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Building a High North Growth Pole: The Northern Norwegian City of Hammerfest in the Wake of Developing the “Snow White” Barents Sea Gas Field

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Abstract

Global oil industries are moving from well-established economic centres to remote areas in the north. This paper addresses regional impacts, and links the analyses and discussions to theories embedded in Keynes inspired ideas from the 1950'ies of state opportunities to build growth poles in peripheries by governing entering industries. The article analyses changes in the North-Norwegian city of Hammerfest for the period of 2002-2008 during which time the Snow White gas field was developed and includes local supplies positions, local employment changes; commuting patterns; demographic shifts; variation in youth attitude concerning future living; vicissitudes in local housing markets; local tax system changes; local welfare; and gender relations changes.

Keywords: global oil industry companies; regional impacts; growth pole strategies; Norway

1.0 Introduction

During the summer of 2002, the global oil industry entered the Norwegian portion of the Barents Sea (Barentshavet). During the early 1980s, the first gas field of the Barents Sea, “Snow White”, was discovered: It was not until 20 years later that the Norwegian oil company Statoil began to focus on its development. The process, which lasted from 2002-2008, included development of subsea production installations at the offshore field; construction and building of the biggest factory for processing and export of Liquefied Natural Gas (LNG) in Europe; and connecting subsea installations and the factory near the city of Hammerfest via a 143km pipeline.

This article addresses the local and regional impact of a global oil industry entering a Norwegian periphery. It will demonstrate and analyse the Hammerfest case within the framework of Norwegian development and associated policies, including territorial perspectives linked to theories concerning the oil sector's role in building new economic growth poles (Perroux, 1950; Parr, 1999a, 1999b) outside already established economic centres; roles of state oil policies in implementation of territorial growth pole strategies (Cumbers, 2000); and the northern parts of Norway as followers (as opposed to pioneer regions) in the development of the Norwegian petroleum sector.

The major focus of the article will be on the analysis of data from Hammerfest for the period of 2002-2008, during which time the Snow White field was developed. In 2002, Hammerfest had a population of 9000 and for many years was proclaimed the world's northernmost town. It was originally established in the 1950s as the centre of a new Norwegian industry focused on the production of frozen fish filets for the global market.

This analysis is based on data, presented as a trail research following the development of the gas field, which relate local supplies and suppliers; employment changes; commuting; demographic shifts; variation in youth attitude concerning future living; vicissitudes in local housing markets; local tax system changes; local welfare; and gender equality. The study was funded by the municipal council of Hammerfest, the county council of Finnmark and Statoil, and was headed by the author (Eikeland et al., 2010a, 2010b).

2.0 Pioneer and Follower Regions in the Norwegian Oil Economy

The Norwegian economy is based, to a high degree, on the generation of economic benefits from natural resource exploitation. Fisheries, iron ore, forestry, and hydroelectric power have all played central roles in economic growth and prosperity over the past 150 years (Bergh et al., 1983). The discovery of oil and gas resources in the North Sea in the 1960s reinforced the country's reliance on natural resources.

Within a few decades, the petroleum sector has come to dominate the Norwegian economy. In 2006, crude oil, natural gas, and pipeline-related services constituted 25% of the country's gross domestic product and contributed to 36% of the state's revenue. This revenue is (in part) used to pay into the Government Pension Fund of Norway, which invests in global stock markets to secure the value of the fund for future populations who will have no oil resources available. As of 2012, the value of the fund neared 70 billion USD. In 2010, more than 30% of all domestic real investment went to the petroleum sector (Statistics Norway, 2011).

Norwegian oil and gas production currently occurs at 72 fields on the Norwegian Continental Shelf where 38 operators and 68 licensees are active. Statoil owns most of the operatorships. Petoro manages the government's financial holdings in the petroleum sector and is also a major licensee. Among the largest international oil companies operating at the Norwegian Continental Shelf are Eni, Total, ExxonMobil, ConocoPhillips, Shell, and BP. Major industrial infrastructure has been established, including platforms; production storage and offloading vessels; pipelines; fibre-optic networks; receiving terminals; and processing facilities. More than 9000km of export pipelines and 3000km of intra-field pipelines have been contracted on the Norwegian Continental Shelf in previous decades.

The development of the onshore petroleum sector in Norway began in the Stavanger region along the southwest coast. This was initiated in the mid 1960s with foreign oil companies and new service companies opening offices and bases in the Stavanger area. Proximity to the exploration areas in the North Sea, along with Stavanger's reputation as a service and communication centre and active involvement from the municipal council, were decisive factors for the location (Egeland, 1984). In time, a network of subcontractors grew in the region. The establishment of the Norwegian Petroleum Directorate was a political affirmation of the city as Norway's oil capital. This development has transformed the economic activity and urban community life of the Stavanger region in a fundamental manner: since the 1970s, it has experienced the strongest population growth of all Norwegian regions.

Since the initiation of development in the southern part of the North Sea, petroleum activities have gradually expanded northward along the coast. The first licenses in areas north of latitude 62 °N were issued in 1980, initially for the Norwegian Sea then later in the Barents Sea. The start-up Snow White

operations in 2008 marked both the increasing importance of Norwegian gas production and the entrance of petroleum activities into the Barents Sea.

Based on analyses of national employment data from Statistics Norway, Thoen & Johannesen (2011) concluded that the petroleum sector was not of major importance for the total employment in Norway: accounting for just 3.5% of the total employment in the private sector in 2010. However, employment in the petroleum sector is experiencing strong growth, having increased by 14,000 employees or 30% since 2003, and is dominated by male employees 30-50 years of age with education levels that are above the average for the population as a whole (Thoen & Johannesen, 2011). Moreover, the petroleum industry has employees in no less than 421 of the country's 430 municipalities, owing primarily to the fact that employees on the continental shelf have long leave periods, which is well suited to long distance commuting. However, employment is concentrated in two counties in southwestern Norway, Rogaland and Hordaland, where 60% of the employees resided in 2010. Rogaland (including the Stavanger region) also has the largest annual increases in employment. By contrast, the three northern Norwegian counties accounted for 4% of the employment in this sector in 2010, an increase from 3.3% in 2003. However, during the same period Finnmark County, which is Norway's northernmost county and host-county of the Snow White factory in Hammerfest, has increased its proportion of the total employment from 0.2 to 1 % (from 103 to 593 employees).

This article focuses on occurrences within a small city in the northern part of Norway in the wake of petroleum activity incursion. Exploration on the Norwegian Continental Shelf in the North Sea started up in the 1960s, and was followed by pursuits in the Norwegian Sea in the 1980s with production beginning at the Norne oil field in 1997 (prior to development of the Snow White field in the Barents Sea in 2002).

The Norwegian petroleum activity has since spread northwards; however, the driving forces have varied and consist primarily of two types. First, there are those forces linked to communities and regions having clusters of industries or knowledge environments that attract activity, and to a certain degree regardless of the extent of the field activity on the continental shelf close to the coastal communities. The construction and development of supply vessels was an important activity in the Møre and Romsdal region for more than a decade before the initiation of oil and gas field development outside this region. Furthermore, the Trondheim region developed a core focus in Norwegian R & D oil and gas exploration, development, and operation even though this activity was primarily south in the North Sea. In the Harstad region in the south of Troms County in northern Norway, Statoil established an exploration and operations centre that in turn became a separate driving force for identifying petroleum deposits north in the Norwegian and Barents Seas. Both the Norne and Snow White fields were discovered by exploration in Harstad.

Secondly, the fact that development and operation patterns include areas of the continental shelf further to the north is in itself a driving force. The spread of the petroleum industry along the Norwegian Continental Shelf has directed focus on the wider economic benefits that are included in the territorial diffusion of new activity. Discussions concerning the regional economic impact of new activities have, to a large extent, dealt with the establishment of development and operational organisations in the form of supply and operations bases. Discussions have also focused on the degree to which developers and operators have organized the systems for the allocation of contracts to subcontractors, so that local companies have the opportunity to

participate in the tendering process. The latter question has, to a high degree, dealt with the dividing of the work and contract modules. The debates on impacts of developing the Snow White field have dealt primarily with the economic benefits that arise in a region without the attraction of industrial milieus, or regional impacts of a field development in what is referred to as a “follower region”.

3.0 Growth Poles in “Follower Regions”

Theories concerning the formation of growth poles and political growth pole strategies may be attributed to the French economist Perroux (1950). A growth pole is perceived as a grouping (or cluster) of activities around a core of dynamic companies or sectors that act as a catalyst for growth. Various geographical areas will be dominated by or reliant on the growth poles, but the development of growth poles is also a strategy for growth that a region must create in order to establish growth or to take part in new growth processes. The bases of this concept are notions about economic externalities, agglomerations, and connections, which are still central in terms applied today such as business clusters and regional innovation systems.

The notion of growth poles emphasizes the significance of certain key industries and the connections these have both backwards and forwards in the value chains, including other companies and industries. In a Norwegian context, petroleum activity has, without a doubt, acted as such a key industry with significant wider economic benefits for other industries. The notion of growth poles became extremely popular in the 1960s among regional planners who wanted to develop new growth centres outside established centres through the channelling of public and private resources to prioritized areas (Parr, 1999a, 1999b). The growth pole strategy challenged conventional perceptions that every new economic activity needed to be centralized and grouped in a certain number of huge centres. This also contradicted conventional regional policy based on distributing resources across the entire country.

Theories concerning the development of growth poles have been applied in comparative studies of the oil industry’s development in Great Britain and Norway. Cumbers (2000) claimed the Norwegian government was inspired by a growth pole strategy when it decided to accord the medium-sized West Norwegian city of Stavanger as the Norwegian oil capital, instead of the national capital Oslo. He also pointed to government support of the establishment of the subsea environment at Kongsberg; the establishment of Aker’s activity in Verdal; Shell’s development in Kristiansund; Statoil’s establishment in Stjørdal and Harstad; and state financial support of the North Norwegian ship building industry in the 1970s to develop itself as a supplier to the oil industry. According to Cumbers, these were state attempts to create new growth poles, and contrasted with the British government during this same period (to a large extent under the leadership of Prime Minister Margaret Thatcher) that followed a different strategy by allowing global (and British) oil companies to determine their own localisation and territorial strategies.

According to Cumbers (2000), the difference of strategy between the two governments was the main reason why the Norwegian supplier industry accounted for 46% of all development and operation supplies on the Norwegian part of the North Sea from 1979 to 1993, while the Scottish proportion of supplies on the British side of the North Sea off the Scottish coast was just 9% (Howie & Lipka, 1993). An argument could be made that such a direct comparison may not be made, as Norway is an independent country and Scotland is only one part of Great Britain; however, both have

roughly the same population and a coastline just a short distance from the new oil and gas fields in the North Sea. Owing to this similarity, Cumbers emphasizes the differences in the governments' role in territorial development strategies, as well as the importance of their role as agents between large global oil companies and regional communities.

Statoil made the decision to develop the Snow White field after the Norwegian government altered the taxation of this field due to its localisation in the Barents Sea. The reasoning behind this alteration was that activity at Snow White would be localized within the Norwegian action zone, which is a northern economic zone with lower taxation rates than in other Norwegian regions. This study analyses how the new development of the Snow White field impacted the central developmental features of Hammerfest as a regional growth pole. Hammerfest had a population of 9000 in 2002, which has since grown to 10,000 (in January 2012). Before the Snow White development, this "northernmost" city was long known as a centre for the Norwegian frozen fillet industry, which had exported product to the global market since the 1960's. Through analysing correlations between new industry and development in Hammerfest, the analysis is also related to Dicken's (2007) concept of "host economies". Of central importance is understanding how small local "stations" (Hägerstrand, 1970) are being transformed into territorial growth poles within a global oil arena.

4.0 Methods

The article is based on several data sources, including national demographic, employment, housing, welfare, and municipal economic register data from Statistics Norway (SN) allocated to municipality level; data from Statoil's subcontracting database, including 4899 contracts allocated by Statoil for developing the Snow White field¹; data from Statoil's database registering all persons entering the LNG facility on Melkøya²; two surveys conducted among young people at the upper secondary school in Hammerfest in 2004 and 2008 (average age of respondents was 18)³; and in-depth interviews conducted among staff at Statoil, Hammerfest Municipal Council, and Finnmark County Council.

5.0 The Snow White Field Development

The Snow White project is based on natural gas and condensate (light oil) from the field in the Barents Sea being transferred to receiving and processing facilities for liquefied natural gas (LNG) on the island of Melkøya close to Hammerfest. As development was occurring so far north, in an area with an Arctic climate, sparse population, and limited infrastructure, Statoil wanted to avoid too much construction work on Melkøya. Consequently, the development solution was based on prefabrication and much of the work took place overseas. The German company Linde was responsible for prospecting, purchasing, and construction management. They were also responsible for

¹This was the total number of contracts included in the field-developing project (2002-2008). The contracts were allocated to 2033 suppliers, 1633 were Norwegian. Sixty of the Norwegian enterprises were registered as belonging to Northern Norway, and all were interviewed in depth by the researchers.

²The database included 26,953 people who have carried out small or big operations in the development process (2002-2008).

³In 2004, 283 local youths answered the survey, and in 2008, 190 youths answered. The answers included 63% of the pupils at the secondary school.

construction of the cooling tower with cold boxes and heat exchangers, which is the core technology of a LNG facility. The Italian company Nuovo Pignone supplied the compressors. The Belgian company Fabricom and the Dutch company Heerema received the contracts for fabrication of equipment modules, pipe racks, slug catcher, and associated processing units. Dragados Offshore in Spain was responsible for assembling the processing facility, while another Spanish shipbuilder, Construction Naval, built the barge that was used to transport the entire plant northwards.

The main contracts connected with the offshore projects and the land assignments on Melkøya were also awarded to large Norwegian and international companies. The biggest drilling company in the world, the transnational company (TNC) Transocean, was the contractor for the boring operations, while the Norwegian-based Aibel was awarded the main contract for the subsea equipment. The TNCs Technip Offshore Norge and the Dutch Alleseas Marine Contractors were responsible for the installation of pipelines and cables between the sea-floor installations. On Melkøya, Afs Pihl Group was responsible for engineering works, construction of an export quay, and laying foundations, while Swedish Skanska and the Nordic Veidekke built the tunnel and administrative building. The Belgian company Tractebel handled building and construction of the storage tanks together with Swedish NCC. Norwegian Aker Kværner carried out the electrical and assembly works, Norwegian Kaefer IKM attended to insulation, scaffolding, and surface treatment works, and Norwegian Aker Stord had the main contract for assembly and mechanical installation workers. The development activities carried out by local companies included the building of access roads and tunnels to Melkøya, blasting and landscaping of the processing area, laying the foundations and casting of the storage tanks.

This is in all likelihood a “traditional” distribution of work in the global oil industry. The development of the field occurred through a mix of established global actors, Norwegian companies, and the use of local companies. Most of the companies engaged with development work were on guest visits to Hammerfest, involving primarily male commuters as workers. The suppliers brought their own staff or enlisted labour through recruitment agencies. As development was carried out during a national economic upturn, it was difficult to procure local and/or regional labour, so recruitment from elsewhere in Europe was conducted. Long-distance commuters were flown in and housed at the construction camp on Melkøya during the construction period, which at its peak (according to Statoil’s database) housed more than 3000 people. In other words, a common feature of many of the companies and accompanying staff was their arrival in Hammerfest and disappearance after only staying a few months. Their task was specific and required a minimal degree of contact and interaction with the regional business environment.

6.0 Local Transformation Processes

As demonstrated above, many people arrived and departed; nonetheless, changes occurred that might have provided the seeds of transformation into a new growth pole in the north. Changes are demonstrated in three arenas: 1) the private collective arena (i.e. the local company/business environment), 2) the public collective arena (i.e. the municipal council’s activities and other types of changes in the local public arena), and 3) the private individual arena (i.e. demographic and attitude changes). Table 1 introduces each of the arenas, and their associated data and concrete analyses.

6.1 The Local and Regional Private Collective Arena

Analyses of data from Statoil’s subcontract database demonstrated that the total value of goods and services delivered to the Snow White development project by the 60 companies registered in Northern Norway totalled 480 million USD, which amounted to 6% of total deliveries and 9% of national deliveries. Of this amount, companies in Hammerfest (host community) and in Alta and Kvalsund (neighbouring communities) accounted for the largest share (300 million USD). Companies in other parts of the county of Finnmark accounted for 10 million USD; companies in the neighbouring county Troms accounted for 86 million USD; and companies in Nordland (the third county in Northern Norway) accounted for 58 million USD. The total cost of development of the Snow White field was nearly 8 billion USD and included deliveries from more than 2000 companies. That only 60 enterprises belonging to North Norwegian acquired contracts for the field development demonstrates that the majority of local and regional companies did not notice much effect from the boom.

Table 1. Arenas Analysed, Concrete Analyses, and Data Utilized

Arena analysed	Analyses	Data
The private collective arena	<ul style="list-style-type: none"> ▪ Developing of local suppliers 	<ul style="list-style-type: none"> ▪ Statoil’s sub contracting database ▪ In depth interviews of local suppliers
The public collective arena	<ul style="list-style-type: none"> ▪ Developing of municipal capacity ▪ Regional policy analyses 	<ul style="list-style-type: none"> ▪ Public national data (SN) on municipal economy and gender relations
The private individual arena	<ul style="list-style-type: none"> ▪ Developing local employment, demography, housing markets, youths attitudes 	<ul style="list-style-type: none"> ▪ Public national data (SN) on population and housing. ▪ Statoil’s data on access for working at Melkøya ▪ National data (SN) on housing markets collected from real estate agents ▪ Author’s conducted survey on youths attitudes

Source: Author.

The in-depth interviews with the 60 regional companies demonstrated that the majority of these companies could be divided into three groups. First, there were local businesses with a weak connection to the petroleum industry, but their proximity to the development site brought them into the Snow White project. The construction work on Melkøya demanded comprehensive excavation works and the transport of large quantities of stone chip, gravel, sand, and concrete. Buildings were being erected and there was a requirement for power supply, transportation of staff, provisioning, cleaning services, security, waste management, vehicle repairs, etc. This created a significant market for excavation and building/construction firms in the local area. In total,

these companies accounted for the largest local supplies. However, other companies also received significant supplies without having any specific petroleum-related competence. A local electricity company erected power lines; a regional transport company provided transportation for staff; another regional company was responsible for security services; a local waste company became a sub-contractor of the European company SAR (Security and Rescue); and several local companies supplied tools, work clothes, and food.

Second, an increasing number of local recruitment agencies and equipment hiring firms were established. The high demand for skilled workers led to several recruitment agencies in the region concentrating on the hiring of labour for the major suppliers (i.e., they took advantage of an important bottleneck during the development). One of these companies trained 150 Russians in Norwegian language, culture, Health, Safety and Environment (HSE), and work routines.

A third group of companies had few contracts on Melkøya, but benefited from the public development and other expansion brought about by the Snow White project. Included was comprehensive building activity with the upgrading of schools, the construction of a new cultural centre, and a total upgrade of roads in the host municipality. Statoil also built a series of houses and new business premises. For several of the local companies, this became a more important market than the development in Melkøya, in which they had decided not to become too heavily involved. They assessed the Snow White project as not being particularly relevant, both in terms of the technology that was in demand and the tempo in which the contracts should be implemented.

Why were more regional companies not connected to the development? Based on the in-depth interviews, the region had some industry service companies that had good relations with the international oil industry, but which nonetheless did not become heavily involved in the Snow White development. Their previous experiences were connected with offshore projects involving oil fields in the North Sea, and this experience could not be converted to the Snow White development. In the Snow White project, most work took place onshore and did not include platforms or floating production units. Consequently, these companies did not have contracts with the main contractors in the Snow White development, nor were they part of their networks.

The triggering of few new collaborative efforts internally within the North Norwegian business sector has proven to be a striking feature of the Snow White development. Surprisingly, horizontal connections were not made between regional and local companies. Collaboration on demanding contracts should, as a starting point, reduce the strain on individual companies and increase the chances of being accepted. An important explanation for the lack of collaboration may be the large distances involved: the region's business milieus are small and their locations are dispersed, while the communication pattern is dominated by north-south connections between the major cities in other regions and certain centres in Northern Norway. The newly created collaboration constellations were primarily between the large supplier companies from the outside and local and regional companies in the north. Consequently, the local companies entered primarily into new vertical as opposed to horizontal connections, in which the region's companies came in as sub-contractors far down in the contract hierarchies. As such, the Snow White development confirms Dicken's (2007) analysis: the most important dynamic takes place between the developer and the large main contractors, while the regional companies play second or third fiddle (brought into a dependent relationship with the national and international companies).

The involved processes appear ambiguous; on the one hand, independent local companies disappeared and became part of larger groups. Through their satellites in peripheral areas, the well-established supplier companies recruited local labour included in a new organizational context. As a result, several local companies experienced the loss of important staff to the large companies. The entering companies were able to offer better salaries and working conditions and it became more difficult for local companies to retain capability. This was a major challenge for local companies as it was not easy to recruit new core staff locally. These processes pointed in the direction of a weakening local business environment and a shifting of regional power positions.

On the other hand, it was the connection to larger actors from outside the region that provided a springboard for many of the local companies. Without such a connection they would have been left standing on the outside and not been in a position to participate in the Snow White project. The new situation challenged size, capacity, and competence, and it dealt with reducing the distance from the centres where the most important decisions were made. It became more important for local enterprises to focus on building relationships with the large contractors than relying on achieving short-term deliveries. In relation to the Snow White field development, the acquisition of local companies into the project strengthened the local competitive position. Through such inclusion, local companies were subjected to external administration but generated greater capabilities through the installation of newer, improved systems and becoming part of larger networks. It is during the encounter with new industry, as opposed to other local ventures, that local companies underwent change; as a result, the newly arrived companies represent a contribution to the local business environment. Many employees were recruited locally, and were trained/gained experience within an activity that was not only in high demand at that moment, but which could also have long-term potential. According to Dicken (2007), this connection had a stimulating effect: the transfer of labour that occurred by virtue of the new businesses from outside the region collectively created a more competent local environment with greater opportunities to play a central role in the development of the Barents Sea as a new petroleum province, both globally and nationally.

6.2 The Local Public Collective Arena

During the period Hammerfest became a location in which men were more visible than women, and the municipality fell in the national rankings for gender equality (based on national register data). The conditions that determine gender equality in this national ranking between the 434 Norwegian municipalities include the share of 1-5 year olds in kindergarten; the share of women per 100 men in the 20-39 age group; the share of men and women with higher education; the share of men and women in the workforce; the average gross income of men and women; and the share of women among municipal council representatives. Hammerfest Municipality scored highly on the equal opportunity index from its inception in 1999 up to 2003; however, it fell in the rankings during the Snow White development period. This is attributed to three factors: the share of women per 100 men became lower, the share of female municipal council representatives fell, and women's share of the workforce also dropped.

When development of the Snow White field was initiated, the economic conditions for public investments and for developing public municipal services in Hammerfest were difficult. According to national data registries

on municipality economic figures, Hammerfest Municipal Council made investments totalling 4.5 million USD in 2000, which then doubled to 9 million USD in 2002 and to 60 million USD in 2007. Investment in the community school/cultural sector has been particularly important: since 2004, the annual investment in schools has been roughly 18 million USD annually, and in 2008 a new cultural centre opened at a cost of almost 50 million USD. Furthermore, in the period from 2002-2008, almost 20 million USD were used to develop new industrial areas. In total, the Hammerfest Municipal Council made investments totalling 230 million USD during the development period. Municipal investments during the development period were primarily financed through loans taken up by the council. In 2008 the municipal council had 250 million USD in loan. This number was so high that the council was forced to implement large budgetary cuts to the operation of welfare services in order to pay back the sum. However, Hammerfest Municipal Council also introduced a property tax to increase its income. The taxation started in 2003 and its objective was to increase the municipal income from the LNG facility on Melkøya. After the facility was completed in 2008, the annual municipal income from the tax was 25 million USD, of which payments from Statoil constituted roughly 20 million USD, and payments from other companies in the municipality totalled 3.5 million USD. During the development period, the income from this new property tax totalled 90 million USD.

The increased activity provided several visible effects in the city. The school and pre-school sector received a pronounced facelift, including the majority of primary and lower secondary schools having been renovated and modernized, new kindergartens built, and beautification work carried out in areas around the schools. The content within schools was also modernised, in some cases including the country's latest provisions in the field of information and communication technology. Another important effect was the building of a new Arctic cultural centre (officially opened in January 2009). Given its location and lighting, the new cultural centre was a spectacular addition to the local community and featured three stages, one of which was outdoors. A new waterfront promenade was also built, and city streets/road networks were completely renovated. It is these effects to which the heading of this article speaks, and which are argued to represent the most important local effects in the Snow White field development.

Developing the local public arena was closely connected to development work and policies on the regional level. In 2002, at the same time as initiation of the Snow White field development, the formal responsibility for territorial development processes was transferred from the central government to the Norwegian county municipality councils. In practice, this meant that county councils received financial resources from the Ministry of Local Government and Regional Development for supporting growth processes in Norway's regions. The question raised was how the Snow White project influenced the opportunities for regional-based policies to develop new strategies.

For several reasons the Snow White development posed a challenge to the regional policy. "Traditionally" regional development policies in many Norwegian regions, and particularly in the regions of Northern Norway, were connected to handling economic crises (i.e., to curb declines in sectors and closures of individual companies). The Snow White field development provided a growth impulse to the region (i.e., it raised questions about how the wider economic benefits could be increased). According to the in-depth interviews in the county administration, this was a challenge for the authorities of the region for several reasons. First, paralleled with the Snow White

development were many crises in Finnmark County that demanded regional resources (i.e., investments connected to strengthening the regional business environment in the new oil sector in Hammerfest did not measure up in the competition for regional funding). Second, in encounters with such development it proved easier for the state government to strengthen its own institutions/agencies as opposed to regional-based institutions. The governmental Industrial Development Corporation of Norway (SIVA), Innovation Norway, and the Norwegian State Housing Bank were significantly upgraded and supported after the start of the Snow White development. Finnmark County Council did not receive such government backing. Consequently, activity of regional governing bodies was concentrated on programme options in county-operated upper secondary school (turned in the direction of petroleum-oriented subjects), and major political activity connected with diffusion and increasing the number of exploration and production areas in the Barents Sea (the only way that the county council believed regional effect could be increased). The county council did not have financial or capability resources to generate new clusters in order to create growth beyond activity moving towards northern areas.

6.3 Effects for Private Individuals and Families

The effects on local residents were not only a result of growth in public and private sector activity, but also the impact of new economic activity focused on the arrival of commuters. The Snow White development involved a workforce from all over the world, attracting people to Hammerfest. Based on the Statoil access database that included 26,953 people, 8843 international workers worked in Hammerfest during the development period: 49% from Nordic countries other than Norway, 47% from other European countries, and 4% from countries outside of Europe. In addition, 18,105 workers from Norway were involved. This labour came from all of Norway's 435 municipalities, but there existed congestion from the municipalities in the local area and those in Western Norway where the Norwegian supplier industry was located. Incidentally, the entering workers experienced two challenges in Hammerfest: the organisation of work (no consideration of commuting needs) and accommodation situated too close to the work site (interrupting required rest time).

Despite such issues, local employment increased. According to national register data (2002-2007), the number of people employed in enterprises and organisations registered in Hammerfest increased by 33%, and by 13% among people registered as resident in Hammerfest. The difference between the two figures appeared due to comprehensive commuting to Hammerfest from other areas among the workforce involved in the oil based growth processes. The most important in numerical terms was the growth in public services by 11%, but growth in enterprises providing different types of private services (200%) and retail trade (120%) represented the most important relative growth. Growth in male employment was greater than for females (i.e., employment for men increased by 35%, and for women it increased by 18%).

The aforementioned figures reflect several conditions. The deliveries to the oil sector from local enterprises represented a high degree of service provision. This applies also to both local and national deliveries (Statistics Norway, 2010), where the purely industrial deliveries came from countries other than Norway. The employment growth also influenced population structure within the community. During the development period, the population in Hammerfest (according to national register data) increased by 500 inhabitants: equivalent to

the population decline experienced between 1997 and 2002. The municipality still retained negative net migration figures (i.e. there was higher out-migration than in-migration); however, this was to a higher degree age selective than before, in that the municipality experienced strong improvement in net migration in the 20-29 and 30-39 age groups (compared to minus 90 migrants in 1996, to plus 50-60 every year after 2004). This led to a dramatic change in the population structure, but also to large long-term effects related to increased birth rate. Moreover, new gender differences emerged in the population: prior to 2006 Hammerfest's population had comprised an equivalent number of men and women, and in 2008 the number of men outnumbered women by 155.

The demographic development, including changes to both the population number and structure, had consequences for the housing market. According to national register data, one private house was built in 2002, increasing to 230 houses in 2005 and stabilizing at 55 in 2008. Simultaneously, the number of house sales increased from 65 in 2002 to 110 in 2006, then dropped to around 100 in 2007. Statistic Norway estimates that the prices for one-family houses and flats increased from an average of 1800 USD per square metre in 2002 to 2600 USD per square metre in 2008.

The Snow White development project was therefore extremely positive for those who were already established in the local housing market prior to 2003, but created a higher threshold for first-time buyers. It is estimated that around 600 dwellings were sold in Hammerfest in the period 2002-2008. If we assume that the median size of these included a utility floor space of 100 square metres (Statistics Norway, Population and Housing Census 2001), the estimated total value increase that the house sellers realized in this period was equivalent to 21 million USD, and the total housing stock increased in value by 355 million USD. Combined with the figures for the increase in activity in companies and in the public sector, the house owners made major gains.

Finally, the 2008 survey addressing youths 16-25 years old demonstrated that more young people wanted to live in Hammerfest than was the case in 2004. Their perception of the city had changed in a positive direction. At the end of the development period, 14% of a sample of 185 young people saw a future for themselves in the city. The percentage was the same for men and women; however, it was the women who had the clearest change of perception in a positive direction during the development period. In 2004 just 4% of young women had this perception of their future, compared with 9% of men (total sample was 275 people). At the same time, the survey demonstrated a reduction in the perception that the Snow White development could provide them employment opportunities. In 2004, a total of 53% of young people thought that the Snow White facility could provide future opportunities for employment, but in 2008 this perception dropped to 47% (a sample of 185 people). These gender differences are interesting: among men the perception had dropped from 58 to 42%, while among women it had risen from 48 to 50%. In all likelihood, this change reflects the fact that employment gains primarily came in the public and private service sectors.

7.0 Features of Development in a Remote Growth Pole

The development of the Snow White field initiated local growth processes that resemble economic growth poles as described by Perroux. In this case, growth was created in a region that is peripheral from both a geographical and an economic perspective. The most important growth processes analysed included in the pole were i.e., deliveries from local companies to Statoil and its large suppliers of nearly 355 million USD, public municipal investments of nearly

the same level and a strong increase in the value of houses benefitting private house owners.

However, structures were generated behind these figures that also created local growth dependence on future oil and gas development. Horizontal connections and networks were not developed between local companies in the field development period (i.e. no new economic clusters were initiated by the local companies or forced by public development actors). Local companies developed their own separate vertical networks with large international groups, and public regional actors were required to use their scarce resources to deal with crises and reorganizations in other local communities or industries.

At the same time, increased local incomes were generated primarily through the municipality's introduction of new taxes addressing real estate. This in turn led to a higher level of local public activity, which in turn built up the capacity in the local public labour market. There was also a high level of activity in the private service sector of the type that must be located near the development, owing to the continual need for contact with activity at the site. The increase in activity in both the public and private service sectors was covered by the increase of the local workforce, which in turn was the reason for the large requirement for commuters within industry. This also led to the industry's level of local activity being determined by the activity of major global suppliers, and not by activity generated by a local industrial cluster.

The pattern demonstrated in this article also presents some challenges for development and formation of growth poles in the High North, as a result of the global oil industry moving northwards. Firstly, it depends on level of activity, including a steady increase in the opening up of new areas and allocation of new licences. The High North must be very attractive for oil companies if the activity in northern communities is to be developed. Secondly, it is extremely important that offshore fields encourage onshore activity (i.e., the receiving and processing of resources from the ocean areas). It is the onshore activities that create demand for public and private services. Thirdly, it is important that the municipalities recognize a need to create/provide good places of residence where migrants desire to move to and live. Communities that manage to attract and keep competent, qualified people need to be able to offer good services and varied social surroundings. When the oil companies and the major supplier companies make their choices concerning location, they must also take into consideration where their employees are willing to live. The renovations carried out on community institutions by the Hammerfest Municipal Council, achieved through the introduction of a property tax for the new facility, prove to be a very sound long-term investment even though the municipality currently has the highest debt per resident of any municipality in Norway.

The understanding of the processes that took place in Hammerfest from 2002 to 2008 were clarified in an article written by one of Norway's most famous journalists and published in one of the main Norwegian newspapers (N'jie, 2008). At that time, Statoil had tested the production systems and many problems had begun to arise, including Hammerfest being covered by soot emission from the LNG factory most of the days in October 2008. Despite these problems, a teacher in one of the city's primary schools pointed to renovated and updated school buildings and satisfied pupils, and told the journalist about the opening of a cultural centre, adding: "*This is Snow White*". For her, the Snow White field represented changes in the city (on land and in the civil community).

Time has passed since the development phase ended in 2008. The Snow White facility initiated its production in 2009, and now Statoil has roughly 300 people employed in the operation of the LNG production facility. Aibel, which holds the contract for maintenance and modification, employs an equivalent number. The Italian oil company ENI is now in the middle of developing the Goliat oil field in the Barents Sea. ENI's operation management and the operation of the maintenance of the installations have both been localized in Hammerfest. The extraction of the oil from the Goliat field has yet to begin, so there will be new local pressure on the demand for public and private services. Operation of the Goliat field commences in 2014. Consequently, the increase in activity upon which the development of a growth pole in the north is based is now present, and new research following the processes after 2008 has been launched and will be completed in 2014 (Eikeland, 2010a; Nilsen et. al. 2013).

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