	
1993:	710.600 t
1994:	608.000 t
Incl. export for other	

Gulf Canada Resources Ltd initially owned 25 % of the stocks, but left the venture in March 1995, selling its ownership to British Gas. The reason for leaving the venture was explained to be problems with transport. As for other joint ventures, the pipelines in Komi are a bottleneck for stable transport. This affected the venture's export which were heavily reduced during 1994. Most of the exports are settled through a swap agreement with Komineft which sends crude oil to the Yaroslavl refinery.

The venture secured a EBRD loan to finance the construction of a central pumping station, a compressor station for gas injection and several pipelines. There are also plans for a gas-processing plant.
Investments in the JV: 120 million dollars

Amkomi
Partners: Aminex (UK), Pechornipineft, Komilestopprom

Production:	
1993:	52.000 t
1994:	85.200 t
Export:	
1993:	15.600 t
1994:	110.700 t

Investaneft
Partners: Nord Resources (USA), Nafta B (Belgium), Andrew Trading International (Netherlands) and Komitermneft

Production:	
1993:	49.000 t
1994:	61.000 t
Export:	
1993:	80.000 t
1994:	50.000 t
Incl. export for other companies	

Britan
Partners: Ukhta refinery + Russian Oil Company 67 %, UTRO Ltd. (UK) 33 %

Production:	
1993:	211.900 t
1994:	61.000 t
Export:	
1993:	0 t
1994:	50.000 t

JOINT VENTURES IN THE REPUBLIC OF KOMI

JV	RUSSIAN PARTNER	FOREIGN PARTNER	PRODUCTION 1993	EXPORT 1993	PRODUCTION 1994	EXPORT 1994
KomiArcticOil	Komineft 25 % Ukhtanneftegasgeologia 25 %	British Gas 50 %	651.6	710.6	564.9	608.0
Komiquest	Komineft 25 % Usinskneft 25 %	Quest Petroleum (Austria) 50 %	107.6	70.8	190.3	145.0
Nobel Oil	Komineft 47,5 % Ukhta refinery 5 %	Marc Rich + Co.AG (Switzerland) 47.5 %	1777.8	299.2	1404.4	181.4
Amkomi	Komineft	Aminex (Ireland)	52.9	15.0	58.2	110.7
Bitran	Ukhta refinery + Russian Oil Company 67 %	UTRO Ltd.(UK) 33 %	211.9	0	61.0	50.0
Investanaft	Komineft 6 Russian Companies	Nord Atlantic Resources(USA) Nafta B (Belgium) Andrew Trading (Neth.)	48.5	57.9	61.1	0

3.2. NENETS AUTONOMOUS AREA

Nenets Autonomous Area has enormous reserves of oil and gas, but because of climatic conditions and lack of infrastructure, a very limited part the wealth has been developed. The area is looked upon as one of the most interesting in Russia for foreign investment.

75 fields have been tested in the area, of which 64 for oil, 6 for oil-condensate, 3 for gas-condensate, one for gas, and one for associated gas.
This testing has shown the following reserves:

- 2.4 billion tons of oil
- 1.17 trillion m3 of gas
- 44 million tons of gas-condensate
- 133 billion m3 of associated gas

(source: 68 parallel no.1)

Only a small part of these fields is ready for development, and because of the vast amount of resources in the region and in Russia as a whole, there is no immidiate urgency. In addition to the most likely fields soon to be developed, Prirazlomnoye and the TPC-fields, there are also the offshore fields: Pomorskoye, Kolokomorskoye, Khodovarkhinskoye, Severnoye Gulaevskoye. A tender open to foreign companies is also soon expected to take place for the Khorey Ver fields onshore.

3.2.1. RUSSIAN COMPANIES ACTIVE IN NENETS AUTONOMOUS AREA

Arkhangelskgeologia (AG)

Arkhangelskgeologia is a regional geological enterprise. The company "inherited" the exploration of Nenets when the Komi enterprises were forced to leave the Area. Apart from the production from fields at Kolguev Island, AG has a limited own production from geological explorations.

Production:	
1993:	t
1994:	t
Export:	
1993:	108.000 t
1994:	69.400 t

AG has the right to take out a licence for a number of oilfields in Nenets. The company is taking part in the Polar Light JV, and negotiates with Timan Pecora Company, a consortium of foreign companies. AG is interested in developing fields on its own, but lacks financial resources. AG is also active in the planning of transport solutions from the Timan Pecora fields.

AG became a subsidiary to Rosneft in March 1995. This makes the company more powerful in negotiation with foreign partners. As a Rosneft company, AG is more likely to get support from the Ministry and Government.

Rosneft
Rosneft was formed as a state enterprise in 1993. The status of the company was vague until a decree in March 1995 made Rosneft into a vertical integrated oil company with 42 subsidiaries. All the subsidiaries of Rosneft produced 35 million tons in 1994. Rosneft's refining capacity is 44 million tons per year.

Rosneft will have the right to sell Russia's shares of oil in production-sharing agreements (PSA), and will also take part in several PSA- projects. Today, all foreign companies must deal directly with Rosneft, and not with various small companies and Ministries.

Rosshelf
Rosshelf was founded in 1992 as a result of a Presidential decree giving Gasprom 51 % of the shares. Rosshelf immediately obtained the right to develop Shtokmanovskoye offshore gas-field and Prirazlomnoye offshore oil field. Giving Rosshelf the responsibility, the Government made sure Russian interests were favoured and regional employment was secured. A programme for converting the military industry into oil and gas industries, was one of the most important motives.

3.2.2. EXISTING JOINT VENTURES IN THE NENETS AUTONOMOUS AREA

Polar Lights
Polar Lights was formed in 1992 as a 50/50 joint venture between Arkhangelsgeologia and Conoco to develop the Ardalin field in central Nenets. The field is not so big, and the annual output is limited. However, the venture obtained special Government support, having experienced minor bureaucratic problems in the build-up phase. Production start was in August 1994.

Production:	
1994:	346 000 t
Export:	
1994:	323 000 t

After Arkhangelskgeologia became a subsidiary of Rosneft in March 1995, Rosneft took a stake in the Polar Lights JV. AG has transferred 20 % of its shares to Rosneft which will invest money in the venture.

Prirazlomnoye
Prirazlomnoye offshore field in the eastern part of the Pecora Sea, was discovered in 1988. The field contains 100 million tons of oil, and a substantial amount of gas-condensate. 5 wells have been drilled in shallow water of 20 m depth. According to a feasibility study, the total cost of development will reach 1.9 billion USD. Production is expected to start in 1999, and will reach an annual production of 4 million tons of oil and 600 billion m3 of gas.

Rosshelf is responsible for the development of the field, and has founded a joint venture with the Australian company BHP-Hamilton. Gazprom is involved as the main share-holder of Rosshelf. The geological testing is carried out by Murmanskgeologia, and the US companies Brown & Root and Halliburton are contracted for feasibility studies, equipment and transport. A production sharing agreement between Rosshelf and BHP has not yet been signed. However, the signing is expected to take place as soon as the PSA-law is adopted, probably by the end of 1995. The profit is expected to be shared 50/50.

Expected annual production:

Oil: 4 million t
Gas: 600 billion m3

Pecormorneft

Pecormorneft was formed in April 1995 as a 49%-51% Finnish-Russian JV. Partners are Neste Oil, Kværner Masa Yards shipbuilding company, Soyozmorgeo production association, Severmorneftegeofizika, Morgeofizika research institute, Maritime Arctic Geological expedition (MAGE Inc.) and Nenets Autonomous Area administration.

The aim of the venture is to explore oil resources in the near offshore Pecora Sea Area, and the companies now await the announcement of tenders. They are interested in Pomorskoye, Kolokolmorskoye and Khodovarikhinskoye fields. The last block is located onshore by the Pechora Sea, and the other two further out on the shelf. One exploration well has been drilled in Pomorskoye, and gas condensate was found.

Before any serious development studies are made, a planned large-scale exploration program will make accurate reserve estimates. Production will start in year 2002 at the earliest *(source: ANR, Vol 11 and RPI July/August)*.

3.2.3. JOINT VENTURES/PRODUCTION SHARING AGREEMENTS UNDER NEGOTIATION

TPC-fields

The TPC-territory in east-central Nenets AA consists of 11 fields with a proven recoverable reserves of 306 million tons. The main fields are Varandeiskoe, Toraveiskoe, Titov and Roman Trebsa. The production sharing agreement between Russian authorities and the four foreign companies in the TPC consortium (Texaco, Exxon, Amoco and Norsk Hydro), has been hampered by several delays and disputes *(see 1994-report and Olsen for more details)*. Arkhangelskgeologia has demanded a substantial role in the consortium without contributing any capital to the project. After AG became a subsidiary of Rosneft in March 1995, the participators have reached an agreement. Rossneft will put money into the project, and has taken over 20 % of the shares. AG will be the general contractor responsible for test-drilling of 45 wells *(source: RPI, June 1995)*. Total costs of the development of the fields in a 50 year period is calculated at 35 billion USD.

Total
Total wants to carry out a development project at the Kharyaga oilfield in the southern part of Nenets. Komineft was first appointed as the Russian partner in the project, but was replaced by Rossneft when the regional oil companies were forced back to their home regions.

Total and the Russian side have been given preliminary approval of a draft agreement by Expert Council of the Russian Federation Government. Production sharing agreement for the 2nd and 3rd objects are under consideration, and changes in the agreement will be made after the adoption of the PSA-law. Investment in the project is expected to reach 1 billion USD *(source: RPI April 1994 p. 54).*

3.3. MURMANSK COUNTY

Total recoverable reserves in the Russian part of the Barents Sea are estimated at approximately 3 billion toe. Currently, there are no onshore or offshore fields in production in Murmansk County or in the Russian part of the Barents Sea. Tests in the Barents Sea have revealed an enormous amount of gas. Shtokmanovskoye, described below, is the most promising field and the first to be developed. However, because of the vast total reserves of gas in Russia and the problem of pushing too much on the world marked, thereby pushing prices down, the inclination to develop other promising fields in the area, is reduced.

Arktikmorneftegazrazvedka
Arktikmorneftegazrazvedka (AMNGR), a geological offshore enterprise, operates some minor fields at Kolguev Island. The figures refer to production exclusively from these fields. An export terminal at the island is administrated by the company together with Arkhangelskgeologia. AMNGR has the main responsibility for exploration in the offshore area.

The company was also active in the technical preparations for Shtokmanovskoye before the "Arctic Star" broke down.

Production:	
1993:	39 000 t
1994:	38 000 t
Export:	
1993:	34 500 t
1994:	0 t

Shtokmanovskoye
Shtokmanovskoye gas field in the Barents Sea was discovered in 1988, and lies 600 km north-east of Murmansk. In 1989, foreign companies were invited to participate in the project, and formed "Arctic Star" *(see 94 report)*. They were all forced to leave the project after investing a lot of money when Rosshelf was founded and was assigned the right to develop the field. The field is currently not in production, and the Russian licence holder, Rosshelf/Gazprom, has problems getting the necessary financial investments to start the development. After a long

period of standstill, a letter of intent was signed with Neste, Conoco, Norsk Hydro and Total in September 1995. The companies will complete a feasibility study within a year.

Expected annual production from 2003:

50 billion m3 gas

700 000 tons of condensate

The expected total invesment in the project is a figure up to 20 billion USD. Latest information update states that the first wells will be drilled in 1996 with a production start earliest in 2003. The field contains 2500 billion m3 of gas, making it the biggest gas field in the world. With an annual production of 50 billion m3 of gas, the field will be in production for at least 30 years *(source: Sovjetsky Komsomolets, May 28, 1995).*

4. GENERAL OBSTACLES OF EXPANSION OF THE OIL AND GAS INDUSTRY IN THE REGION

The use of the Northern Sea Route for transport of equipment, crude oil and oil and gas products, will depend on the progress of the development of new fields. Chapter 3 has shown that the region is rich on resources not yet developed, and there are several arguments for such a condition.

4.1. JURIDICAL

Due to unclear juridical conditions, the activity of existing JVs and the willingness to form new ones, have been moderate. Pivotal legilation with substantial effect on the working conditions has not yet been passed, and western companies are unwilling to risk a cooperation agreement liable to be altered or deemed invalid by juridical changes. The most important laws waiting to be passed are:

- Law on Production Sharing Agreement
- Law on underground resources
- Law on oil and gas
- Law on the continental shelf

The problem is not only a legal vacuum, but also the fact that the existing laws are mutually inconsistent. Foreign companies often have problems knowing which laws privail, and which are secondary. A complete accordance of the laws will only take place when all are revised.

The President may (and does quite often) change the juridical position by passing decrees. The decrees can be passed immediately without confirmation and discussion in the Duma. This fact causes an element of instability for both foreign and Russian companies.

4.2. ECONOMIC - LACK OF RUSSIAN CAPITAL

The oil and gas industry in Russia has an enormous need for investments for reconstruction, infrastructure, development of new fields and new technology. The Russian government and companies are aware of the need for foreign investments in developing the oil and gas industry. At the same time, decision-makers are exposed to pressure from the public to:

- secure employment in oil and gas related industries
- secure employment in converted defence industries
- give Russian oil and gas companies priority
- avoid foreign companies taking out enormous profit

The need for foreign capital and knowledge will often be in conflict with internal economic interests.

Several examples can be made of Russian companies obtaining licences for fields without sufficient capital to develop them (Rosshelf/Shtokmanovskoye). The decision (by Presidential decree) to give Rosshelf the rights to Shtokmanovskoye and Prirazlomnoye, was a means of securing employment for the converted defence industry in Northern Russia and keep control of the resources in Russian hands.

4.3. UNSTABLE POLITICAL SITUATION

Some of the important elements liable to affect the stability of the political situation i Russia will be mentioned. Most important are:

- Regionalism
- Parliamentary composition
- Presidential election

Regionalism[1] has been a consequence of abrupt administrative and political structures on both federal and regional levels. Conflicts have arisen

- between different administrative levels
- between minorities and federal/regional administration

The regions have utilised the weak federal power to promote own economic, political and juridical power. Command over own resources and the economic utilisation of them, have been used as motives for a more independent position. This is most visible among the oil and gas rich regions whose wealth Moscow is so dependent on.

The awareness of minority rights and the possibility to maintain them, has expanded among

[1] Here referred to higher degrees of regional self-government within the Russian Federation.

the indigenous people in Russia in recent years. Minorities must be taken into account in areas with pastoral traditions. In our analysis region the Nenets Autonomous Area finds itself in such a situation. The indigenous people are dependent on utilising the tundra for reindeer pasture, and pipelines crossing their routes may damage nature and the cultural traditions. Pressure on local and regional administration can stop the development of oil and gas fields in such areas, or a substantial amount of compensation from oil and gas companies can be demanded. Funds have already been established for social welfare and raising of the living standards among the indigenous peoples. Though this will have a positive effect on the people, some companies are accused for buying goodwill. The Nenets people and other indigenous peoples in the area are not so well organised to constitute an effective pressure group.

Since the Duma passes laws affecting the conditions for oil and gas companies slowing down or accelerating the development of new fields, the political composition of the parliament has become important. The last years' problems of getting the important laws adopted, is a consequence of a minority policy with the need to compromise. An example can be mentioned: The voting result of the third reading of the PSA (production sharing agreement) legislation was marginal with 51.6 % of the votes in favour, 9.1 % against and 38.9 % abstained. The political parties/groups in favour of the law were Yabloko, Russia's Choice and New Regional Policy. A majority of the Communist Party deputies and a part of the Liberal-Democratic Party voted against. These two parties, together with the Agrarian Party, also had substantial numbers of abstentions.

The parliamentary election in December 1995 can make changes in the Duma composition and thereby alter the balance between the blocs. A better election result for the Communist Party and The Liberal Democratic Party could give the left-wing and right-wing opposition the majority of seats, an event that would probably worsen the conditions for oil and gas companies, both foreign and Russian.

The presidential election (set to June 1996), will also be important for the stability of the oil and gas policy. Of the already known candidates Zhirinovsky, Lebed and Zyuganov are all elements of instability, while Yeltsin and Yavlinski are elements of continuity.

4.4. POLITICAL PRIORITIES

Central political priorities affect the development of new fields with their ability to:

- set the priority list for development of fields
- choose open or closed tenders
- give Russian companies advantages over foreign

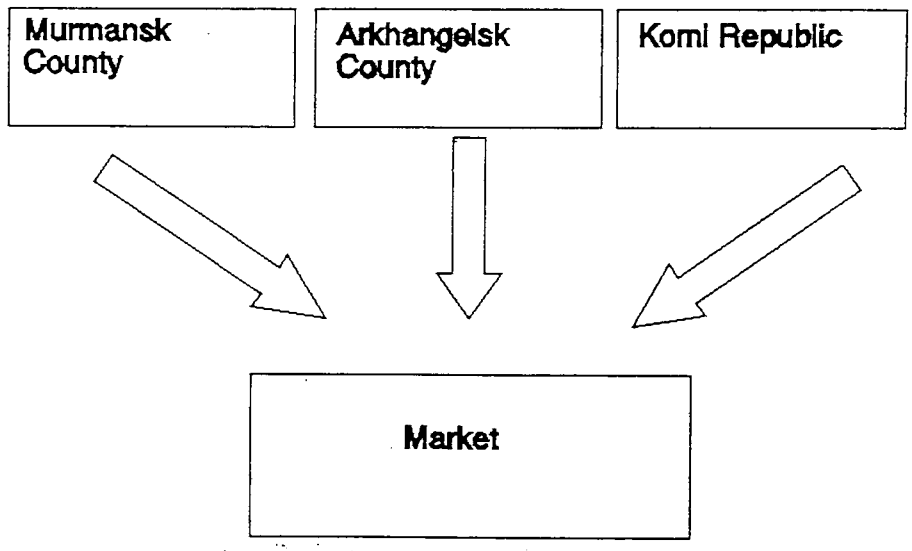
Political priorities are influenced by public opinion and strong pressure groups. One such group leading political positions in the Duma and the Regional Assemblies consists of managers from oil and gas companies.

The Russian government has presented a program for the exploration and development of fields in the Barents and Pecora Seas. The program underlines that the role of foreign investors will be limited to the supply of technology. Russian companies, and especially Gazprom and Rosshelf, will control the new fields where the amount of resources are known to be gigantic. Tenders for the unexplored fields with possibly difficult conditions, will be opened to foreign investors. Russian interests in these projects will be secured by the formation of joint ventures between Russian and foreign companies. However, Rosshelf has demanded that Russian companies will still control these ventures by taking up to 75 % of the profit. Such a profit sharing will demand larger investments from the Russian partners in the ventures.

5. TRANSPORT SOLUTIONS FOR CRUDE, AND OIL AND GAS PRODUCTS

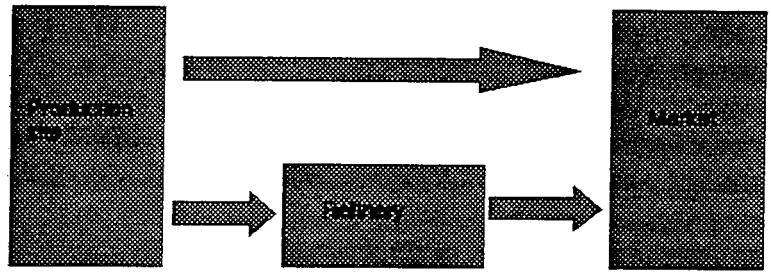
In this chapter, a regional model for transport will be worked out by presenting the main transport solutions for fields in production and fields under planning. Each county/republic will be described separately, but some of the infrastructure is also developed to link the regions together.

Figure 1 Regional studies of transport solutions to the market



Main emphasis will be on transport of crude along the NSR directly to the market, but plans to construct LNG-plants, methanol factories and oil refineries along the coast in our region, will also involve transport of crude to the factories and oil and gas products from the factories to the market. This will be quite important for the total transport along NSR.

Figure 2 Direct and indirect transport to the market



5.1. FROM ARKHANGELSK COUNTY / NENETS AUTONOMOUS AREA

Apart from a limited amount shipped from the Kolguev Island, there ia no regular sea transport of crude oil and gas from the county. The few onshore fields in production are connected to a southbound pipeline through the Republic of Komi, and the gas field Vasilkovskoye is connected to Naryan-Mar for local use.

The giant planned development of Prirazlomnoye, the TPC-fields and other onshore fields in Nenets, have begun detailed planning of different sea transport alternatives.

Northern gate

A group of foreign and Russian companies have worked together for some years on the so called "Northern gate project" to find a reasonable transport solution for the onshore and offshore fields in Nenets. Companies involved in the project are: Norsk Hydro, Amoco, Exxon, Texaco, Dupont Co unit Conoco, Neste Oy, BHP/Hamilton, Rosshelf and Arkhangelskgeologia. The aim of the project is to use the NSR to transport crude oil by tanker to the export market. The advantage of the project is that companies will be independent of the pipeline-system of Transneft, and have more control over increases in expenditure. A sea-transport solution would require huge investments in terminals and building of specially constructed tankers. The costs of running the facilities would probably be cheaper than a pipeline solution[2].

[2] Comment from the reviewer: This is not discussed in more detail nor related to other projects /publications on this question. From the author: Se page 93-95 in Høifødt, Nygaard & Aanesen, 1995.

Four sea-based export routes have been under consideration for the onshore fields. A terminal can be located by the sea in Varandey, Indiga and on Kolguev island. I fourth solution is an open water terminal west of Kolguev island.

BHP/Hamilton, partner in the development of Prirazlomnoye offshore field, has been active in the planning of Northern Gate. However, the company has made its own transport study. The output from Prirazlomnoye will be enough to run a transport solution on their own. The most likely option is a direct loading to ice classified tankers on the site with reloading to super tankers in open ice-free waters.

A single terminal solution is not enough to serve both offshore and onshore fields in the area, so more terminals must probably be built when more fields come into production.

The Baltic Way

Transneft has started a rival project to evaluate the possibility of building a new pipeline to connect the Timan Pecora Basin to export terminals in the Baltic States or north of St.Petersburg. The project is called "the Baltic Way". The existing pipeline from Komi is in bad condition with frequent leakages, and the capacity is already congested. A decision to choose a pipeline solution from Nenets through Komi to export markets, requires a completely new pipeline.

Though the sea solution and pipeline solution seem competitive in this context, a combination of the two may well prove necessary in the long run. When all the fields are in operation, a combination of transport will be appropriate.

Plans for a new railway to connect Komi to Arkhangelsk port

A substantial part of the oil and oil-products from Komi is transported by the Northern railway to southern ports or to Arkhangelsk port for export. The transport from Usinsk and Ukhta to Arkhangelsk takes approximately 2.5 days. A part of the oil and oil-products transported from Komi to Arkhangelsk port is also transhipped to the settlements at the coast east of Arkhangelsk city by the Northern Shipping Company. A much shorter route from the fields and refineries in Komi to Arkhangelsk port, is planned by connecting the railway from Vendiga (a leg from Mikun) to Karpogory in the eastern part of Arkhangelsk county (se railway map). Such a railway will reduce the time used for transportation to Arkhangelsk port. The Russian planning of this railway has stopped because of lack of money, but the possibility of getting the project funded from the EC as a Finnish "Oulu-Arkhangelsk-Komi corridor - project", can give new vitality to the completion of the railway.

Gas pipeline between Arkhangelsk and Murmansk

A new gas-pipeline will connect Arkhangelsk city to the main pipe from Yamal through the Republic of Komi. The work is almost half-done, and will according to plans end in 1997. In connection with this project Gasprom is working on a feasibility study to connect this pipeline to a new line to Murmansk city. The pipeline will be built from Obozersk railway station south of Arkhangelsk city, and follow the railway around the White Sea and north to Murmansk city. Six parallel pipelines of 109 cm will lead the Yamal gas to Murmansk city and the rest of the county.

When the Shtockmanovskoye-field in the Barents Sea is ready for development, and the construction of the pipeline from the field to the shore is finished, gas will stream in the opposite direction from the Barents Sea to central Russia and export markets in Europe (se pipeline map).

Oil an gas products
A methanol factory will be constructed outside Arkhangelsk city to transform the gas from Yamal to methanol for export purposes. A joint venture, Metaprom (owned 34 % by Ferrostahl, 1 % by Port Authorities, and 65 % by Gasprom) will make foreign investments to the project likely. However, it is not yet known how much Ferrosthal will put into the project.

According to plan, the factory will be completed in 1997. The annual capacity will be 680.000 tons. The construction has not yet started, and several protests have been voiced from ecological and medical press-groups. A pipeline-gate will be constructed up from the main pipeline (from Yamal to Europe) in the southern part of Arkhangelsk County to the factory. This construction is about half-made, and is expected to be finished by the time the factory constructions are completed.

The methanol will be transported from the factory via a newly built harbour north of Arkhangelsk city. Because of ground water, the initial plans for supertankers for transport will be reduced. The harbour will serve 6000 ton-vessels. The methanol will be transferred to larger vessels in an ice-free harbour on the way to export markets. Most likely harbour is Murmansk or Liinahamari.

Arkhangelsk port is also important for transport of oil products to the settlements along the eastern coast. Northern Shipping Company operates this transport in the summer period from end of May until November. The products are mainly transported by rail to Arkhangelsk from Ukhta and Yaroslavl refineries.

5.2. FROM THE REPUBLIC OF KOMI

The Republic of Komi has no direct access to the sea. The territory is surrounded by Arkhangelsk County, Nenets Autonomous Area, Khanty Mansisk Autonomous Area, Perm County, Komi-Pemijatsky Autonomous Area and Kirov County. The geography makes northbound transport of oil and gas (produced in Komi) improbable[3]. No such transport across the territory of Nenets has taken place, and some reasons can be mentioned:

- Highly developed southbound pipeline system
- Transport on the rivers is difficult most of the year
- No infrastructure to the north
- Pipeline solution favoured by the authorities and Transneft

Oil and gas products have to a limited extent been transported on the rivers from Usinsk to the settlements along the Pecora river to Naryan-Nar. No such transport have been made

[3] Reviewer wants to know if transport of oil and gas by the railway to Lapitnangi is irrelevant. The author has never heard this suggestion for the fields in Komi since pipeline infrastructure is already well developed.

rearer to the coast along the NSR. Oil and gas products from the refineries in Komi Republic are transported by pipeline or railway to the south. Transport of products to Arkhangelsk and Murmansk are made by rail first south-west, and then north.

5.3. FROM MURMANSK COUNTY

Except from testing of fields, no crude oil or gas is produced in the county or on the continental shelf contiguous. Thus, transport is planned for fields that will be developed in the future. When ready for development, gas from the giant Shtokmanovskoye will be transported to the mainland by underwater pipeline.

Various transport solutions are presented. An underwater pipeline from the site can reach three junctions:

- Rybatchy peninsula (580 km)
- Teriberka (547 km)
- Kanin peninsula (510 km)

The specialists favour Teriberka as the site for a terminal. New pipelines must be built from Teriberka to Murmansk and from Petrozavodsk to Volkhov. An additional pipe for export is planned to Vyborg. Altogether 1338 km land based pipelines. Three parallel pipes of 1020mm will be constructed *(source: Sovjetsky Komsomolets).*

General director in Rosshelf, Boris Nikitin announced in June 1995, that two underwater pipelines will be built to terminals in Teriberka and Petsjenga south of Rybatchy peninsula *(source: Vetsjerny Murman).*

Oil and gas products

In connection with terminals at the Kola coast, Rosshelf is planning to build an LNG plant, a methanol plant and other facilities. At first, Teriberka was chosen as the site location, but Liinahamari soon became the best solution because of the ongoing projecting of the port. The advantages of Liinahamari are ice-free conditions in a deep fjord capable of serving large vessels. A complete development of the harbour project will not be possible without large foreign investments and receiving of crude oil and gas from the Pecora basin. The costs of developing Teriberka would be more reasonable and acceptable for the Russian side. The amount of production from the mentioned LNG plant is not known. Export markets for Russian LNG will probably be Western Europe and USA. An extensive export of LNG in specially built tankers will make use of the western part of NSR.

6. TRANSPORT OF EQUIPMENT TO THE FIELDS

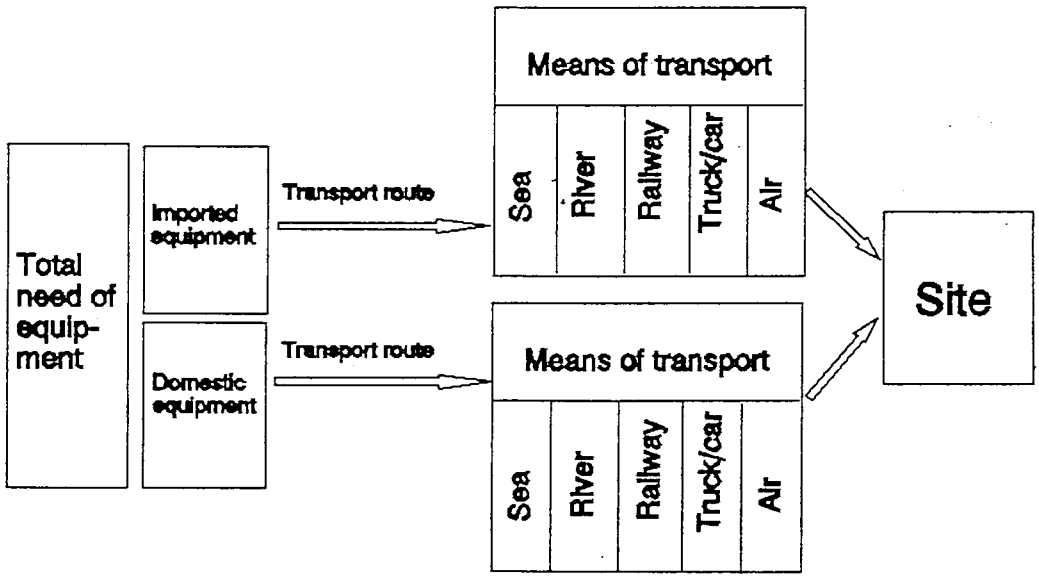
In a build-up phase with testing and development of new fields, transport of equipment to the site is quite extensive. With a large number of fields to be developed and a limited start of production, transport of equipment can be one of the most important transportation requirements during the first years.

The term equipment is here used as a general expression of all kind of materials needed for the development of fields; rigs, modules/construction, electrical, drilling equipment, product handling equipment, compressors, computer and communication, pipelines, junction and catering.

6.1. GENERAL MODEL

This chapter will discuss a general model for transport of equipment to the fields in the region.

Figure 3 Transport of equipment



Of the total need of equipment, imported and domestic produced equipment will vary in quantity. The amount of imported equipment will vary with:

- company form
- agreement between companies and authorities
- Russian competence and standards

A. Company form

A purely Russian company (and specially a state integrated company) operating in Russia, will be under an obligation to buy as much as possible of the equipment from domestic producers. The reason for Russian companies to form joint ventures with foreign companies is usually the need of foreign investment and equipment for development of the fields. A JV is therefore often more disposed to choose imported equipment than is a purely Russian company operating alone.

B. Agreement between companies and authorities

A production sharing agreement (PSA) between the Russian authorities, Russian companies and foreign partner companies will usually include a clause about the Russian share of deliveries; equipment, service and workforce included. The latest signed and discussed agreements for fields in Northern Russia have a relatively large percentage of Russian deliveries. This is a consequence of a high priority to utilize the regional converted defence industry for delivery of equipment to the oil and gas industry.

C. Russian competence and standards

Russian equipment standards are variable. They are good at producing pipelines, steel-rigs etc., but need to import some technical and electronic equipment. Offshore technology is not so well developed, while they have experience of onshore activity, specially in arctic climate. Where the Russians cannot produce the equipment themselves, they will usually make agreements on imported deliveries from western firms.

Transport routes for the equipment are dependent on where the producer is situated and where the production site is located.

Concerning imported equipment, producers from Western Europe and USA will probably be used. Sea transport is most likely to coastal fields and offshore. Rail transport can also be appropriate from European producer to the train junction with harbour nearest the field. For our region, this will be Murmansk and Arkhangelsk. A reloading to ship can take the equipment to the site, or; (if the field is onshore) to the nearest harbour for onward transport by river boat or truck. Air transport of equipment by plane or helicopter is quite expensive, and will usually only be used for the last stage of the journey to the site where no other transport is available.

For home produced equipment, railway transport will be more common. With a field located near a railway track, other means of transport of equipment from central Russia is seldom profitable. But more and more of the Russian equipment will be produced in the North of

Russia. The Severodvinsk and Murmansk areas will certainly develop as producers of oil and gas equipment. The fields in Nenets have no railway connection, and sea transport will be necessary to supply these fields with equipment produced in north and central Russia. The latest will probably be sent by rail to Arkhangelsk or Murmansk port for further shipment to the fields. River and air transport will be options for Russian produced equipment to reach the site.

Means of transport are dependent on:
- Existing infrastructure
- Existing regular cargo routes
- Cost of transport, fees, icebreaker assistance
- Regularity, climatic conditions
- Type of equipment
- Agreements with Russian transport companies

The following chapter will describe the transport of equipment to some of the most important fields in the region, both in production and under planning.

6.2. REPUBLIC OF KOMI

We will not go into the transport of equipment to all fields in the Republic, but rather concentrate on information about the northern fields near the Nenets border where transport can be made from the Northern Sea Route. The only possible connection from the sea to the northern fields is along the Pecora river. The port of Naryan-Mar at the outlet of the Pecora river, can only serve the medium range ships from the Northern Sea Route. All river transport must be done by specially built river boats, and this means reloading of the equipment. This enormous river has a limited period of navigation, and because of shallow water, only lighters of 1.4 meters draft can pass. (See more information in report by Sverre Høifødt).

According to Komineft, the transport of equipment to Usinsk on the Pecora and Usa rivers is very limited. It is a consequence of difficult navigation on the rivers with low water level and use of small vessels. Only for 3 weeks during the spring flood in late May is it possible to sail up to Usinsk. It is not known what kind of equipment this transport constitutes, but most equipment is probably for geological expeditions operating near the river bank.

As far as we know, all fields in production have their equipment transported by railway from producers in the Republic, from other Russian regions or from abroad. The Komi railway crosses the Republic in a north-easterly direction and serves all the important production sites with branch lines. In case of lacking infrastructure, trailers and lorries are used for the final stage to the site.

6.3. ARKHANGELSK COUNTY / NENETS AUTONOMOUS AREA

Polar Lights

As Polar Lights is the only JV field in production in Nenets AA, information about transport of equipment to the development of this field will be analysed. The field is situated in the central part of Nenets east of Naryan-Mar without stable road connections. Making the transport of equipment difficult. Sea transport started in 1992/93 by the Arkhangelsk based "Northern Shipping Company", which has the monopoly on sea transport in the area. Equipment from producers in USA or Europe has mainly been shipped to the port of Arkhangelsk, and transported by railway to Usinsk in the Republic of Komi. The railway distance is quite far, because of the lack of direct connection. The track first goes to the southern part of Arkhangelsk county and then east to be connected to the Komi railway. In the north-eastern direction, is follows the Vorkuta route before turning north on a branch line to Usinsk.

Because of a long distance and a poorly maintained railway-system, such transport takes a minimum of 3 days. The equipment is stored in Usinsk where "Polar Lights" operates a base, before being transported across the tundra during the winter. The area is covered by swamp, rendering trucktransport impossible most of the year. The damage such transport causes to the vegetation and natural environment makes winter transport indispensable.

The Russian produced equipment has also been transported to Usinsk by railway from the other regions of Russia to the fields. 150 Russian sub-contractors delivered equipment and services to the project. Most important was the deliveray of pipes to connect the field to the pipeline system from Kharyaga. The distance from the Ardalin field to Kharyaga is 65 km. Kharyaga has a road-connection from Usinsk (constructed by the Russians), and pipes were transported to Usinsk by railway from the Russian producer, and then by truck to the construction site.

High speed shakers were also delivered from Russian producers. Old rigs were rehabilitated by Russians and Americans in Naryan-Mar, enabling the use of western modules and technology. Steel modules were produced in Houston, USA and transported by ship, railway and truck to the field. Most technical and telecommunications equipment and module living quarters were also delivered from the west.

According to the Arkhangelsk County statistics *(referred to in Barentsnytt, June 1995)* Polar Lights imported equipment for 41,3 million dollars in 1994. Most of it came from USA and Finland.

Prirazlomnoye

Prirazlomnoye is the first field among the JVs under planning to be developed. Though exact information is hard to obtain in a planning phase, the main priorities have already been made[4].

The offshore Prirazlomnoye field has probably been developed to start production in 1999, and sea freight will constitute a maximum of the total transport of equipment to this field due to lack of other infrastructure.

The first transport of equipment to the field is planned to start in spring 1996. According to Brown and Root there have already been contacts with the Northern Shipping Company (NSC). The company, with an administration in Arkhangelsk city, serves the need for transport along the northern coast and long distance freights. NSC has for instance regular cargo routes to Rotterdam and Hamburg. Almost all sea transport to the field will be made by NSC, but Murmansk Shipping Company in Murmansk can also be on contract. Murmansk and Arkhangelsk ports will be used as loading, shipment, and transport facilities.

Equipment from several western companies will be collected in suitable ports in Europe and Scandinavia to be transported by the Russian companies. Small cargoes can be sent to Finland, and transported by railway to Severodvinsk and Arkhangelsk.

An agreement of percentage share of delivery of equipment and service between the Russian and foreign partners, is expected to be signed in the end of 1995. Like in most other JVs, the demand from the Russians will probably constitute 70 % in the "building up" phase.

The policy of the Joint Venture is to use regional competence to build up the oil and gas industry. Therefor, Sevmasjpredprijatie in Severodvinsk will be responsible for the building of modules. Two ice-resistant jack-ups will be delivered in 1997 and 1998. They are the first made for arctic waters, and will have a weight of 1400 tons *(source: Barentsnytt May, 1995)*. A training-program has started for the employees at Sevmasj to apply their military submarine knowledge to the building of platforms. BHP-Hamilton has formed a JV with "Rubin" shipyard in St. Petersburg. Rubin will design the platforms for Prirazlomnoye.

TPC-fields

The TPC-fields will be developed by multi well pads to protect the tundra. The drilling rigs will be special constructed for Arctic climate, and pipelines will be built above ground. The schedule for a development of TPC-fields has not yet reached the stage of detailed planning for transport of equipment, though, some hypotheses can be drawn the given information and geographical position of the fields.

The TPC-consortium first declared it would employ 50 per cent of the total capital in Russia.

[4] Information is given by the Brown & Root representative in Arkhangelsk.

Meaning that much of the supplies of equipment, materials, construction, service and labour will be delivered from within Russia. The Russian side could not accept this distribution, and the outcome of the dispute will probably agree 70 per cent for the Russian deliveries, as in most oil and gas joint ventures of today. This leaves only 30 per cent of the value in the project to foreign companies. Except for the percentage share between foreign and domestic deliveries, the kind of equipment that will actually be delivered from abroad, has not yet been identified.

However, even Russian produced equipment, must be sent by ship to the coast of Nenets since no other infrastructure exists. Producers from central and northern Russia will probably send their materials by railway to Murmansk or Arkhangelsk ports, and ship them to Varandey, the port of delivery to all TPC-fields.

Imported equipment will primarily arrive by sea directly from Houston, Texas or from Europe.
This indicates that transport of both domestic produced and imported equipment will make use of the NSR.

6.4. MURMANSK COUNTY

The planning of the development of the Shtockmanovskoye field has not yet produced a detailed program for import of equipment. Production will commence in 2003 at the earliest, and it is not known to what extent foreign companies will be involved. Rosshelf has indicated that 70-80 % of the materials/services will be delivered by Russian companies, and that the former defence industry in the north will be contracted *(source: Vetsjerny Murman).*

We do know something about the kind of equipment generally needed for such a development, and what must be imported, but we know little about where they intend to buy such equipment. Platforms are not yet ordered, but will probably be built in Severodvinsk. Nerpa shipyard outside Murmansk will be reconstructed to deliver pipes of concrete to the under water pipeline.

Foreign companies will likely contribute with technical and communication equipment.
Imported equipment will arrive by sea, or can be sent by railway to Murmansk through Eastern-Europe or Finland. Since Shtockmanovskoye is situated in the western part of NSR, transport of equipment to the field will only give limited effect on the use of the whole route. Some sea transport will be made from Arkhangelsk and Severodvinsk. The rest will be from the west.

7. SUPPLY DURING PRODUCTION

Polar Lights
The main supply base for the Ardalin field is situated i Usinsk. Equipment and spare parts for the production are usually transported to the supply base for further transport to the site. In case of emergency, the needed items will be flown in by helicopter.

Needs for energy and fuel needs during the production phase will be delivered by the Russians. Catering services are mainly delivered from the west, flown in to the site. NSR will not be
used for transport purposes.

Prirazlomnoye
All supply of equipment during production will be sent to the supply base in Arkhangelsk or Murmansk to be transported by ship to the field. Helicopters or planes will only be used for emergencies and for of transporting important, forgotten materials to Varandey airport. Catering services will be purchased from suppliers in the Narjan-Mar area to develop the local food industry. The use of NSR will be considerable for supply to this field.

TPC-fields
Murmansk and Arkhangelsk will be suitable ports for supply of products and equipment before shipping them to the shore. The size of ships transporting the products, will be limited by difficult ground conditions. Varandey will be the main site of storage before land transport across the tundra. The village has little facilities, and relatively few permanent residents. All services connected to running of the fields must therefore be taken care of by visiting workers. The existing airport will be improved to serve larger planes and establish sufficient facilities. The use of NSR will be quite extensive for supply during production.

8. RELATED TRANSPORT

Polar Lights
Moving of personnel is an important part of the related transport. Personnel working on the site have a recreation base in Usinsk in Komi. It means that the leisure time is spent here, and most Russians have their home in the city. They are transported to the field by bus to Kharyaga, and by helicopter on to the site. Normal working model is two weeks on and two weeks off, but this can vary. Most foreign personnel (Americans) are regularly transported to their homeland, or to Arkhangelsk during their free time. Some administrative personnel are also placed i Naryan-Mar, and the main office is situated in Arkhangelsk city in the Arkhangelskgeologia building.

As long as the crude is sent by pipeline southwards, little related transport will be made by sea. In a longer perspective, a northbound connection to "Northern gate" may be relevant.

Such development could mean increased use of NSR for transport connected to refinery of the crude oil.

Prirazlomnoye
Naryan-Mar will be the base for personnel exchanges. Personnel can be flown in by plane to Varandey, or directly to the platform by helicopter. The main office of representation will be in Arkhangelsk, where the foreign partners have their offices.

The crude from Prirazlomnoye will mainly end up in Europe by direct tanker vessel transport. Transhipment in open sea is also possible. In addition, several projects are under consideration concerning refinery in Russia before exporting the final product. Such refinery facilities will be constructed along the coast of NSR in Arkhangelsk and Murmansk Counties. Construction of refinery plant and supply during production, will generate more transport along the NSR, though the extent of transport is dependent on the total amount of crude sent by NSR and the use of any pipelines running southwards.

TPC-fields
Crude oil transported from the floating terminal by sea is equally likely to generate related transport as the crude from Prirazlomnoye. A pipeline solution southwards would diminish such transport.

9. CONCLUSION

This paper has given an analysis of the oil and gas industry in the north-western part of Russia as it is today and the kind of plans that exist for further development of fields and related industry. The present production is sent southwards by pipeline to central and southern Russia. This transport will have no effect on the use of the NSR. Other fields, planning to be developed, intentend to transport crude and oil and gas products by sea along the NSR to markets in Europe and USA. This will also affect the use of the route for transport of equipment, supply during production and related transport.

The geographical area (Murmansk and Arkhangelsk Counties, Republic of Komi and Nenets Autonomous Area) is not at present the most important for oil and gas industry in Russia. Transport from the giant gas fields in Yamal further east will have a bigger effect on the use of NSR in the first years. In north-western Russia more fields will gradually be developed, and will be followed by related industry for refinery of products, and improved transportation infrastructure. The peak of transport by sea along the NSR to serve this industry, will probably be reached in ten years from now.

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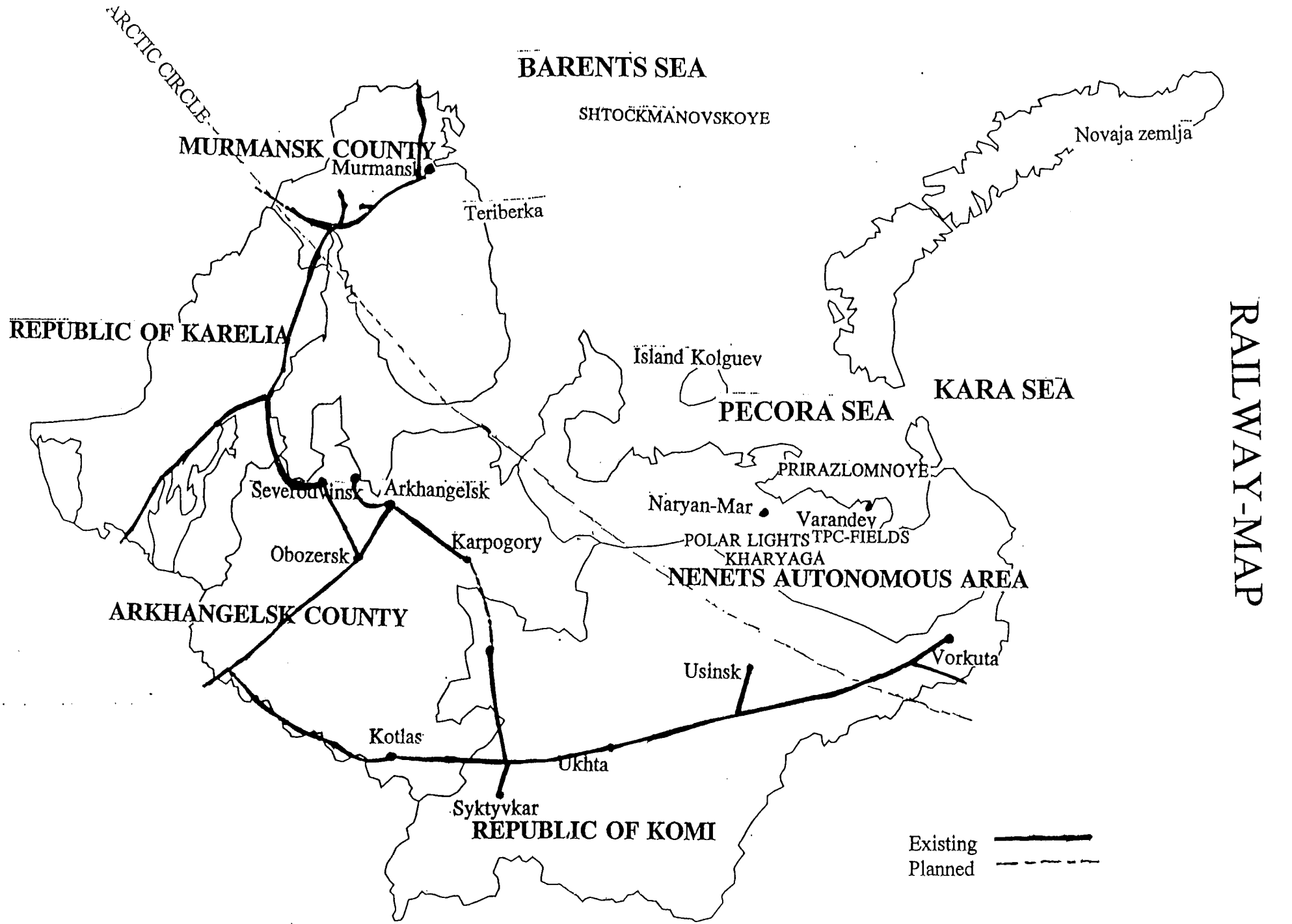
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BARENTS SEA
SHTOCKMANOVSKOYE
Novaja zemlja
MURMANSK COUNTY
Murmansk
Teriberka
REPUBLIC OF KARELIA
Island Kolguev
KARA SEA
PECORA SEA
PRIRAZLOMNOYE
Severodvinsk
Arkhangelsk
Naryan-Mar
Varandey
Karpogory
POLAR LIGHTS
TPC-FIELDS
KHARYAGA
Obozersk
NENETS AUTONOMOUS AREA
ARKHANGELSK COUNTY
Vorkuta
Usinsk
Kotlas
Ukhta
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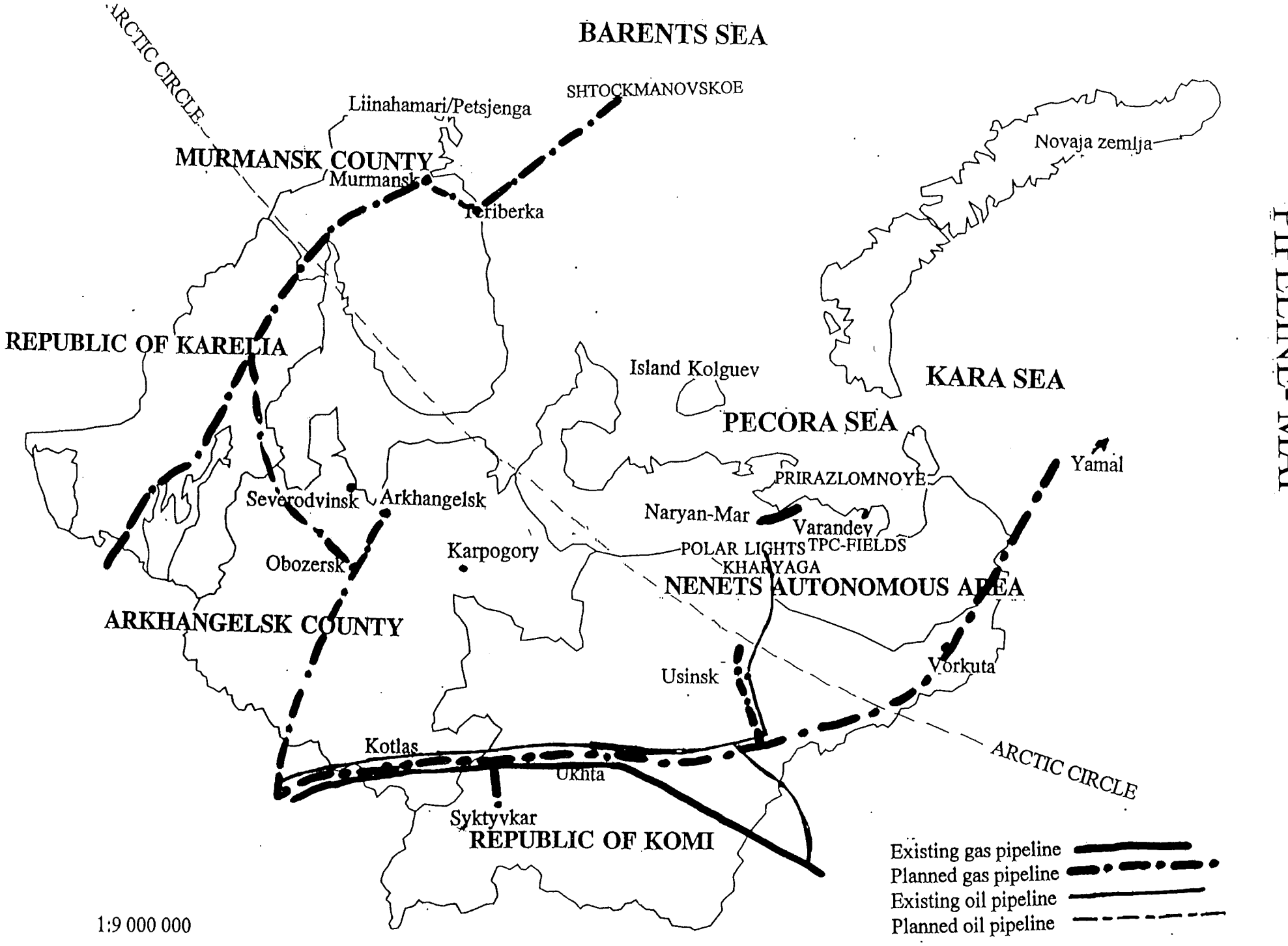


PIPELINE- MAP

APPENDIX

REVIEW BY JØRGEN OLE BÆRENHOLDT

Jørgen Ole Bærenholdt Roskilde, 5 February 1996

Review of
"Oil and gas in the north-western part of Russia", by Vigdis Nygaard, FINNUT - a part of the INSROP III.02.3 project "Selected Isssues in Regional Economic Development along the NSR".

General comments:

This paper is providing a **lot of information**, which is easy to approach for the reader, thanks to a very **clear structure.** Chapter 3 "Current fields and companies" is a relatively comprehensive guide to the complex oil- and gas-industries in the Republic of Komi and Nenets Autonomous Area - as well offshore in the Barents, Kara and Pecora seas, including information on ownership, joint-ventures etc.. Information collected in a trip to the regions in question in May 1995 are combined with references to both Russian and non-Russian sources, as the author is mastering Russian herself. This is undoubtly a report by an expert!

Chapters 5-8 on transport questions possibly involving NSR are detailed and well structured as the rest of the paper, but the reader **miss some estimations of quantitative amounts** of oil/-gas, equipment, supply and related transport, as there are no comparative considerations on the scales and amounts of material (and numbers of personnel) of different kinds which could be transported by sea.

Better maps!

As the geographical image of the transport solutions is quite important, to use maps is an appropriate way og communication. The paper currently includes two maps
- general map of the region: lacks title, scale, names of seas refered to, and i.e. the Artic circle (in stead of "North" due to the reasonable projected selected)
- Railway-map: this or another map could include more comprehensive information on all oilfields and gas deposits mentioned in the text, and pipe-lines would be nice to added as well. (I admit to be a geographer!)

Some detailed comments:

p.13 the concept of "regionalism" has many - interconnected - meanings (i.e. Barents Region as cross-border regionalism). It should be mentioned here that the kind regionalism in question is efforts towards higher degrees of regional self-government **inside** the Russian Federation.

p.13 The indiginous people depending on tundra for pasture is important to mention, but on the other hand I have heard of examples of indiginous people on Yamal Peninsula eager to participate in gas industries as a way of raising their standards of living (information from Russian geographer Yelena Andreeva). Do you have any kind of

information about such dilemmas?

p.14 "PSA legislation..." is ?

p.14 comments on the parlamentary election in December 1995 - worsening the conditions for "both foreign and Russian" oil and gas companies. This is a rather one-sided Cold War type statement, without any argument!

p.15 oil refinery could also be mentioned here

p.16 "The costs of running the fascilities will probably be cheaper than a pipeline solution" - this is very fast comment for a very crucial question (not at least for sea transport prospects), which is not discussed in more detail nor related to other projects/publications on this question.

p.17 "... the settlement at the coast east of Arkhangelsk city..." propably has a name - and could be on a map.

p.17 a question beyond the limits of the paper: Gas supply from Yamal to Murmansk - will it be enough for supply of a gas power plant taking over after Polyarni Zori nuclear power station (this could be a counter argument to the argument in favour of a new nuclear power plant on the Kola Peninsula, presented for Norwegians readers by the editor of "BarentsPerspektiv" (December 1995)).

p.18 "The geography makes northbound transport of oil and gas ... little likely" - (and p.22 considerations on Pecora river) does this mean that you find Trond Rangnvald Ramslands (and H.C.Dall Nyrgård? in INSROP Discussion paper, projekt III.01.3) considerations on the possibilities of using the railway to La Pitnagi in the Ob delta irrelevant?

p.19 More information on the advantages and disadvantages of Teriberka versus Liinahamari in Petsjenga as site of terminal - from different points of view and interests - would be interesting!

Jørgen Ole Bærenholdt Roskilde, 12 February 1996

Review of INSROP discussion paper III.02.3 Selected issues on Regional Economic Development along the NSR - title: Exports of fish products from Norway to countries in the Far East, by Margrethe Aanesen and Geir B. Hønneland.

General comments

This paper offers a well structured presentation of Norwegian fish exports to the Far East - mainly Japan - and potential possibilities of using the NSR for this export. The paper ends up with some very clear conclusions on the specific conditions needed to make the NSR competitive.

The general title of the subprogramme "...Regional Economic Development along the NSR" seams misleading when compared with the actual content of the report, as there is no discussion on development" along the NSR (from Murmansk and to the east) at all. (This is off course only a formal comment for the management of the subprogramme)

The limitation of the paper, also stated in the introduction, is first of all that it only deals with Norwegian exports (for Japan it is only around 6-7 % of total imports (tons)). The introduction "Background and limitations" argues, that there are no prospects for development of processed products in North-Western Russia (documentation is only reference to one report missing full reference (i.e.title) and having one author in common with this paper!). Personally I do not agree on this topic, I find no outspoken arguments in this paper, and I am suspicious whether or not the background could be Norwegian wishes to continue raw fish imports. (I.e. to construct the reality in accordance with such wish thinking!) Why are there no Russian reference on this topic (or joint Russian-Norwegian reports such as A.Vasiljev/ T.Davidsen)? And only one non-Norwegian reference! (Buchanan).

The paper apparently lacks considerations on different time perspectives in the development of Russians efforts in relation to quality of fish processing and transport. Long-term (more than 10 years) prospects could be supposed to be most relevant for NSR-development.

Nor do I find any consideration of former possible use of the NSR by the North-West Russian fishing industry in 1970s and 1980s, when vessels of i.e. Murmansk were actually fishing in the Beering Strait and the Pacific Ocean.

Finally, from the perspective of possible fish transport through the NSR (maybe rather than "development along the NSR"), the paper never mentions the potentials of fish (including shrimps) export through the NSR by other Western nations than Norway, i.e. Germany, Denmark, Greenland or Iceland.

Formal comments

Apart from chap. 1 - there are no references in the text. This is especially a problem, since it is therefore not clear to the reader which information are second-hand built upon other papers and which are gathered from the interviews done with 13 Norwegian exporters.

The interviews are introduced rather late in the report, and there is no evaluation of the interviews (i.e. validity and reliability of the information). It seems to be a problem that the potential bias in the sample admitted (p. 11), is that the interviewers/researchers apparently excluded (mainly North-Norwegian) exporters without export to the Far East in the year 1994 from the sample. Such exporters might give valuable (and critical) information on the export situation.

Finally, the paper cannot agree with itself, whether or not Japan is a part of the Far East. (In think it is! - and therefore "Japan and the Far East" is nonsense).

Detailed comments

p.1 First sentence is not clear (demand where, supply where, Japan versus Far East)

p.1 "We have not thoroughly analysed the question whether fish products are relevant goods for transportation along the NSR" - good to state limitations, but this one is quite big!

p.1 "... on-shore fish processing industry in Murmansk is in a poor condition and barely capable of producing fish products which meet the quality demands for the Western market." (see also general comments) Is this also true for "Nordwest"? Or for i.e. Kolkhoz Murman in Teriberka (described in my own field report "Innovations and adaptability of the Murmansk Region Fishery kolkhozes")

p.1 "...important shipowners have obliged themselves to such an arrangement in order to finance the building of new fishing vessels in Norway" - how many? how much have the obliged themselves to deliver?

p.3 first sentence correct language: "large population" in stead of "large number of persons

p.3 table 2.1 lacks source

p.4 "Frozen marcherel is the sing.....71% of total export **value** - NO, the unit in table 2.2 above is **tons**!

p.4 numbers in text is not clear to the reader - as some numbers in table are for Salmon and trout in general - but others in the text is only about frozen - and the important big quantity of fresh is not mentioned until p.11

p.6 last sentence: only if Norway is competitive!

p.7 "xx%"?

p.7 "13 Norwegian exporters..." - considerations on the interview method is needed in advance to the information here

p.10 again: "...data are (? - were!) collected..." by who, when etc.

p.11 (see also general comments) why did these exporters not export in 1994???

p.11 here or earlier: add evaluation of interviews (see also general comments)

p.10-11 I would prefer a more structured presentation of data in text (or more tables)

p.11 table 4.2: sentence under table should be included in subtext of table, as the table is not understandable without this information. (Last line inside table is confusing, should be presented in another style than the two first lines)

p.11 33-35/kg - must be **product price** (before transport)

p.12 how much is consumer price???

p.12 what is the reason for the seasonality in transports (seasonality of production of breeded salmon/trout - or of consumer demand???) - important to state for considerations on p. 13 in relation to NSR

p.13 "...markets... attractive...." - according to the exporters successful with export to Japan in 1994! -(Is it actually true for other Far Eastern markets than Japan?)

p.14 table 4.3 - last line should be another style (similar to table 4.2)

P.14 exporters discharge/unload in Japan - but in the case of mackerel transport should be the responsibility of importers???

p.15 good and interesting considerations on the advantages of long transport time at certain times of the year!!!

p.18 Language - "Summary" in stead of "Summarize"

clear conclusions!

p.19 "If it is only Russian suppliers of transportation which operate the Route, the prospects for an extensive use with regard to fish products to the Far East will probably be bad". I see the point in relation to punctuality and stability, but is this true in all future???

Jørgen Ole Bærenholdt, Roskilde, 3 April, 1996

Review of INSROP Discussion paper within III.02.3 (although stated as III.02.2 on the copy mailed to me directly from the author 28 March 1996)**: Selected issues of Regional Economic Development along the NSR: Sverre Høifødt (Acta Consult): River transportation of timber and timber based products in North West Russia (20 pages)**

General comments:

The paper gives an overall overview of current river transport of timber and timber products through the river systems of Onega, Dvina, Mesen and Petchora. Information was gathered on a field trip in May 1995. The paper is well written and reaches interesting overall - negative - conclusions on the current amount of river transportation, as railway transportation is more important. NSR is not competitive at the moment. This is due to the Southern location of both domestic and to foreign markets demanding the qualities of timber products produced today - and to the disintegration of timber-industrial and river transport complexes following the increasing importance of industrial control by regional (Arkhangelsk Oblast incl. Nenets Autonomous Okrug and Komi Republic) authorities.

The main quality of the paper is that it reaches overall conclusions which are only possible due to first-hand information and impression from field work. On the other hand, the paper is rather general, gives only detailed information in selected cases (localities visited of course) and is not going further into questions of either internal technological potentials of the timber-industrial complex in NW Russia - or external market trends in the future. But the paper implicitly suggests further research into these questions - as well as to the potentials of river transport on the major Siberian river systems of Ob, Yenesei, Lena and Kolyma (also shown in map 1, p.5). An III.01.3 project has already studied Ob-Irtysh and Yenesei in respect to petroleum exports.

The paper clearly puts new light on the latest development of timber industries, which was also analysed by the same author in INSROP working paper 16 (project III.02.1 The NSR and possible regional consequences, chap. 9, written in 1994). But the new paper does not add any references of either scientific literature or magazine in forestry. A further development of the idea of building transnational regional clusters of production is not intended, but also for such a purpose, cooperation with Finnish Research Milieus (e.g. Karelian Institute in Joensuu) could be interesting for the future and maybe add further comparative analysis of possibilities of NSR versus Baltic infrastructure.

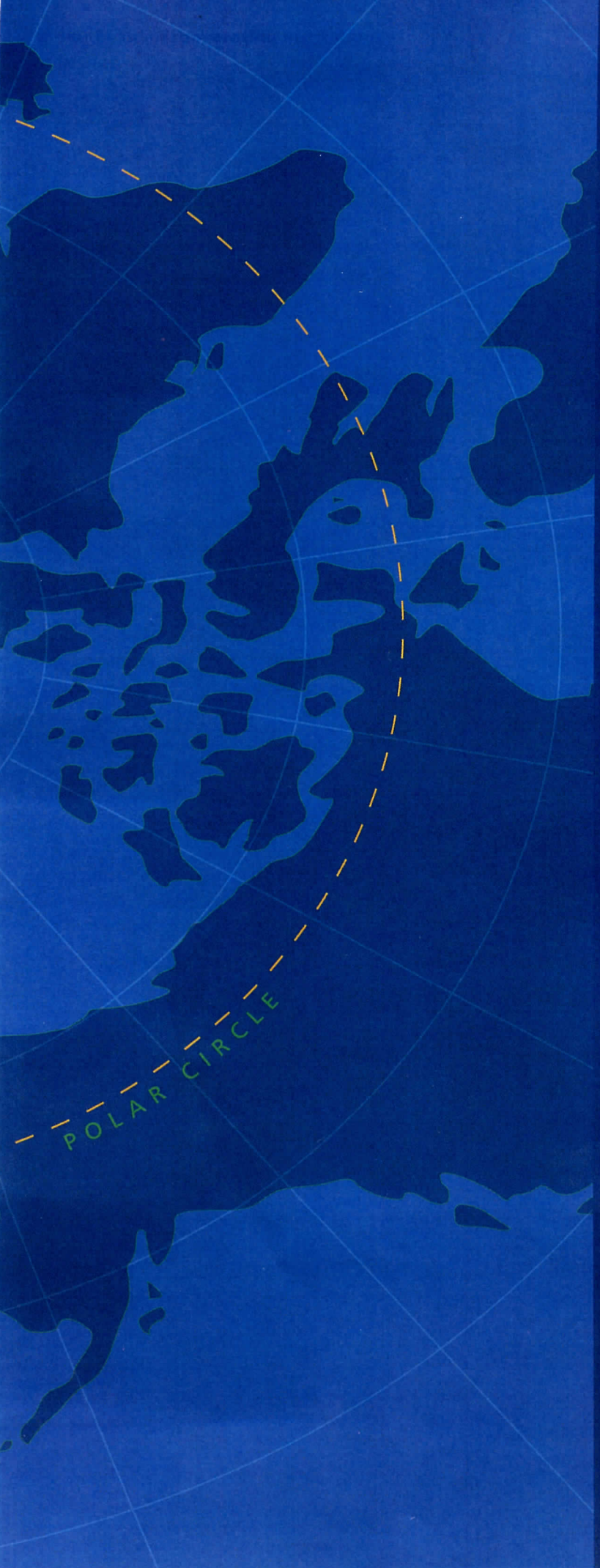
A few detailed comments

The maps produced lack scale (i.e. km-scale) and orientation (i.e. Arctic Circle).

p.11 very interesting that White Sea channel transport is not more expensive than NSR from Arkhangelsk to Oslo! Are there indications of public support (subsidies) in Russia in favour of railway and other domestic transport corridors?

p.12 Correct "eastern" to "western" (on the location of river Onega in Arkhangelsk)

Jørgen Ole Bærenholdt



The three main cooperating institutions of INSROP

Ship & Ocean Foundation (SOF), Tokyo, Japan.

SOF was established in 1975 as a non-profit organization to advance modernization and rationalization of Japan's shipbuilding and related industries, and to give assistance to non-profit organizations associated with these industries. SOF is provided with operation funds by the Sasakawa Foundation, the world's largest foundation operated with revenue from motorboat racing. An integral part of SOF, the Tsukuba Institute, carries out experimental research into ocean environment protection and ocean development.

Central Marine Research & Design Institute (CNIIMF), St. Petersburg, Russia.

CNIIMF was founded in 1929. The institute's research focus is applied and technological with four main goals: the improvment of merchant fleet efficiency; shipping safety; technical development of the merchant fleet; and design support for future fleet development. CNIIMF was a Russian state institution up to 1993, when it was converted into a stock-holding company.

The Fridtjof Nansen Institute (FNI), Lysaker, Norway.

FNI was founded in 1958 and is based at Polhøgda, the home of Fridtjof Nansen, famous Norwegian polar explorer, scientist, humanist and statesman. The institute spesializes in applied social science research, with special focus on international resource and environmental management. In addition to INSROP, the research is organized in six integrated programmes. Typical of FNI research is a multi-disciplinary approach, entailing extensive cooperation with other research institutions both at home and abroad. The INSROP Secretariat is located at FNI.