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Chapter 2

Assessing Regional Policies

2.1. Evolution of regional policies in Norway

2.1.1. *Long-term development of Norwegian regional policies*[1]

Regional policy in Norway began in the post-war period in response to devastation produced by the conflict and, specifically, the need to reconstruct the northern parts of the country where damage to economic and social infrastructure had been very severe. Initial policy responses tended to be mostly local in scope, to answer immediate needs. In 1951, a more strategic view was introduced with the North Norway Plan, followed over the next decade by economic development measures in other parts of the country. By the early 1960s, the need for a central institution to co-ordinate the range of locally based business support schemes appeared. To this end, a Regional Development Fund was set up in 1961 under the auspices of the Ministry of Local Government and Labour. More generally, regional policy was seen as a way to balance government efforts to stimulate industrial growth in the south and east. As such, regional policy was closely linked to national economic planning, with the goal of ensuring a more balanced and equitable territorial distribution of national income.

During the 1960s and into the 1970s, the goal of ensuring uniform levels of service provision in all regions meant that narrowly defined regional policy measures came to be complemented by other government policies with broader regional development effects. There was reliance on central planning and an associated rapid increase in public sector employment in many peripheral regions, including in the state-owned sector. From the mid-1970s, budgetary and broader policy concerns meant that this top-down approach began to be replaced by bottom-up efforts, based on ideas of self-development and the mobilisation of regional resources. At the same time, there were broader trends to decentralise aspects of policy, giving local authorities greater input over funding.

By the mid-1980s and into the 1990s, policy had taken on more of a market orientation, with an emerging focus on endogenous growth, knowledge-based development and the stimulation of entrepreneurship. Concerns emerged from the mid-1990s about out-migration from the periphery, with associated welfare and development implications. Alongside these periphery-oriented issues, attention came to be focused on settlement patterns and broader territorial planning issues and on the role of the regional level in economic development (with the introduction of regional strategy

development and programming in line with developments within the EU). Regional competitiveness also became an increasing part of the policy agenda.

In broad terms, the post-war period has seen an initial policy emphasis on equity expand to consider also growth aspects and territorial planning, although equity considerations remain fundamental. In parallel, an associated widening of the spatial focus of policy from designated and mainly peripheral areas to a policy involving all of Norway's regions was developed, although the funding emphasis continues to be strongly in favour of peripheral districts and rural areas. A broadening of the instruments of policy from spatially targeted regional aids to measures in support of the business environment and more general policies with an impact on regional development took place at the same time. Lastly, there was a move away from policies developed and implemented solely by central government. This was carried on through the establishment of national implementation agencies (SND[2] in 1993 and Innovation Norway in 2004) and, also in the last few years, the regional distribution of significant policy funding.

The period has also witnessed important changes in the context for regional development. Whereas, in the early years, Norway tended to be viewed as a relatively remote country relying mainly on traditional resource-based sectors (fishing, agriculture, hydroelectricity) with a sprinkling of industry (steel, shipyards), it has more recently gained affluence and global influence through other natural resources (petroleum and gas). A second important contextual development has been the increasing importance of globalisation and associated competitiveness pressures in recent years. These new endogenous and exogenous factors have had a major influence on recent policy developments.

2.1.2. Recent policy developments[3]

The evolution of district and regional policy in Norway can be characterised by broad consensus and small changes. A new approach to regional development was introduced at the beginning of 2002, following a change in government at the end of the preceding year (Ministry of Local Government and Regional Development, 2002). The policy involved: a focus on balanced development, aiming for population growth in *all* regions; a shift away from selective, centrally administered, grant-based assistance in favour of broader bottom-up initiatives which reflected local needs and requirements; related, a regionalisation of regional development budgets and responsibilities; a greater stress on innovation, both nationally and in the regions; an emphasis on measures to improve the business environment (tax cuts, infrastructure provision) rather than on direct business aid; and changing administrative responsibilities for regional development (with the county level taking the lead in regional partnerships charged with developing and implementing

regional development plans). In line with this strategy, responsibility for economic development budgets (under budget heading 551.60) was devolved from the Ministry of Local Government and Regional Development to the counties from 2003. As a result, four-fifths of the Ministry's annual budget now goes directly to the counties.

In a related development, Innovation Norway was set up in 2004 to bring together the SND, the Norwegian Tourist Board, the Norwegian Export Council and the Government Consultative Office for Inventors. Its core aim is to support business and entrepreneurship in all regions of Norway, while helping to release the potential of municipalities and counties to contribute to innovation, internationalisation and promotion by partnership approaches with the private sector. Compared to SND, Innovation Norway has less direct regional support channelled through it, now that the regional aid budget is passed first to the county level. Nevertheless, Innovation Norway remains an active and important regional policy player, in particular through involvement in the development and implementation of regional development plans and in delivering support at the regional level.

The 2005 White Paper on regional policy[4] built on these policy developments and confirmed the new way of thinking about regional policy, by explicit reference to competitiveness concerns within traditional broader district policy objectives. It thus stated that "*The Government's regional policy objectives are to maintain the main features of the settlement pattern and to release the growth potential in all parts of the country. … The Government also emphasises that policy initiatives to achieve regional policy goals should also strengthen Norway's international competitiveness*." To achieve these objectives, a number of strategies were to be followed, namely: establishing a good macroeconomic framework for industrial policy; differentiating policy in the regions, based on decentralisation and co-operation; strengthening the basic conditions for growth regions; providing a suitable environment for innovation, restructuring, employment and profitable activities; and laying the foundation for good service provision and attractive areas.

Different from previous approaches, the 2005 White Paper on regional policy put an emphasis on innovation, regional growth and an all-country approach. The focus was on the promotion of regional development in *all* regions through the regional differentiation of policy. On the other hand, important traditional features of policy remained – in particular, the stress on maintaining settlement patterns and the continuing favourable treatment of sparsely populated and peripheral areas (the so-called "districts"). Finally, by linking population settlement issues to development of the industrial structure, the White Paper increased the importance accorded to city areas in regional policy. It not only sought to achieve a more balanced distribution of growth between city areas in different regions and between city areas of

different sizes, but also wished to see smaller and medium-sized cities in particular developing as both attractive living areas and as locations suitable for city-oriented businesses.

The new government formed after the September 2005 elections placed regional policy high on the agenda. A June 2006 White Paper (St.meld.nr.21, 2005-2006) had a similar broad coverage as its predecessor but, at the same time, underlined even more strongly the priorities of district policy, implying increased state support to sparsely populated areas.[5] Reflecting this, a particular focus of the White Paper is on strengthening the key conditions which underpin business development and stable settlement structures and the core role that municipalities can play in this. The White Paper further stresses the importance of traditional policy measures, including a differentiated social security concession in the most sparsely populated areas. On the other hand, it recognises that more general support to promote business development and potential is also significant. Amongst a range of innovation and enterprise-related measures, the proposal of the previous government to introduce a new innovation-oriented Centre of Expertise Programme was maintained.

The 2006 White Paper also emphasises the role of partnerships in regional development, the need for enhanced co-ordination across sector policies and the importance of infrastructure provision (especially for transport). In addition, it highlights the development of specific measures for the most vulnerable areas, those going through a restructuring process and/or experiencing a decline in population. The different policy emphases of the new government have been reflected in recent budgetary developments (see Table 2.1). In particular, there has been a very significant increase in local government funding, with 5.5% growth between 2005 and 2007. Regional development support has also been markedly enhanced; there was a 17% increase between 2005 and 2006 and a further 10% increase between 2006 and 2007, once reintroduction of the social security concession in 2007 is accounted for.[6] As indicated above, these allocations are coherent with recent

Table 2.1. **Ministry of Local Government and Regional Development budget 2005-2007**

(NOK million)	2005	2006	2007
Regional development	2 451	2 868	2 746
Local government	48 681	53 872	56 472
Housing and building	16 099	16 676	16 702
Planning and administration	262	149	182
Total	**67 493**	**73 566**	**76 103**

Source: Ministry of Local Government and Regional Development budget proposal, 6 October 2006.

statements relating to even stronger support for "classical" district policy measures but they do not represent a major policy shift as they are in continuity with the evolution of Norwegian regional policy, which is progressive. This continuity is also illustrated by the fact that the competitiveness concerns and policy measures of the previous government have been maintained.

2.1.3. Coverage of regional policy

Notwithstanding these various developments and policy shifts, there has been considerable and long-standing stability in the broad objectives of regional policy in Norway. This is confirmed by the three key policy objectives highlighted in the 2006 White Paper, the ambitions and challenges of which are underlined in Box 2.1 (St.meld.nr.21, 2005-2006): to provide equal living conditions across the country, to maintain the main features of the settlement pattern and to focus on and develop regional strengths. These objectives impact on coverage and delivery of policy, analysed hereafter.

In considering the coverage of regional policy in Norway, an initial distinction has to be made between measures which explicitly target regional

Box 2.1. **2006 regional policy ambitions and challenges**

Three policy **ambitions** are stressed in the White Paper:

- To give people a real independent choice in where they want to live; to give priority to communities with declining population and employment opportunities and to generate prosperity of all local communities.

Six specific policy **challenges** are highlighted:

- To trigger growth in all parts of the country.
- To provide access to quality services in every part of the country.
- To create a dynamic environment for new competitive businesses to succeed outside urban areas.
- To create optimism in the areas with declining population and loss of jobs by adequate support through a palette of regional and rural policy instruments.
- To make small towns attractive places to live and work (especially for young people and women).
- To make medium-sized cities attractive alternatives to large cities.

Source: St.meld.nr. 21 (2005-2006), *Hjarte for heile landet: Om distrikts- og regionalpolitikken.* (Ministry of Local Government and Regional Development, *The Rural and Regional Policy of the Norwegian Government* – summary in English), Report to the Norwegian Parliament, 2006, Publication number H-2190 E, Oslo.

development and those where the regional impact of policy (though often significant) is not a core policy focus. In the Nordic context, this distinction is often characterised as that between "narrow" and "broad" regional policy. Broad district policy comprises sectors where district policy is not the core policy element, but an important part of it, for example, in agricultural policy or transportation and communications policy. A third category is represented by policy areas without district policy components, but important regional impact, such as petroleum extraction and processing and activities based on the use of hydroelectric power. The corresponding components are developed in Box 2.2 below.

First and foremost, there is what is known as district policy in Norway. It comprises distinct elements discussed in Section 2.2. They include: the automatic award of the differentiated social security concession, with a view to reducing employment costs in designated sparsely populated areas facing permanent disadvantage; compensation for those areas where this concession was removed or reduced post 2003 as a result of conforming with EU-EFTA guidelines and practices; the provision of regional aid in designated areas; measures to support business development infrastructure; and targeted transfers to municipalities within designated aid areas. Also to be noted are specific measures to tackle issues relating to weak settlement structures – including aid for restructuring processes in the most vulnerable areas and support for projects relating to entrepreneurship which encourage young people and women to settle or remain in peripheral localities.

Within district policy, specific attention is given to the northern periphery. On the one hand, this takes the form of higher award rates than found elsewhere within the designated areas. On the other hand, additional measures are available in all or part of North Norway, including the aid package for the Action Zone of North Troms and Finnmark and the NT programme (for innovation and technology in North Norway). Extra municipal transfers are also made available via the North Norway Grant. The support package for North Norway is considered further in Section 2.2.

A third component of regional policy highlighted in the 2006 White Paper consists of more general measures to promote regional growth and competitiveness. Such support is reviewed in Section 2.3. This includes initiatives to improve development conditions for innovation, entrepreneurship and firm expansion (such as the provision of innovation-oriented business infrastructure and the new Centre of Expertise programme); investment-related support such as enhanced access to venture capital funds; measures to promote new firm formation and entrepreneurship; and the strengthening of the role of municipalities in local economic development.

Box 2.2. **The components of Norwegian Regional Policy**

A. Measures targeted explicitly at regional development (narrow regional policy)

A.1 District policy

Policy directed at sparsely populated and remote areas with long distances to population centres and large markets. Traditionally, target areas have been the designated aid areas. They are not simply rural areas, but include urban centres in the north.

A.2 Northern periphery policy (within district policy)

As the preceding, but targeted specifically at North Norway or, within North Norway, at the Action Zone of North Troms and Finnmark. Award rates are higher than elsewhere within the designated areas and additional policy measures are available over and above those provided elsewhere in the designated areas.

A.3 Measures to promote regional growth and competitiveness

Policy not targeted specifically at designated areas (all-region approach), but measures are often regionally differentiated (tailored to the specific requirements of specific regions). Such measures also often have an urban orientation, though this is not always explicit. They also extend to broader measures to make towns and cities attractive places to live and work.

A.4 Measures to co-ordinate the above policies and the sectoral and related policies highlighted below.

This includes policy co-ordination at the regional level (often via regional programmes and plans) and nationally (across sectoral ministries) as well as national-regional co-ordination.

B. Measures where regional impact, though significant, is not a core policy focus (broad regional policy)

B.1 Sectoral policies

Including policies related to health, education, transport, agriculture and fisheries, culture and tourism.

B.2 Fiscal equalisation

Broader transfers under the general purpose grant scheme with a view to facilitating equal service provision across the country by compensation of narrow tax bases and/or higher costs for public service delivery.

C. Policy areas without district policy components but with important regional impact

Petroleum extraction and processing; manufacturing activities related to hydroelectric power.

Source: OECD, from a presentation by the Ministry of Local Government and Regional Development, 2007.

A less explicit element of narrow regional policy is urban-oriented support.[7] While there is no specific urban programme along the lines of the Regional Centre Programme in Finland (see OECD, 2005e), the overall goals for regional policy make clear the intention to have towns and cities as attractive places to live and work. The Ministry of the Environment, jointly with the Ministry of Local Government and Regional Development has emphasised the need to integrate environmental concerns in urban planning and to enhance city centres through the Sustainable Cities programme.[8] Today it is the innovation and competitiveness components of regional policy that clearly have an important urban dimension as will be developed further.

Moving beyond narrow regional policy, many sectoral policies in Norway have significant regional implications. One example is transport. For decades, great weight has been put on the regional and rural dimensions of transport infrastructure. Under the most recent National Transport Plan (NTP),[9] one of the core objectives is to improve traffic flows within and between regions, so as to promote development of viable rural areas and growth-oriented housing and labour markets while meeting transport needs of business and industry. This involves improving the road system, facilitating the provision of ferry services, building new bridges and tunnels, removing infrastructure bottlenecks and ensuring the operation of the system of 28 regional airports (over half in the north and the remainder mainly along the western coast). Most of these airports serve population centres with poor surface transport links and significant travel times to the next airport.

Government support to different types of transportation is provided through purchase of commercially unprofitable transport services (passenger railways, ferry services and regional airline services) via competitive tendering, with attached public service obligations. In the case of airports there is cross-subsidising through a state-owned company (Avinor) that compensates deficits of non-profitable regional airports. A new NTP is in preparation for 2010-2019. In line with government priorities, it will increase the weight given to secondary state roads and to avalanche/landslide protection, thus further improving the viability of rural areas.

Agriculture policy also has clear regional implications. The most important production areas are situated in East and Mid-Norway as well as in Rogaland in the south. From a post-war focus on productivity, food security and improving farmer incomes, agriculture policy progressively incorporated environmental issues and rural development concerns during the 1980s and 1990s (Almås, 2004). The multifunctional nature of agriculture is now emphasised, including issues related to the viability of rural communities, environmental and cultural amenities and the sustainable use of resources (OECD, 2005f). Both agricultural policy and support schemes have rural (and

thus regional) development as a significant policy goal: regionally distributed production is an important strategy under agricultural policy.

Support schemes include price and production subsidies, support for organic agriculture, investment support, rural development programmes and environmental funds. An analysis of the regional policy component of agricultural support found that schemes aimed solely at regional goals were relatively small, accounting for only 5% of the agricultural support budget (Hegrenes, *et al*., 2002). This included regional price support to the milk and meat sectors to allow production to take place in more difficult and remote areas, including in the west and north. On the other hand, much of the remaining support has important indirect regional effects, with agricultural policy contributing significantly to employment in Norway's sparsely populated areas.

Fishing and fish farming, activities in which Norway is a world leader, also have obvious regional impacts, providing vital employment opportunities for local settlements in coastal areas, particularly in the north. In many Norwegian coastal municipalities, fishing and farming jointly explain the higher than average levels of employment in the primary sector. In 2002, fishing employed almost 7 500 people in Arctic Norway, 3.5% of the total employment of the area (Glomsrod and Aslaksen, 2006). Fish processing has traditionally been particularly important for the employment of women. Where such jobs are lost under the pressure of international competition, mostly from Asia, coastal communities can come under serious depopulation pressures. Fish farming is developing regularly and extending to new species but this high added value activity is not job-intensive, so it cannot constitute alone an adequate answer to economic downturn in coastal communities.[10]

The broader impact of sectoral policies on regional development is well-recognised in Norway, not only in respect of transportation, agriculture, fishing and tourism but also petroleum extraction and processing as well as manufacturing industries related to hydroelectric power (such as the metal and chemical industries and pulp and paper). Reflecting this, the 2006 regional policy White Paper analyses the impact of sectoral policies on district development. In addition, a new advisory sub-committee (Government Sub-committee on Rural and Regional Policy) was established in 2005 to strengthen co-ordination between sectoral priorities and regional development. Its permanent members include the Ministers of Local Government and Regional Development (chair), Fisheries and Coast, Modernisation and Administration, Cultural and Church Affairs, Agriculture and Food, Trade and Industry, and Transport. The establishment of the sub-committee was in response to policy co-ordination challenges examined in Chapter 3.

Coverage of policy implies examining the distribution of funding between different components. The regional policy budget of the Ministry of Local Government and Regional Development aimed specifically at the districts has ranged from NOK 1 billion to NOK 1.5 billion in recent years, Most of this relates to regional investment grants and loans and other forms of regional aid. Moving beyond such narrow district policy support, broader measures targeted at the districts account for between NOK 10 billion and NOK 15 billion annually. The most important items under this heading are the regionally differentiated social security concession, certain regionally targeted agricultural measures and municipal transfers to designated aid areas via the Regional and North Norway Grants. Finally, as discussed above, still broader forms of (sectoral policy) support have regional impacts but no intended regional targeting. While it is difficult to gauge the volume of such sectoral spending, it is estimated by the Ministry of Local Government and Regional Development to be some 10 times greater than broad district policy and perhaps 100 times more than narrowly defined district support.

2.2. Policy for peripheral and declining areas

Norway has a very broad spectrum of regional policy instruments at its disposal. The breadth of the policy response reflects the complex nature of the territorial challenges (see Section 1.4) and, in particular, the fact that many of Norway's problem regions are facing permanent hardship and disadvantage leading to population outflows and pressures on settlement structures. Setting this against the key policy objectives – especially, the aim to provide equal living conditions across the country and to maintain settlement patterns – it is understandable that there is a considerable focus on the transfer of funding to the most disadvantaged areas and on ensuring that such support is aligned with the nature and severity of the regional problem. The periphery index discussed in Section 1.4 has been instrumental in designating the chosen areas and in differentiating the available support to this end.

At the core of policy for peripheral and declining areas are the designated problem region maps. These have been developed under the 2007-13 regional aid guidelines which apply throughout the EEA and aim to control the award of national regional aid.[11] Under the guidelines, two types of designated area maps are potentially permissible. One relates to national regional *investment* aid designed to support the development of the most disadvantaged regions by aiding investment and job creation. The other concerns areas where the structural handicaps of a region are so severe that regional investment aid and related horizontal measures (including innovation-oriented support) are not considered sufficient to promote regional development and where regional *operating* aid is allowed.[12] Given the severity of the territorial challenges in Norway, both forms of aid are found. The differentiated social security

concession is an operating aid and is the most significant component of Norwegian regional policy (narrowly defined). It involves annual revenue foregone of NOK 8.5 billion. In contrast, the regional investment aid package has an annual spend which varies between NOK 1-1.5 billion. Also important for the peripheral areas are the spatially targeted Regional and North Norway Grants which transfer significant funding to municipalities within the designated areas, over NOK 2 billion per annum. Finally, there is smaller-scale support which responds directly to concerns about weak settlement structures. These various measures are considered further below, focusing first on those which apply across one or other of the designated (sparsely populated) areas and then on policy instruments targeted at the north.

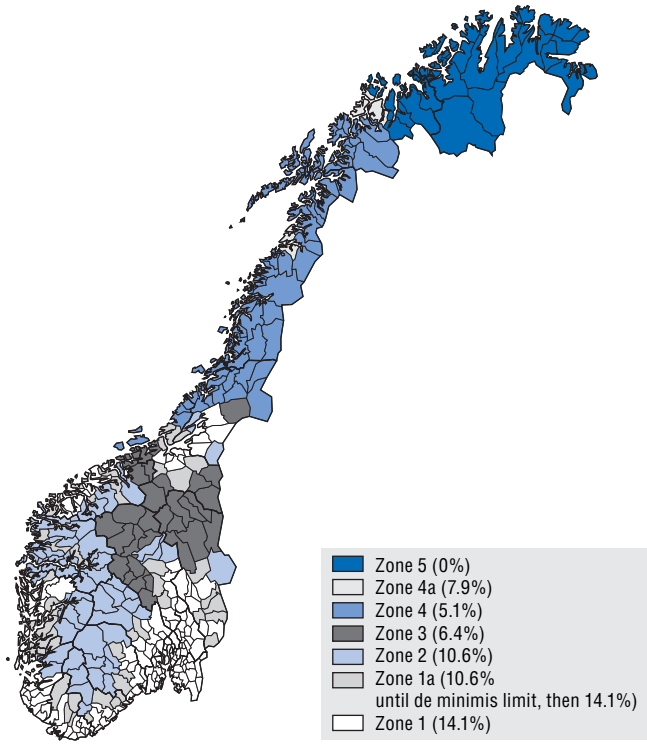
2.2.1. Policy instruments targeted at sparsely populated areas

Differentiated social security contribution and related support

A system of regional differentiated social security contributions was first introduced in Norway in 1975. Under the National Insurance Scheme Act, all employers must pay compulsory contributions to the national social security scheme. These contributions are calculated in relation to the gross salaries of employees, with a general contribution rate of 14.1%. By lowering this contribution in line with the perceived severity of the regional problem, the aim is to reduce or prevent depopulation in the least populated areas by stimulating employment and settlement in these regions through the reduction in labour costs (EFTA Surveillance Authority, 2006). Recipients of this aid are all undertakings and institutions (in both the private and public sectors) which are located within the designated eligible areas.

The designation of areas eligible for such operating support is restricted under the regional aid guidelines to what are known as the least-populated areas – NUTS II regions (and adjacent contiguous and smaller areas) with a population density of eight inhabitants per km^2 or less. More than this, the country concerned must be able to demonstrate that such aid is necessary to reduce or prevent depopulation. The areas designated on this basis in Norway are shown in Figure 2.1. They are centred on the NUTS II region of North Norway (population density 4.1 per km^2) as well as on the more remote parts of the NUTS II region of Hedmark and Oppland (the population density of these remote areas is 2.2 per km^2). In addition, adjacent areas, part of broader labour market regions not reflected at the NUTS II level, were added so as to integrate local differences that do not normally appear at the NUTS II level. Of note, these adjacent areas were all very remote from key centres, with a periphery index of less than 33.[13] The periphery index for all of those areas eligible for the full 2007-13 period (Zones 2 to 5 on the map) was just 37.5; this compares with 68.1 for Norway as a whole and 74.7 for those areas not eligible for the concession. Zones 2 to 5 hold just over 815 000 people, 17.7% of the

Figure 2.1. **Designated areas for the social security contribution 2007-13**



Source: Ministry of Local Government and Regional Development.

national population, and have an overall population density of 3.5, less than half of the prescribed limit.

Key features of the different zones into which Figure 2.1 is divided are set out in Table 2.2. The social security contribution rate is the full 14.1% in the

Table 2.2. **Award zones under the social security tax contribution**

Zone	Tax rate (%)	Aid intensity (%)	Population 2005	Population share (%)	Population change 95-05 (%)	Population change 00-05 (%)	Population density (per km^2)
1	14.1	0	3 790 982	82.3	8.0	3.8	42.0
2	10.6	3.1	204 075	4.4	–4.3	–2.2	3.3
3	6.4	6.8	96 617	2.1	–4.2	–2.0	2.2
4	5.1	7.9	315 743	6.9	–4.3	–2.1	4.8
4a	7.9	5.4	106 972	2.3	11.3	5.3	27.1
5	0	12.4	91 974	2.0	–5.1	–1.3	1.6

Source: EFTA Surveillance Authority, Decision No. 228/06/COL of 19 July 2006.

non-designated Zone 1 and then declines progressively until no contribution is required in the far north (Zone 5). Over the past decade, Zones 2 to 5 have suffered from broadly the same levels of depopulation (with falls of around 4-5%) and all have very low levels of population density. Zone 5 covers the far north – North-Troms and Finnmark. With just 1.6 inhabitants per km^2, further depopulation is an obvious threat to service provision and the overall viability of the region. Zone 4 covers the rest of North Norway plus adjacent areas to the south in Sør-Trøndelag and Møre og Romsdal.

While this zone also suffers from depopulation and low population density, the two main regional centres of Tromsø and Bodø (Zone 4a) have experienced significant growth. Nevertheless, they continue to be designated because of their importance as regional service centres and as engines of regional economic development. However, aid intensity is lower than in the rest of Zone 4. Zone 3 covers the outer periphery of southern Norway and mainly consists of mountainous areas. It has fewer than 100 000 inhabitants and no urban centres. Finally, Zone 2 focuses on the remaining peripheral areas in the south. Accessibility is less of a problem but depopulation and low population density are present. No urban growth centres are included within this zone.

At present, the differentiated social security contribution is in place under the 2007-13 regional aid guidelines. Norwegian authorities consider such support to be the most effective and efficient way of stimulating employment in rural and peripheral regions suffering from depopulation.[14] The advantages thus underlined relate to administrative simplicity, direct and substantial impact on employment opportunities and expected real income, with neutral application across sectors. Support, directly linked to the costs of employing persons in these areas of Norway, is automatic and transparent. The decisive factor taken into account is the location of the business unit. The scheme is designed to help limit depopulation of the designated regions in two ways: by reducing labour costs, thus increasing employment opportunities and by increasing the real income of residents. The importance placed on such support is reflected in the reaction to the ESA decision that it would have to be phased out from most areas over 2004-2007 as it did not appear to be compatible with the 2000-06 regional aid guidelines, after a similar scheme in Sweden was called into question by the EU.

First, compensatory measures were introduced for affected areas in the form of *de minimis*[15] aid of up to EUR 100 000 over three years to private sector firms; second, additional regional development funds were made available at the county level, to be managed by county-private sector partnerships (within standard regional aid guidelines and constraints); third, counties and municipalities were compensated for the increased wage costs they faced via the award of additional discretionary support under the General Purpose

Grant Scheme; and, fourth, a special national transport concession was introduced. These compensatory measures were considered to be fiscally neutral, maintaining the same levels of transfer to those areas previously eligible for the contribution.

In addition, looking forward to the 2007-13 period, a strong case was made to the ESA state aid authorities (subsequently agreed) to allow the award of such operating aid aiming to preventing depopulation. The new social security contribution comprises zones very similar to those which applied prior to 2004, except that Zone 4 has been sub-divided while Zone 2 has seen its coverage reduced. The previous contribution was available in areas holding 23% of the national population (in 2003), as compared to 17.7% currently. Although more limited in scope, the new scheme is estimated to involve revenue foregone of NOK 8.5 billion per annum, with some three-fifths of this benefiting the private sector.[16]

The Norwegian view is that if the scheme results in lower long-term labour costs, it will favour labour-intensive industry or production methods over capital intensive industries in these areas. In addition, it is considered that the scheme aims to favour new employment creation in the target regions, rather than in other regions. When the objective is employment of people resident in the specified Norwegian regions, labour subsidies are considered to be the most efficient measure. The conclusion of a certain number of Norwegian economists is that capital subsidies increase the use of capital and only indirectly increase the use of labour by greater production volume (Lind and Serck-Hanssen, 1972; Serck-Hanssen, 1984; Hoel and Ove Moene, 1987; Møreforskning Molde, 2001).

This type of support is also found in both Finland and Sweden (see Box 2.3), though only as *de minimis* aid. Research in these countries has not in general been particularly positive about the impact of such schemes on employment (see, for instance, Bohm and Lind, 1993 and Selvitysmies Raimo Sailaksen työryhmä, 2005). Norwegian authorities argue that the Finnish scheme was at the outset presented as an experiment, whereas a reduced social security tax can only have full effect when it is expected to be stable in the long run, so that business operators can rely on it when they choose where to invest and which technology to use. Concerning Norway, the results of empirical studies relating to the transfer of the differentiated rate of social security taxes to labour costs on the longer term varies.[17]

Regional aid and the regional aid guidelines

Under the 2007-13 regional aid guidelines, areas can be designated for regional investment aid purposes (see above) only if they meet certain criteria. In Norway, the key criterion was low population density – namely that eligible

Box 2.3. **Social security concessions in Sweden and Finland**

Sweden has operated regional social security concessions since the beginning of the 1980s. Following the decision not to approve such support for 2000-06, the Swedish government prepared a new act to allow future concessions to be awarded under the EU *de minimis* rule. Concessions were restricted to Aid Area A. The focus was on small businesses and support services in those parts of the country suffering from extreme geographical disadvantage. The maximum concession was EUR 9 500 for each employee per annum. Given the *de minimis* rule, support was most beneficial to small businesses.

Finland introduced, at the beginning of 2003, a waiver on employer social security payments in Northern Lapland and the islands under the *de minimis* rule as a part of a three-year pilot initiative. The report on the pilot (Korkeamäki and Uusitalo, 2005) concluded that employer costs were reduced by approximately 4%, though this had no statistically significant impact on regional employment. On the other hand, salaries increased in Lapland by approximately 2% more than outside the pilot regions. The waiver in the pilot regions was extended until 2009. In addition, a similar initiative was introduced in Kainuu for 2005-09. At the start of 2007, the pilot waiver was made available in Pielisen Karjala and in two municipalities in Eastern Finland.

areas should be NUTS II areas with a population density of less than eight inhabitants per km^2 or NUTS III areas with a population density of less than 12.5 inhabitants per km^2.[18] This gave Norway a population ceiling of 29.1% for its designated areas.[19] However, *within* this ceiling, there was some flexibility under the guidelines to enable parts of adjacent NUTS III areas to be included. An interesting feature in Norway is the extent to which this provision to swap areas was utilised. Only the three counties in the north – Finnmark, Troms and Nordland – and Sogn og Fjordane in the south-west were included in their entirety.

Municipalities in the counties of Hedmark, Oppland, Telemark, Aust-Agder and Nord-Trøndelag, holding just under 10% of the national population (445 006), were swapped out while municipalities in Østfold, Buskerud, Vest-Agder, Rogaland, Hordaland, Møre og Romsdal and Sør-Trøndelag, with just over 8% of the national population (374 739), were swapped in. Such fine-tuning was in response to the variations which exist in the nature and intensity of the regional challenge within certain counties. The concern was to ensure the inclusion of areas facing specific regional problems, in particular certain remote mountainous municipalities as well as island communities

and coastal areas facing accessibility challenges (see Ministry of Local Government and Regional Development, 2006). At the same time, some relatively healthy regional centres, with positive population developments, were omitted. A summary of these adaptations is provided in Table 2.3 below. It confirms that the swapped in areas were very similar to the designated areas as a whole in terms of population density, ongoing depopulation and periphery index value. In contrast, the swapped out areas had above-average population density, were experiencing population growth and were close to the Norwegian average in terms of peripherality.

Table 2.3. **Designated, non-designated, swapped in and out areas**

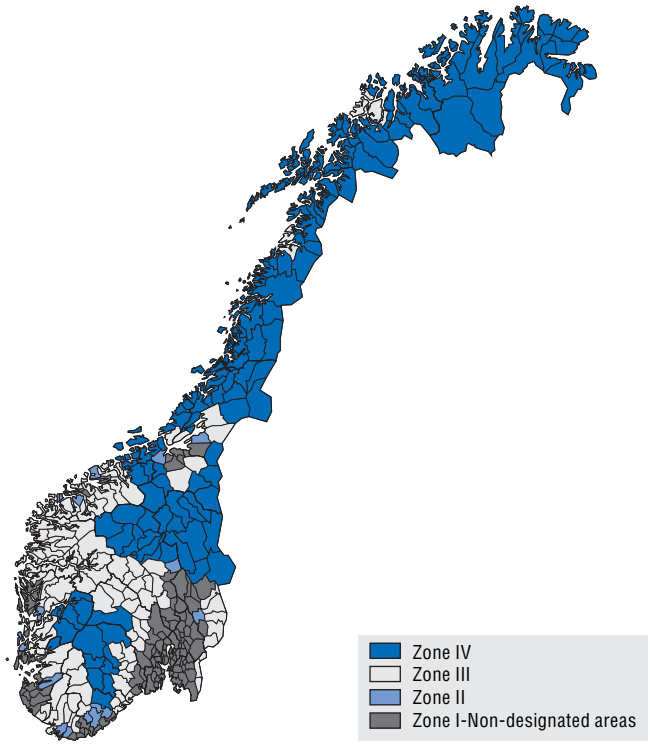
	Population 2005	Population density (per km^2)	Population change 85-05 (%)	Population change 95-05 (%)	Population change 00-05 (%)	Periphery index
Designated areas	1 268 515 (27.5%)	4.5	–2.9	–1.8	–0.8	39.9
Swapped in areas	374 739 (8.1%)	5.8	–4.0	–1.9	–1.1	39.6
Swapped out areas	445 006 (9.7%)	31.3	8.7	4.4	2.2	62.4
Non-designated areas	3 337 848 (72.5%)	77.9	17.6	9.2	4.3	78.9
Norway	4 606 363 (100.0%)	14.2	11.1	5.9	2.9	68.1

Source: Ministry of Local Government and Regional Development.

A map of the designated areas is provided in Figure 2.2. It covers 86% of the land mass, holds 27.5% of the population and differentiates between zones in line with the perceived severity of the regional problem. However, the degree of discrimination is less than under the 2000-06 map which distinguished between five zones (A, B, C, D and E), with no support in Zone E. In contrast, the current zones distinguish between four categories of areas. The proposed maximum rate area, Zone IV, is a combination of the former Zones A and B and also including eight municipalities from Zone C. It covers virtually all of North Norway (but excluding Tromsø and Bodø) as well as sparsely populated areas in the south. Zone III includes Tromsø and Bodø plus 24 newly designated municipalities in the south and west. Zone II is small, equivalent to the previous Zone D (where only advice and development support is available). Finally, Zone I, which lies outside the designated investment aid areas, is constrained geographically; even so, it holds 72.5% of the population (compared with 74.2% for Zone E over the 2000-06 period).

The maximum aid ceilings for Zone IV for the period 2007-13 are 35% for small enterprises, 25% for medium-sized enterprises and 15% for large

Figure 2.2. **Designated regional aid areas 2007-13**



Source: Ministry of Local Government and Regional Development.

enterprises. The respective maximum aid ceilings for Zone III are 5% points lower. This compares with maximum aid intensities over the 2000-06 period of 30% for SMEs and 25% for large companies in Zone A, 25% and 20% respectively in Zone B, and 20% and 10% respectively in Zone C. In addition, the aid intensity could be increased by a further 5 percentage points where the investment was expected to have a strong regional effect, except in the counties of Hordaland, Rogaland and Vest-Agder where the Zone C ceilings could not be exceeded. Given that the new maximum priority Zone IV is more extensive than Zones A and B combined, the new award ceilings are less generous for most large companies, but at least as generous for most SMEs that innovation policies under the responsibility of Innovation Norway seek to specifically support.

The regional aid package in Norway consists of regional investment grants and risk loans as well as the provision of advice and development support. These latter "softer" measures have been receiving more emphasis in recent years. The objective of regional aid is to contribute to the development

of viable and profitable enterprises in the designated areas. As mentioned earlier, regional aid budgets have been devolved to the county level since 2003. The size of the budget devolved to each county reflects the zoning in the map. Thus, in 2006, over two-fifths of regional aid spending was allocated to the three northern counties. Nordland, with just over 5% of the population, received 18.9% of the regional aid budget; Troms (3.3% of the population) obtained 12.1% of the budget; and Finnmark (1.6% of the population) benefited from 10.4% of the budget. Nord-Trondelag and Sogn og Fjordane were the other key beneficiaries, receiving 7.6% and 6.4% of the regional aid budget while each having less than 3% of the national population.[20] One last point to note is that the new regional aid guidelines allow the introduction of aid to stimulate entrepreneurship, permitting a wide range of support to small undertakings during their start-up phase. Serious consideration is being given to the introduction of such assistance in Norway.

2.2.2. Policy instruments targeted at the North

North Norway is, politically, the part of Norway which receives most emphasis and, in budgetary and expenditure terms, it is the area of maximum priority. This is seen clearly in the regional policy sphere where the counties of Nordland, Troms and Finnmark form a distinct area for many policy purposes. Like all areas in Norway with low population density and outward migration they receive specific attention as compared to other parts of the country but in those cases the highest support rates available apply, whether for the social security tax exemption or for regional investment aid. Besides, North Norway also benefits from tailor-made measures applicable only in that area: the North Norway Grant to enhance the quality of public services, the allocations or tax exemptions within the Action Zone of North Troms and Finnmark and lastly business support provided within the NT programme for the North.

North Norway as a whole benefits from the larger reductions in social security contributions in Zones 4 and 5 (see Figure 2.1). While no social security contributions at all are payable in Zone 5 (North Troms and Finnmark), the contribution rate applicable in the rest of North Norway is just 5.1% in Zone 4 (a grant-equivalent of 7.9%) and 7.9% in Zone 4a, Tromsø and Bodø (a grant-equivalent of 5.4%). In similar vein, all of North Norway, apart from Tromsø and Bodø, falls within the top priority Zone IV of the regional aid map (see Figure 2.2). As just discussed, the three northernmost counties also receive much higher levels of regional aid per head under the devolved regional aid budget while North Troms and Finnmark receive the most generous awards per municipality under the Regional Grant.

In addition, there are a number of specific economic development measures which are available only in North Norway. One is the innovation-oriented NT programme which is discussed in detail in Section 2.3. Another is

the North Norway Grant. This aims to give municipalities and counties in North Norway additional funding to allow them to provide enhanced public services. The rate of award per inhabitant varies according to the matrix presented in the Table 2.4 below, resulting in an overall transfer to North Norway of over NOK 1.5 billion per annum.

Table 2.4. **North Norway Grant in 2007**

	Municipalities (NOK per inhabitant)	Counties (NOK per inhabitant)	Population (2006)	Amount (NOK million)
Nordland	1 398	878	236 257	537.7
Troms	2 682	1 000	153 585	565.5
Finnmark	6 553	1 367	72 937	577.7

Source: Ministry of Local Government and Regional Development.

A third specific component of the regional policy package for the north consists of the Action Zone of North Troms and Finnmark. This was originally established in 1990 and was last reviewed in 2004 when Parliament confirmed the need for ongoing extraordinary measures for the region.[21] In addition to the zero-rated social security contribution (annual value NOK 1.7 billion), additional measures consist of reduced personal taxes (NOK 0.6 billion per year) and personal benefits: reduction of student loans (up to 10% of the initial loan) with a maximum award of NOK 25 000 per year (annual value NOK 0.1 billion); exemption from tax on household use of electricity (annual value NOK 0.1 billion); higher family and children's allowances (annual award NOK 0.1 billion); and specific benefits for pre-school teachers. The total cost of such measures is estimated to be around NOK 2.6 billion annually. Adding to this annual benefits for the Action Zone under the North Norway grant (estimated at NOK 590 million), the Regional Grant (NOK 145 million), the regional aid package (NOK 125 million), then just under NOK 3.5 billion per annum is involved. Spread over the population of the area (91 974), this amounts to over NOK 37 500 per person per annum, more than four times the spending per head across the designated areas as a whole.

The most significant policy developments in the north over the past few years relate to the High North (see Section 1.4.1). Policy for the High North (the Barents Sea region) has traditionally been sensitive internationally, raising issues relating to security, defence, foreign affairs, natural resources, energy and, of growing significance, the environment. With the end of the Cold War and the development of new opportunities relating to the area's large petroleum and gas reserves (in addition to its healthy fishery resources), the High North has moved to the top of the policy agenda. In March 2006, an important compromise was reached with respect to the development of the

area which balanced environmental, energy and fisheries concerns.[22] It identified where extraction could take place but also, importantly, where the focus should instead be on fisheries. In light of these developments, a new optimism has been created in North Norway. Translating this optimism into tangible developments of long-term benefit is an important current focus of Norwegian regional policy.

2.2.3. Policy issues and challenges

In Section 1.4, a number of clear territorial challenges emerged: difficulties created by terrain and climate, problems associated with sparse population and remoteness, related pressures on settlement patterns, the spatial dimension of sectoral developments; and globalisation. Resolving the policy tension between the need for international competitiveness and the desire for equity and stable settlement structures lies at the heart of territorial dilemmas in Norway. In response to such challenges, spatial targeting of policy is complex. There are designated sparsely populated areas for regional investment aid and designated least-populated areas for provision of regional operating aid. There is also significant differentiation within and between these designated areas. The regional problem in Norway is seen very much in terms of low population density, depopulation and peripherality, with implications for settlement patterns and service provision. The nature and acuteness of the problem is at its most severe in the far north but there are important differences between the three northern counties, municipalities and between regional centres and their rural hinterlands. Moreover, the territorial challenge extends beyond North Norway, with remote areas much further south suffering from low population densities and depopulation.

How has policy responded to these challenges? In terms of objectives, recent White Papers have seen stability and consensus around the three key goals of policy: provision of equal living conditions across the country, broad maintenance of settlement patterns and the development of regional strengths. Consensus across the political spectrum concerning tailored measures targeting different zones is such that little perspective has been given to support of local initiative aiming to lift the potential of identified assets. Present policy, more of a compensatory nature, is well developed by adequate funding that generous petroleum reserves provide. Even if the post petroleum era is yet far away, thought could start to be given more on measuring the overall efficiency and effectiveness of these policies. Strategic evaluations, effect analyses, benchmarking and cost-benefit analysis could be more systematically deployed to facilitate adaptation to variations in local circumstances.

Given the above, it is perhaps not surprising that the policy response has been a very broad one. Regional policy in Norway involves a wide range of

components. As discussed, it covers a variety of district policy measures (including in particular the differentiated social security concession) which focus on sparsely populated areas facing permanent disadvantage and hardship. Within this, additional support is provided for North Norway in the form of higher award rates and additional policy instruments, especially in the Action Zone of North Troms and Finnmark where support extends beyond business development to include reduced personal and household taxes. Innovation-oriented assistance is also an important component of Norwegian regional policy, with its stress on growth and competitiveness. While the urban dimension to policy is less visible, it is present within the innovation measures (with their inevitable focus on towns and cities with a critical mass of eligible activities) and is also reflected in more general policy developments. Finally, though not part of regional policy *per se*, the regional impacts of sectoral policies are clearly important in the Norwegian context.

Considering regional policy as a whole, a key feature of the Norwegian approach is that most funding flows to those areas experiencing the most severe problems, as reflected in the two regional aid maps (underpinned as they are by the periphery index). Thus, the benefits of the social security concession are differentiated through the different designated zones to favour in particular the far north and, less so, sparsely populated and remote areas further south. The importance attached to this distribution of funding is underlined by the decision to pay out compensation during the 2004-2006 period, to reflect exactly the losses borne by each area compared to the 2003 position. The North Norway Grant also distinguishes strongly by area in terms of its funding, with much higher per capita flows to Finnmark over Troms and Troms over Nordland. There is also strong territorial differentiation under the Regional Grant though, under this scheme, the main distinctions are between the far north and the rest of the country, on the one hand, and between smaller and larger municipalities on the other. Regional investment aid also has a clear spatial dimension, with far higher per capita regional aid budgets devolved to the three northern counties. Such funding flows are very much grounded in the key objectives of policy of providing equal living conditions across the country and maintaining broad settlement patterns.

The key policy instrument in funding terms is the differentiated social security concession which, at some NOK 8.5 billion per annum, accounts for a major part of narrow regional policy support. This has been a key component of policy for most of the past 30 years and is closely aligned to the objectives of achieving equal living conditions across the country and helping to maintain settlement patterns. It is valued particularly for its ability to address the problems of permanently disadvantaged areas facing depopulation by making sector-neutral support available in an administratively efficient way. However, the reverse side of this coin is that there is no pro-active element

to such support, no choice in how it is spent. This was thrown into prominence by some of the compensatory measures provided when the social security concession was phased out from all but the far north over the 2004-2006 period. On the other hand, there have been concerns about the additionality of some of the compensation provided and about the negative effects of territorial competition for resources in a situation where the distribution of funding is not automatic. With a heavy reliance on public sector resources and jobs, such competition is particularly strong in North Norway, both between counties and between municipalities within counties.

The other main form of automatic support is that channelled through the municipalities via the Regional Grant and the North Norway Grant. Together, these total over NOK 2 billion per annum. For the North Norway Grant, allocations are driven primarily by population and location (with by far the highest per capita support in Finnmark) while, for the Regional Grant, they reflect location (with the Action Zone for North Troms and Finnmark being favoured) and size of municipality (with maximum support for municipalities of less than 3 000 inhabitants). Viewed in tandem, such municipality support is clearly in line with the policy goals of providing equal living conditions across the country and supporting settlement patterns in those parts of the country where they are weakest. The fact that, outside of North Troms and Finnmark, the level of the Regional Grant is driven by size of municipality rather than by designated area location underscores the priority attached to supporting small rural municipalities.

Set against such automatic support to sparsely populated areas, discretionary business aid in the form of grants and loans is at a much smaller scale. The package of regional aid, combined with innovation support, amounts to less than NOK 1.5 billion per annum. An important feature of the available aid is that the maximum rate areas are now much more extensive than was the case in 2000-06, including sparsely populated areas in the south. This was a response to a view in Norway that insufficient use was being made of the support possibilities compared to the EU. On the other hand, a strong EU trend has been for business aid to become more selective, with maximum awards made only to projects which demonstrate the need for such support. While the wish to have the *ability* to award the maximum possible under the regional aid guidelines is understandable, it is equally important that aid recipients should have to demonstrate the need for aid case per case.

The breadth of the available regional policy support in Norway, combined with the desire that policy should reflect the different needs of different regions, creates considerable co-ordination challenges. These exist at the national level with respect to the different regional priorities of sectoral ministries; between the national and regional levels; and also at the regional (county) level. The establishment of the government sub-committee on

district and regional policy at the end of 2005 has been a positive development that certainly contributed to the sectoral component of the 2006 White Paper preparing regional reform. However, it remains problematic, in Norway as elsewhere, to try to ensure that sectoral budgets take account of regional concerns. Differing priorities of sectoral ministries suggest that national-level co-ordination will continue to be challenging. An interesting approach to overcome this challenge is that of Finland (OECD, 2005e) where 10 key sector ministries must define since 2004 regional development plans concerning their field of responsibility. These plans fit into the Regional Development Act guidelines defined by law in 2002 and the nine regional development targets adopted by government in January 2004.

Policy co-ordination between the national and county levels is also an issue. Such co-ordination is complicated by the major decentralisation of budgets and responsibilities to the counties in 2003, almost with "no strings attached". While other countries are also keen to give the regional level as much responsibility as possible, they tend to stress that national funding is involved and that there is thus a responsibility on the regional level to take national goals and priorities into account. This philosophy has recently been strengthened in the EU with the introduction of National Strategic Reference Frameworks which provide a context within which regional development programmes and plans can be set and judged. While it remains to be seen how effective the new EU system will be, it stands in some contrast to the current Norwegian approach. On the other hand, the upcoming reform of the regional/county level of government seems likely to provide an opportunity for this aspect of policy to be reviewed. Considered from an international perspective, there is certainly an argument for the introduction of more co-ordination between national objectives and regional priorities in Norway.

Finally, at the county level, a key issue concerns how policy is developed and implemented. Although there are regional development plans, and although these are meant to be based on county-led regional partnerships, the evidence is that they have been variable in terms of content and strategic vision and that they do not always reflect a genuine partnership ethos. If the goal of policy is indeed to differentiate between the different needs of different areas, then an agreed holistic vision of the regional challenge seems essential. This suggests that more attention will have to be paid in the future to partnership-based strategy development and implementation. This has been part of the regional reform process in Denmark and seems likely also to be reflected in future developments in Norway. One of the arguments for larger and more powerful regions is that they would be better placed to develop and implement holistic regional strategies. In circumstances where there is strong competition for public resources at the regional and municipal

levels, it is important for there to be an agreed strategic vision into which all concerned parties can buy.

2.2.4. Summing up

Foundations and vision of regional policy

The goals of Norwegian regional and district policy are relatively stable over time, reflecting a broadly based policy consensus aiming to provide equal living conditions across the country, maintain settlement patterns and to focus on and develop regional strengths. Because of their mutual impact, can competitiveness and equity concerns be better brought together, allowing synergies between the two to develop in a proactive fashion? Likewise, could stronger co-ordination more effectively take into account the regional dimension of sectoral policies? Likewise, in an integrated approach, the continued emphasis on settlement patterns, combined with the increasing importance of growth and competitiveness objectives suggests that the role of urban areas in regional economic development could be more explicitly recognised.

Cost efficiency concerns

Given the varied nature and intensity of regional challenges in Norway very significant funding will continue to flow towards designated regions via various automatic support mechanisms. Without challenging the volume of funding flowing to beneficiary areas, can support to major urban centres experiencing population growth build more explicitly on development aims for the wider region? How could the automatic character of many aid mechanisms leave room for more local initiative that would enhance the impact of such transfers? Can incentives be provided for projects on the basis of various criteria such as involvement of different sectors through partnerships or intermunicipal co-operation, creating a more competitive environment for the definition of sustainable projects? Likewise, systematic measurement of results and cost efficiency could introduce objective rules for further funding, meaning that the most value-added projects would continue to receive appropriate support while the least successful could be phased out on the basis of valid indicators.

Regional reform

Over the last few years counties have been receiving more leeway to develop their regional development strategies and forthcoming regional reform (see next chapter) will increase their powers. Will this opportunity be seized to bring closer together sector concerns and regional development aims, thus providing a holistic vision for regions within which added value

will appear? This entails requirements for effective vertical co-ordination, as policy delivery will be based on sharing of responsibilities between different levels of government. Increased horizontal co-ordination at the national level would also be required to oversee the smooth functioning of a new framework based on renewed principles of regional autonomy Could the government Sub-committee on Rural and Regional Policy created in 2005 be further strengthened to this end?

2.3. Regional competitiveness policies

2.3.1. Innovation and cluster policies

Evolution of policies

Innovation and cluster policies have evolved in Norway over the years. A report to the government in 1981 laid the foundation of major elements of Norwegian technology and innovation policies during the 1980s (Hauknes, *et al.*, 2003). These were based on strategic technology areas with a technology-push orientation but focus on the determinants and drivers for regional and local economic development was already at the time a policy concern. Small and medium-sized enterprises have also always been a prime target of innovation policies through STI (State Technology Institute), transformed into a private foundation with the objective to promote knowledge on technology and management for SMEs, renamed TI (Technology Institute) in 1988.[11] Emphasis on North Norway has been part of this policy picture from the beginning: the Service Office for industry for North Norway had similar functions to TI, with attention to the special needs of the northern parts of the country.

In 1993, the *Research Council of Norway* (RCN) was given a strengthened and formalised agenda that went beyond the role of a classical research council. Besides being a research council in the established sense, the new organisation was given the explicit task of being a central policy formulating and advisory body for national R&D and innovation policies. The 1990s also saw the establishment of the Norwegian Industrial and Regional Development Fund (SND). Like RCN, SND was established as a re-organisation and re-orientation of several pre-existing institutions, including the Regional Development Fund, the SME Fund and the Industrial Fund. SND's main task was to stimulate industrial development, by contributing to the development, modernisation and readjustment of Norwegian industry in general, and by promoting initiatives which would secure lasting and profitable regional employment.

Towards the end of the 1990s, interest in innovation and R&D policies stepped up. The Research Council became the institutional stronghold for innovation theories and was supported by the research department at the

Ministry of Education and by the research department of the Ministry of Industry and Trade. In 1999, the Research Council succeeded in creating an alliance with the Norwegian Industrial and Regional Development Fund (SND) and the Norwegian Export Council to promote the idea that Norway needed a new industrial strategy and that this strategy should be based on innovation. A White Paper on the Norwegian Industrial and Regional Development Fund (SND) was published at the beginning of the new millennium. It pointed to new challenges in the use of knowledge, research and innovation with the objective of developing framework conditions for viable industrial development in all parts of the country.

In order to achieve this, the White Paper argued that regional resources must be mobilised and connected to relevant competence institutions such as universities and technical schools and their networks. In parallel, the Ministry of Trade and Industry initiated an evaluation of the structure of business-oriented policy instruments and institutions. A proposal, based on the Ministry of Trade and Industry's investigation, was presented to Parliament at the beginning of 2003. It recommended uniting the most important institutions targeting innovation and entrepreneurship, with a new organisation – Innovation Norway – being established. The new body was created in 2004 by bringing together the Norwegian Government Consultative Office for Inventors (SVO), the Norwegian Trade Council and the Norwegian Industrial and Regional Development Fund, as well as the National Tourism Board.

Successive governments have regularly stressed the importance of innovation for maintaining living standards in a high cost economy mostly based on natural resources such as Norway. Innovation systems theory and clusters concepts such as developed by Porter are central to policy thinking. This has led to the establishment of several programmes and instruments to encourage networking and the distribution of knowledge and competence in various parts of the innovation system. This is assorted by an increased effort on R&D: the target is to raise total R&D spending to 3% of GDP by 2010, with public financing of R&D at 1% (the 2004 figures were 1.6% and 0.74% respectively, rising to 2.1% and 1% respectively if expressed as a percentage of mainland GDP; OECD, 2007a, p. 119). Innovation and cluster policies and programmes are to a large extent based on the triple helix model. The programmes can be divided in two categories:

- Core activity programmes focusing on developing clusters on the long term and in a holistic way. The foremost examples of this approach are the Arena and Centre of Expertise Programmes.
- Support programmes which focus on specific problems, needs and/or challenges within a cluster and/or between the firms in the cluster and outside actors, such as the Value creation 2010 programme.

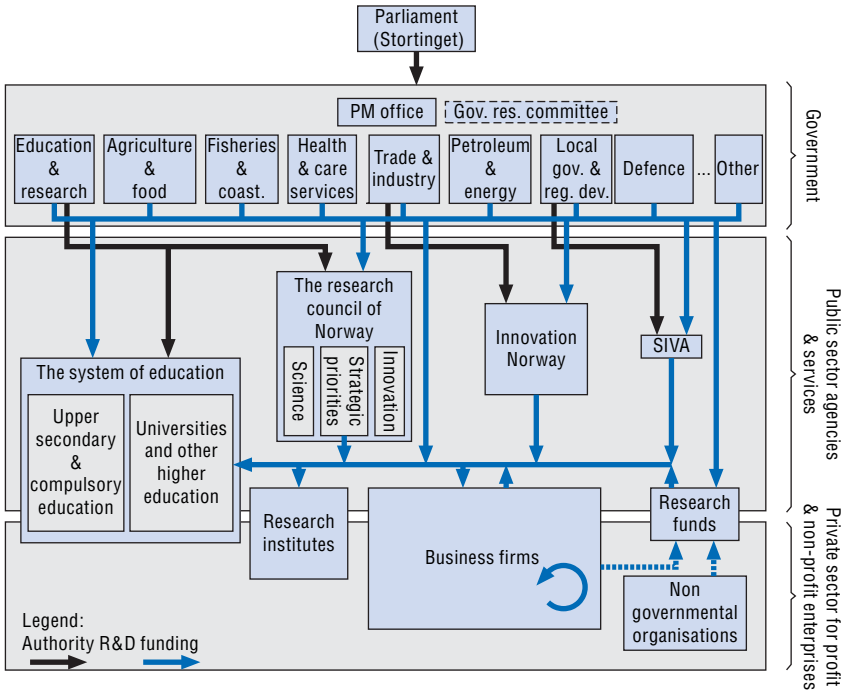
Policy framework

Major ministries

The policy framework for innovation in Norway, in which major actors from education and R&D participate, brings together many institutions: major ministries, public agencies, and the private sector. The complexity of the system appears in the chart below (Figure 2.3). It shows in particular that not less than eight ministries participate in the innovation process, which covers many different fields. Three ministries however have a central role in the development of national innovation policies:

- The Ministry of Trade and Industry, which is responsible for innovation and cluster policies in the broad sense.
- The Ministry of Education and Research, which is responsible for overall R&D policies.
- The Ministry of Local Government and Regional Development, responsible for innovation policies at the regional level.

Figure 2.3. **The Norwegian System for Education and R&D**



Source: Research Council of Norway (2006), *Report on Science and Technology Indicators for Norway 2005*, Research Council of Norway, Oslo.

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Policy co-ordination was ensured until the end of 2005 through two high level ministerial boards, one devoted to innovation issues and the other to research but these formal mechanisms seem to have been since discontinued. There are several parliamentary committees examining innovation and cluster issues, in particular the Standing Committee on Education, Research and Church Affairs, the Standing Committee on Business and Industry and the Standing Committee on Energy and the Environment.

Major agencies and other actors

Following reorganisation and rationalisation in the previous and current decades, there are now three major public policy institutions in Norway that help fund or encourage innovation activity in Norway: The Research Council of Norway (RCN); Innovation Norway and SIVA (Industrial Development Corporation of Norway). The different reforms aimed to give each institution clear and distinct mandates, with mutual co-operation ensuring a wide array of organised support to business development. Innovation Norway has a strong co-ordinating role with large variety of programmes and networks, while RCN focuses on research and SIVA on creating and maintaining the infrastructure required for innovation.

Innovation Norway (IN), organised as a state-owned company is the central body contributing to innovation promotion in Norway, employing more than 700 people. IN maintains offices in all counties and in more than 30 countries world wide. Funded basically by the Ministry of Local Government and Regional Development and the Ministry of Trade and Industry, but with important contributions from the Ministry of Agriculture and Food and the Ministry of Fisheries and Coastal Affairs, it is mandated to achieve national and regional goals in accordance with innovation policy. Total operating revenue in 2005 was NOK 704 million (Innovation Norway, 2006), of which NOK 501 million were allocated through the state budget and NOK 203 million was provided by external revenue, primarily from sales of services connected with marketing and internationalisation. National policy aims are followed through programmes like the Norwegian Centres of Expertise based on competitive funding and regional policy goals are pursued in co-ordination with regional councils receiving annual allocations for regional development.

More broadly, the stated vision of Innovation Norway – Giving local ideas global opportunities – is developed on the basis of a wide array of policy measures ranging from grants and risk capital, to business-oriented consulting and competence development, regional and national network services as well as internationalisation and profiling support. Innovation Norway thus backs and promotes in particular established and newly founded SMEs. The organisation provides or arranges financing and links enterprises to know-how, engaging in

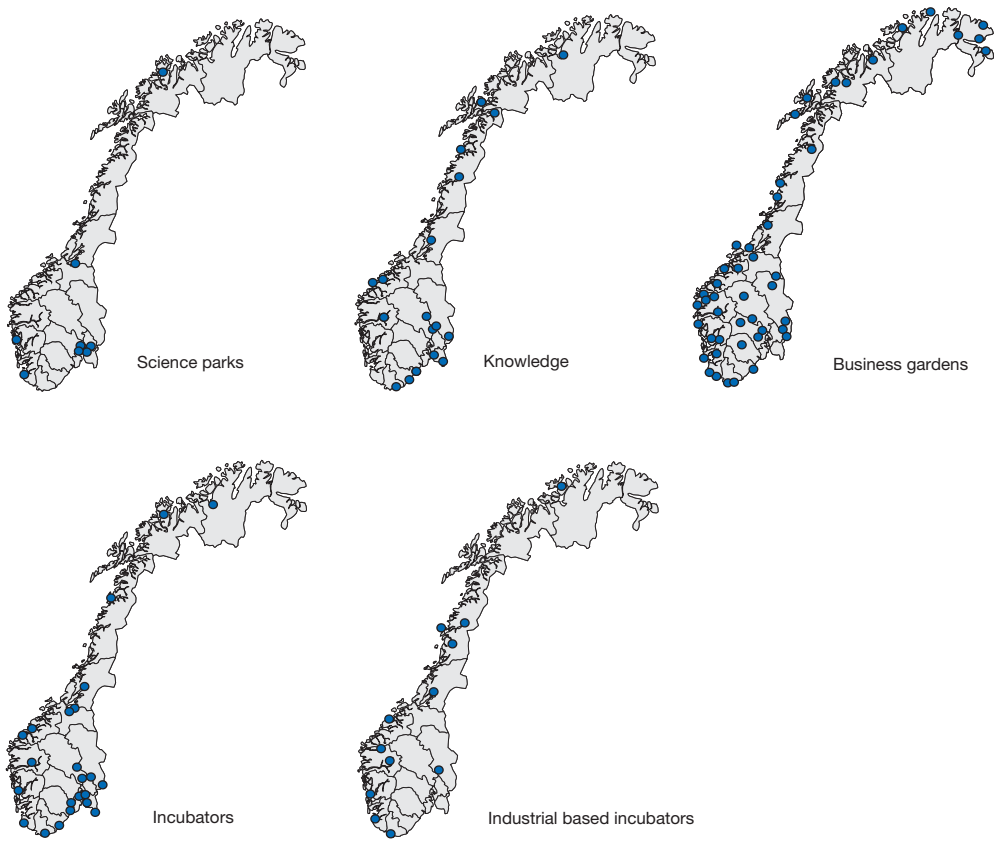
activities that range from simple business advice to financial schemes and hi-tech innovation. IN is a key central and county/municipal player in innovation in Norway playing a leading co-ordinating role in this area (see below).

The Research Council of Norway (RCN)[23] was formed by the 1993 merger of five different bodies; it is under the responsibility of the Ministry of Education and Research. Of its 2006 budget of NOK 5.2 billion (about EUR 650 million, or 0.25% of GDP), 20% was provided by the Ministry of Trade and Industry for industrial R&D projects, and 24% by the Ministry of Education and Research. The Ministry of Education and Research also allocates nearly EUR 200 million as return on the "research fund", making the Ministry RCN's largest contributor. The remainder comes from contributions of other ministries. RCN advises the government on research policy and is an important source of finance for publicly funded fundamental and applied research. It is a meeting place for researchers in the public and private sectors and co-operates in international research. It distributes as grants nearly 30% of public funds for R&D, after evaluation of projects. Among the instruments for supporting industrial R&D and innovation, the general and project-based innovation arena (user-driven innovation arena, or BIA) and related schemes are central.

RCN also helps to finance three types of innovation-oriented institutes. The newly created "Centres for Research-based Innovation" (SFI) aim at encouraging private sector R&D efforts via closer relationships between major research groups and R&D-intensive enterprises. "Norwegian Centres of Excellence" (SFF), of which 13 have been selected, are already-existing research groups, chiefly in universities, supported with the goal of underwriting high-quality long-term fundamental research. Lastly, RCN contributes to the financing of "Norwegian Centres of Expertise" (NCEs), together with SIVA and Innovation Norway. On the longer run, RCN will be focusing on financing long-term programmes (of approximately EUR 125 million each, annually over a 5-10 year lifespan) in the areas of petroleum resource management, clean energy, nanotechnology, aquaculture, climate change, ICTs and genomic research.

The Industrial Development Corporation of Norway (SIVA) is a public corporation founded in 1968. SIVA aims to develop strong regional and local industrial clusters through ownership in innovation infrastructure, investment and promotion of knowledge networks. SIVA's main objective is to support overall regional policy goals in terms of business development and knowledge dissemination, meaning that it is present in all the country, including remote areas. With an annual turnover of around EUR 30 million, SIVA has stakes in 150 companies and it is a co-owner of around 60 science and research parks and other innovation centres (see Figure 2.4). It advises on, and helps finance, the creation of networks between regional, national and international R&D units. It also helps to create industry incubators and supports the establishment of

Figure 2.4. **Innovation players in Norway**

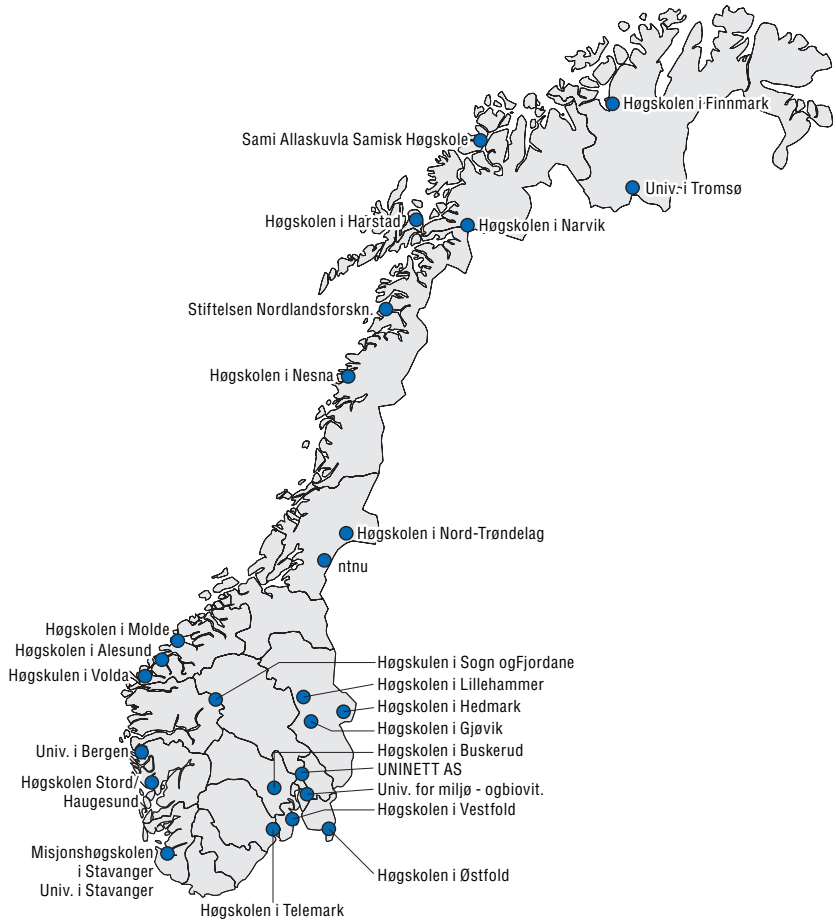


Source: www.siva.no.

new firms within these, often on the basis of start-up grants from Innovation Norway.

SIVA is the central player financing this infrastructure in which local government is usually the major stakeholder, jointly with other institutions (universities and technical institutes) and the private sector. SIVA's programmes covers business incubation (18 incubators in operation in 2006), business gardens (44), knowledge parks (SIVA, co-owner of all 15), and industrial and business parks (44 co-owned and operated by SIVA). This impressive network coverage brings forward a few major questions: are there enough financial and human resources in certain mostly rural areas to fully exploit the potential of this infrastructure and attain critical mass? Even if these institutions are under the same umbrella, is there sufficient co-ordination

Figure 2.4. **Innovation players in Norway** *(cont.)*



Source: www.siva.no.

and co-operation between them? An evaluation of SIVA conducted in 2000 (Wiig Aslesen, *et al.*, 2000) recognised the value of SIVA but underlined the danger of spreading its engagement to too many initiatives and brought forward the requirement of better developing innovation in traditional sectors. It remains to be seen which steps have been taken in these directions so as to improve the efficiency of this infrastructure in terms of promoting regional innovation, particularly in district areas.

Universities and university colleges

Before the Second World War, Norway had only one university, in Oslo. After the war, three new universities were established: in Bergen, in Trondheim (Norwegian University of Science and Technology, NTNU) and in Tromsø (Ministry of Education and Research, 2003). In the latter case, the aim was to develop North Norway so the decision clearly had regional development as its main objective. The following specialised university Institutions can also be mentioned: the Agricultural University of Norway (Ås), the Norwegian School of Economics and Business Administration (Bergen), the Norwegian School of Veterinary Science (Oslo), and the Oslo School of Architecture.

A Royal Commission appointed in 1965 paved the way for the establishment of new higher education institutions in the regions, facilitating access outside big cities and introducing new types of study programmes. Together with upgraded colleges of teacher training, engineering and nursing, these form the basis of today's state university colleges. A good number of these university offer programmes in general and pre-school teacher training, nursing and social work, frequently also decentralised or at distance (tele-education), to cater for adult students in the regions. Moreover, in 2004, the Norway Open University was established to stimulate the use of ICT, lifelong and flexible learning in Norwegian higher education.

Today, universities and university colleges are well spread over the whole territory of Norway, as the map above indicates, serving the whole country in education and innovation promotion. The contribution of these institutions to innovation is supported by various policy measures facilitating R&D links with the private sector so as to support transfer of ideas to market. One of the policy tools devised for this purpose is the "Mobilisation for R&D-related innovation" programme (MOBI), analysed further on. The HEI and R&D system as a whole is of course well anchored today in areas such as maritime/fishing or petroleum/gas expertise, the long-term challenge being to open up to other areas, in tune with the future evolution of the economy, in the post-hydro carbon period.

Governance of innovation and co-ordination

The Ministry of Trade and Industry ensures an overall co-ordination role in innovation policy, as indicated above. It collaborates with different ministries in working groups to guarantee cross-sectoral co-ordination. In spite of this, co-ordination does not translate into simplification of procedures for the financing of Innovation Norway that is the major player in these fields in the country. It's funding flows from many different sources, meaning as many different instructions on how to use the resources. However, the three

main agencies dealing with innovation (Innovation Norway, RCN and SIVA) do have a collaborative working agreement covering the period 2005-2007 (RCN, 2005). During this first period the signees have mostly engaged in close common dialogue with their beneficiaries, both public and private. They also strive to jointly provide practical information to firms through a common Internet portal (*www.innovasjonstjenester.no*). At the regional level lack of systematic co-ordination is also noticeable. Many regions still lack a truly comprehensive innovation strategy and in many cases the relatively modest role of innovation in regional development or city planning reflects this. The forthcoming White Paper on innovation will provide an opportunity to review these issues.

These different tasks with strong impact on policy delivery can be facilitated when an overarching body helps the government to define long term strategies and promote inter departmental co operation. Such is the case of Finland, where matters pertaining to research and innovation are scrutinised by a high level council in which major ministries and the scientific community are represented. The Finnish Science and Technology Policy Council, chaired by the Prime Minister, guarantees smooth co ordination within innovation related policies and activities. It comprises representatives of the Ministry of Education and Science, the Ministry of Trade and Industry, the Ministry of Finance in particular. It includes ten other members designated by the Academy of Finland, the National Technology Agency of Finland, universities and industry as well as employers' and employees' organisations.

Financing of innovation in Norway

The main source for innovation funding in the state budget is the Ministry of Trade and Industry (MTI). In the budget for the year 2007, MTI received an allocation of NOK 5 425 million (Norwegian state budget 2007, at *www.regjeringen.no*) of which NOK 1 107.6 million was channelled to Innovation Norway with an object clause of promoting innovative activity, and another NOK 31 million was channelled to SIVA with the same objective. The budget from the MTI to the Research Council of Norway was NOK 1 081 million in 2007. The Ministry of Research and Education is the second biggest financial contributor in terms of innovation spending, but it appears quite complicated to extract these allocations from the overall budget of the Ministry (NOK 87 360 million for the year 2007). Higher education, including universities, received NOK 20 921 million while the research budget in total is NOK 13 454 million. In 2007, the Ministry of Local Government and Regional Development allocates NOK 147 million to Innovation Norway. In addition, Innovation Norway administrates a substantial part of the Ministry's allocation of NOK 1 207 million to the 19 counties for the implementation of regional development strategies. Other ministries such as Transportation, Agriculture and Fisheries allocate funds to Innovation Norway as well.

Apart from public funding for different programmes through the main public agencies, innovation financing relates to risk capital in its different forms. Private players account for most of the risk capital on offer. The public seed capital scheme consists of several nationwide, regional and rural funds, supplying early phase projects with funding and professional advice. All are based on the same principles: Innovation Norway contributes with subordinated loan capital and write-off funds. Nationwide Seed Capital Funds, co-ordinated by Innovation Norway, provide NOK 667 million of governmental capital divided between the four major university cities. These nationwide seed funds are to mobilise private capital and advisory services to projects in the start-up phase and strengthen the commercialisation of research. There are also public Regional Seed Capital Funds set up in different regions along the same principles.

In 2006, specific seed capital funds were set up by Innovation Norway in areas of North Norway, to stimulate implementation of new business ideas. These rural seed capital funds target Nord-Trøndelag (Namsos), Nordland (Bodø) and Troms (Tromsø). These funds aim to increase the supply of seed capital and enhance economic development in areas where private financing is difficult. These funds are financed with 70% subordinated loan capital (NIBOR +0.5%) from Innovation Norway and 30% private equity capital. Twenty-five per cent of the loan is put aside in a loss fund. There is support to cover administrative costs during a life span of 15 years. The share of state loans is somewhat higher and interest on the loan somewhat lower as compared to nationwide funds. As these funds have only been created recently, it is too early to provide an assessment of their impact.

Another source of innovation funding is the Skattefunn tax credit scheme introduced in 2002. SMEs can deduct from payable tax 20% of their expenses on internal R&D projects not exceeding NOK 4 million each, or NOK 8 million if the R&D project involves collaboration with an approved R&D institution. Large enterprises can deduct 18% of equivalent R&D expenditures from payable tax. RCN must approve the project as falling within the definition of an R&D activity. Qualifying projects must generate new knowledge, information or experience that is useful for the enterprise in development of new products, services or processes. There are no regional or sectoral constraints. Enterprises that have insufficient, taxable income to use the full credit receive the remaining amount as a cash refund (74% of total tax expenditure was distributed in this way in 2005). Skattefunn is neutral between qualifying projects, regions and sectors or the tax position of qualifying firms. However, it benefits R&D in small enterprises or low R&D spenders more than in larger ones due to the ceilings. It has proved highly popular since its inception. The 2005 tax expenditure of Skattefunn was NOK 1.2 billion, about 0.06% of GDP.

Policy tools and programmes

Norwegian policy tools seeking to promote innovation and regional development are primarily based on a branch neutral support strategy. One key reason is the difficulty in picking winners among industrial branches; another is the flow of labour and capital resources between branches. This main picture must be slightly adjusted because the Research Council of Norway has several branch targeted programs in prioritised areas like the marine sector, the maritime sector and the petroleum sector in particular. This is also true for Innovation Norway's value creation programmes in primary industries. Another key feature of the various instruments, schemes and programmes is that they are often "demand driven", that is to say based on the initiatives of the entrepreneurs applying for support. On the other hand, the three national development agencies work intensively to stimulate entrepreneurs and enterprises, networks and industrial milieus to be potentially qualified for the schemes and programs.

Norwegian innovation policies and schemes are, to a large extent, based on a systemic view of innovation processes. An important part is the idea of strengthening the ability of companies to absorb technologies and know-how. This is an integral part of several schemes as identified by the STEP-group in 2003. As of today, there are several programmes which aim to promote innovation, clustering and co-operation between players (firms, R&D-institutions, development agencies, authorities). These programmes are mainly managed by the national developmental agencies (RCN, Innovation Norway and SIVA). Many of the programmes are co-financed by two or more ministries. Over the years, the national development agencies have developed a great number of schemes and programs, thus blurring somewhat the policy messages. Both RCN and Innovation Norway, recognising that some amount of simplification would be useful, are in a process of reorganising and reducing the number of schemes and programmes.

Norway also strongly emphasises clusters in its innovation policy, with a growing number of projects in this field that is developing world wide: during the year 2003 there were more than 500 cluster initiatives in different countries (Sölvell, Lindqvist and Ketels, 2003). The trend is recognition of the inherent advantages of clusters. The most common goals in these initiatives are networking that facilitates the sharing of ideas and promotion of innovation. Norwegian policy tools, building up on existing clusters (see Chapter 1), seek to enhance their performance while facilitating the creation of new groupings. In Canada, this kind of approach puts focus on regional development and on bringing different programmes together within a major cluster project (see Box 2.4).

Box 2.4. **Regional Strategic Initiative (RSI), Bas Saint Laurent Region, Quebec, Canada**

In the Bas-Saint-Laurent region of Quebec, Canada Economic Development (CED) is building on an approach that draws on broad consensus among the various local stakeholders and networking among teaching and research establishments and enterprises. Activities carried out under the Regional Strategic Initiative (RSI), launched in 1998, have been instrumental in creating a marine cluster. Centered on three types of activity (development and creation of SMEs, development of scientific expertise and development of a network to facilitate scientific transfer), this strategy has helped to provide the region with a nationally and internationally competitive research and technology transfer infrastructure. The creation of the *Technopole Maritime du Québec (*TMQ), an organisation devoted to the promotion of innovation, community facilitation and networking among marine institutions and enterprises, in 1999, was an important first step in promoting networking among partners in the community. National programmes that foster research and development (National Research Council of Canada and Canada Foundation for Innovation), those promoting regional competitiveness and economic diversification and a sound regional partnership allowed more than CAD 70 million of investment (public and private) to develop infrastructures supporting the marine industry which totals 3 600 jobs in the region.

The development of a critical mass of enterprises to position the industry on the national and international scene is still a sizeable challenge for an outlying region. To accomplish this, the Bas-Saint-Laurent regional action plan focuses on segments of the industry with strong development potential from a national and international standpoint and for which the region already has recognised expertise. Two sectors are targeted in particular: the marine biotechnology sector, including promising applications in the pharmaceutical, nutraceutical, cosmetic and environmental fields, and marine technology linked to electronic navigation equipment and marine information. As in the past few years, preference is given to a joint approach by various regional players and the promotion of strategic, growth-generating projects. These projects include the St Lawrence Global Observatory (SLGO), intended to improve access to data and information related to the St Lawrence ecosystem, and the Marine Security Centre, intended to improve the safety of the transportation network and Canada's maritime borders.

Source: Canada Economic Development, 2007.

As indicated above, the policy tools fostering innovation, clusters and regional development in Norway are numerous. Some are nationwide schemes that have no direct intended regional effects, others are deliberately focused on regional development in targeted areas, often of a rural character and experiencing economic downturn linked to out-migration. Some policy tools deliberately target hi-tech development in core sectors, while others aim to enhance knowledge dissemination in competitive environments or simply in counties by networking of knowledge institutions and firms in certain sectors. The policy picture is very diverse and efforts are being made to streamline the wide array of measures that sometimes overlap. It would be near impossible to present all measures and, in any case, the territorial development dimension of many is quite indirect. On the basis of these considerations, two categories of selected major policy measures only are presented hereafter:

- Nationwide schemes to promote regional innovation.
- Schemes and programmes targeting mostly rural areas and districts.

Nationwide schemes to promote regional innovation

"*Mobilisation for R&D-related innovation*" *(MOBI)* is a collaborative programme to create innovation clusters. It is an "umbrella" programme, implemented by the Research Council of Norway, with a total budget of NOK 38 million in 2005 and NOK 47.5 million in 2006. The main objective is to promote learning, innovation and value creation in companies with only minor R&D experience, which is the case for most SMEs. The programme puts a strong emphasis on regional innovation processes. MOBI comprises three sub-programmes: The Industry-College Collaboration Scheme (ICC), Research-based competence brokering and Arena.

The main objective of the *Industry-college Collaboration Scheme* is to create better linkages between universities/university colleges and industry in the regions. The scheme aims to strengthen the ties and mutual exchange of competence between SMEs and the public university colleges and to stimulate the regional capacity of innovation in both colleges and the industry. The main concept behind the scheme of *Research-based competence brokering* is that research communities may serve enterprises locally and regionally by working proactively with those that have little R&D experience and help to identify needs, analyze problems and suggest possible solutions by co-operation with research organisations.

Østerdalsskolen, a training programme carried out in co-operation between manufacturing companies and Hedmark University College (Department of Business Administration, Social Sciences and Computer Science), in the region of Østerdalen in Eastern Norway (Odden, 2006), is a

good example of this policy. The main objective of the project was to contribute to innovation and value creation in the participating companies. The main themes of the programme are: Health and safety, work environment, communication, productivity and innovation. Front managers in the companies were the main target group. According to the evaluation, the participants raised their consciousness and increased their understanding of the main themes of the programme, with some examples of behavioural change on the job. The programme also increased contact and collaboration between the companies that indicated their willingness to enter into another phase of work.

Arena, Innovation in Networks, is a national programme supporting regional cluster processes. The objective is to increase innovation and value creation in regional clusters and business communities by strengthening linkages and collaboration between industry, knowledge providers and the public sector. The programme targets regional clusters based on a concentration of firms and relevant R&D and knowledge institutions within a business sector, where there is a potential for strengthening the interaction between these parties. The programme offers financial and knowledge support to the planning and implementation of long-term development projects. The projects being supported, numbering around 20 today across the country, are based on regional initiatives and partnerships between the leading players of the cluster.

The Arena programme is a joint undertaking between Innovation Norway, the Research Council of Norway, and SIVA, with Innovation Norway acting as operator. Regional projects supported by Arena are incorporated into the regional development plans, so the county authorities are important co-operative partners. Arena has annually at its disposal approximately NOK 32-35 million. The main strategic goals pursued by Arena are the following:

- To establish networks that can facilitate development of relationships between the actors.
- To initiate network-based innovation projects and processes.
- To develop and implement competence activities to strengthen innovation capabilities.
- To develop and implement educational options and R&D activities better adapted to the needs of the business communities.
- To develop a more proactive and well co-ordinated involvement from the public sector.

The projects are based on regional initiatives and partnerships between the leading players of the cluster. The goals, strategies and implementation plans for the projects must also be customised to meet the specific challenges

and resource base of the cluster. The projects are organised with a steering group representing the partnership between the relevant groups and organisations and are carried out by a project team led by a project manager (cluster facilitator). Arena offers funding of the basic activities in the cluster projects. This largely includes costs of project management, workshops and networking, communication activities and a limited amount of consultancy services. The more concrete innovation projects originating from these basic activities are then funded through ordinary private and public funds.

An interesting example of efficient networking through Arena is offered by the Blue Light pilot project started in 2001 which is now evolving into a permanent venture between the partners. Blue Light is an information security project built on collaboration between firms in the field of information security, multimedia and e-learning. The project is co-ordinated by Gjøvik Business Park (Oppland county) in south-central Norway. Blue Light has resulted in the creation of several companies with different product launches in the field of information security. National scale development and co-operation are now being prepared. Other examples of activities organised under the aegis of Arena are provided further in the section related to innovation in North Norway.

The *Norwegian Centres of Expertise programme (NCE*) aims to initiate and enhance co-operative innovation and internationalisation processes in clusters with goals and potential for growth. The programme was jointly initiated at the beginning of this decade by Innovation Norway, SIVA and the Research Council of Norway, which are also supervising implementation. The goal of the programme is to strengthen the international competitiveness of regional industrial environments by developing their core competencies. The programme targets well established clusters with a high degree of innovation and with at least some firms already on the international market. NCE provides financial support for process management, network-building, idea and project development, internationalisation and communication, as well as professional support to internal learning activities, international dialogue and specialised seminars. The programme has a 10-year timeframe with 3.5-year contracts. The programme budget in 2006 was NOK 35 million and NOK 50 million in 2007.

NCE started with a pilot project in 2004 with a Maritime cluster located in Møre og Romsdal county, on Norway's south-west coast. The maritime cluster, consisting of 170 companies and 13 000 workers, is related to offshore activities, focusing specially on firms in boat design, ship equipment, ship-building, education, research and finance. The cluster focused efforts on increasing and enhancing co-operation between these different players. Another pilot project, to test the possible working of NCE, was started in 2003 in the Raufoss Technology Park (Oppland) presented in Section 1.4.3 above,

with a network of 50 cutting edge companies working mostly as suppliers for the automobile industry. The cluster focus is on material's technology (light metals, plastics and composite materials) and automated production.

In the first call for proposals of the new programme, in 2006, six NCE projects were selected (Table 2.5), including More og Romsdal and Raufoss. Four more National Centres of Expertise projects are to be selected through 2008. Amongst contenders for the first round, there was a project concerning Oslo and its region where cluster-based approaches are being developed by the main private sector firms (see further) within Oslo Teknopol. This project was however not awarded funding, definitely showing that project selection is not biased towards the capital city region, which is seeking to build up its international status. A new submission is planned for the next round of funding.

Table 2.5. **Norwegian Centres of Expertise selected projects 2006**

Sector	Location
Maritime	Møre og Romsdal (Møre)
Microsystems	Vestfold (Horten)
Systems engineering	Buskerud (Kongsberg)
Subsea	Hordaland
Light weight materials	Oppland (Raufoss)
Instrumentation	Trøndelag (Trondheim)

Source: Innovation Norway, 2006.

Value creation 2010 (VS 2010) is an applied research programme based on a partnership between the Confederation of Norwegian Business and Industry, The Norwegian Confederation of Trade Unions, Innovation Norway and RCN. The programme was initiated in 2001 and will run until 2010. The main objective of this programme is to encourage organisational development and innovation, both within individual enterprises and in learning networks between enterprises, based on new forms of co-operation between the industrial and social partners and other players in the value creation process. This is pursued by active participation of researchers themselves as development partners. The programme in particular supports development of regional innovation strategies within regional partnerships. VS 2010 had a total budget of NOK 25.5 million in 2005, and 24.3 million in 2006.

The outcomes of VS 2010 projects for companies[24] are considered as broadly positive (Arnold, *et al.*, 2005). There is wide agreement that projects have a positive influence on profits and a smaller one on employment. The programme has produced a considerable body of knowledge as well as a mechanism. Nonetheless, according to the evaluation, it does not transform

enough of the learning from the projects into tools that can be transferred to users, other researchers and professional "vectors" of development knowledge such as business development advisors and consultants. This means that the programme's spill-overs could be more developed. Also, the programme, tackling "soft" or non-technical innovation faces a cultural challenge: namely, to extend the idea of innovation from "technical innovation" to a more holistic one.

VRI, "*Policy instruments for regional R&D and innovation*" is a new programme including both MOBI and VS 2010 whereby RCN restructures and develops its regional policy instruments in a more decentralised fashion. It aims to promote regional innovation by strengthening R&D resources in the regions. The first programme period is 2007-2016, consisting of regional VRI programmes where regions will have freedom in prioritising the focus and the directions of use of funds. The first Call for proposals was opened in February 2007. The programme budget for the period 2007-2009 is NOK 302 million. The programme will seek to bring together regional and national strategies. The primary goal for VRI is to encourage innovation, knowledge development, and added value through regional co-operation and a strengthened research and development effort within the regions. VRI will focus both on company driven innovation activities as well as on strategic university projects and funding for competence building activities will also be allocated.

Schemes and programmes targeting mostly rural areas

Rural district development (BU-midler) is a scheme administered by Innovation Norway aimed at commercially oriented projects in connection with agriculture, especially agro-tourism. Prioritised areas of intervention are restructuring of activity, business and process development, ICT integration in business. A supplemental rural district scheme, administered by the county level provides financial support for the development of sustainable workplaces in agriculture and related activities. Rural district development resources (BU resources) can also be applied for in view of construction of farm buildings, in addition to financing with interest-bearing loans from private banks or Innovation Norway. Other programmes such as Value Creation target the primary sector, providing financing, consultancy and networking. Target groups are food producers: farmers, foodstuffs businesses and industry, logistics/sales, foodstuffs retailing, catering, restaurants and tourism. In the area of forestry, various subsidies were provided up to 2005. The objective was the increased use and higher conversion of timber. Lastly, the Marine innovation programme provides the same type of services as those mentioned above for other sectors. The goal is here the implementation of innovative

projects and value chain networking in order to strengthen added value and increase profit for businesses in the sector.

FRAM is a programme managed by Innovation Norway aimed at management and strategy development to improve competitiveness and long-term profitability of SMEs, including farm enterprises. The programme in particular gives many rural SMEs and farmers access to new management methods and efficient use of ICTs in business operations. During the programme period 1993-2002, an average of 53% of the participant companies were located within defined targeted district areas. This proportion has increased in recent years and reached 73% in 2003. Local marketing, recruiting and monitoring of participant companies, along with project definition and funding, are tasks that are accomplished by Innovation Norway's district offices in liaison with county councils, through county project managers in participating in the programme.

High risk loans can also be applied for by firms in rural districts. Such risk loans are used to finance projects where initial risks are high, with Innovation Norway intervening to evaluate the risk and provide advice. IN will look into project feasibility and the possibility of achieving profitability in the future. The risk loan service is valid throughout the whole country and can be given to small, medium-sized and large businesses, whether new or long-established businesses. The risk loans can cover most projects that are concerned with company establishment, new product development, reorganisation or expansion. The introduction of new technology and the implementation of research and development results are areas that can be financed with risk loans. Innovation Norway's risk loan cannot however be used to finance ongoing operational expenditure. In designated rural districts, the service can additionally cover investment in buildings, machines and operational equipment if such expenditure aims to increase efficiency, growth and co-operation.

A certain number of nationally designed business and knowledge infrastructure schemes managed by SIVA presented above actually benefit a large share of rural areas. 10 out of the 18 business incubators spread across the country were situated in 2006 in "assisted" (district) areas, which are essentially rural, even if they comprise urban hubs of various sizes. Likewise, industry incubators (on the basis of a new programme launched in 2004) are in majority situated in such areas (four out of seven in 2006). These contribute to spin-offs and the development of local sub-suppliers. The greatest part of Business gardens (knowledge-based groupings of SMEs in small communities) is also located in district policy areas: 35 out of 44 in 2006. Lastly, industrial and business parks are usually situated in district policy areas. This appears to be a rather specific feature of Norwegian innovation policy which is, alongside

the other programmes mentioned above, systematically geared towards innovation in very different environments.

2.3.2. Regional competitiveness and major urban centres

Urban growth challenges in Norway

Urban growth issues in Norway are set in a very particular context. The country is the second least urbanised one in the Nordic area, behind Finland (see Chapter 1). The capital city municipality has a population of more than 540 000 inhabitants, which is over twice as much as the second city municipality, Bergen. Only five municipalities have a population exceeding 100 000 inhabitants: besides Oslo and Bergen, this is the case of Trondheim, Stavanger and Bærum, which is part of the built up area of the Oslo conurbation. All of the major cities are located in the southern part of the country, the biggest city in the North, Tromsø, has a population of 64 000 inhabitants only. The Oslo Metropolitan area, depending on the definitions retained (see Section 1.1.2 above) comprises a population between 1.1 million inhabitants to around 1.6 million in 2006 in a country of close to 4.6 million inhabitants. All these major urban areas are growing, contributing to the national economy but also attracting people from sparsely populated rural areas and from the periphery.

The implications of this specific situation are numerous, particularly in terms of innovation. The first one is that Norway, contrary to most other countries, has never really had an urban policy *per se*, but rather that sub-elements of urban policies were found in other policies such as innovation where the urban dimension readily comes to mind. Urban policy was long defined as the policy ensuring balanced growth and social cohesion within a city and its area, meaning first of all measures to ensure integration in neighbourhoods where immigrant workers live and work, such as those taken in Berlin (see OECD, 2003c), amongst others. Nowadays, urban policy has also taken up another meaning in terms of policies aiming to promote broad city competitiveness, with a strong emphasis on innovation and cluster policies. Such is the case of policies developed, if one refers only to other Nordic countries, in Helsinki, Copenhagen and Stockholm (see OECD, 2003c; OECD, 2003a; OECD, 2003b; and OECD, 2006a).

Norway, up to now, has not developed such approaches. Integration of immigrants has not been a crucial issue as in other countries, because of a wider spread of these new inhabitants over the territory and well targeted policies aiming to facilitate the process (see Section 1.1). Likewise, natural growth of urban areas in the south does not seem to have justified policies fostering urban competitiveness, occurring largely on the basis of private sector intervention or as a result of specialisation induced by exploitation of

natural resources and a learning environment supported by renowned university institutions having further spurred the development of the local economy. Then why bring such issues forward today? First, integration of immigrants is becoming a policy concern, at least in certain parts of cities, particularly Oslo, where immigrants tend to concentrate because of lower rents. Second, the long-term competitiveness of the Norwegian economy, past the petroleum era, will depend on innovative capacity that concentrates largely in major urban areas and is investigated below.

Greater Oslo region

Introduction

The Oslo region concentrates between 20% to one quarter of the population in Norway depending on the definition of the metropolitan area retained and is enjoying a demographic growth rate of 1.12% per year over the past decade in its labour region (see Section 1.1.2). It regroups an impressive array of learning and research institutions, with 22 university and college institutions, 65 000 students and 75 R&D centres, including the biggest Norwegian Higher Education Institution, the University of Norway, which has an enrolment of 30 000 students. The Oslo metropolitan region also constitutes the only urban area of "European size" (Bundt, 2003), able to compete in the global economy with other capitals in the Baltic Sea region and it is fast growing, particularly since 2001 (+1.15% per year for the Oslo City region between 1996 and 2006).

This growth is not without bringing up a series of strategic issues that the forthcoming White Paper on the Oslo region will be investigating, with consequences on future regional reform. These issues are examined here in terms of impact on the attractiveness of the metropolitan area considered as an essential component of competitiveness. The design and implementation of globally oriented innovation strategies vying to comfort the position of the capital city area in the international arena rest on the prerequisite that the Oslo region continues to remain an attractive working and living place for creative professionals both from Norway and abroad. This is the case today but a certain number of recent developments could somewhat modify the picture.

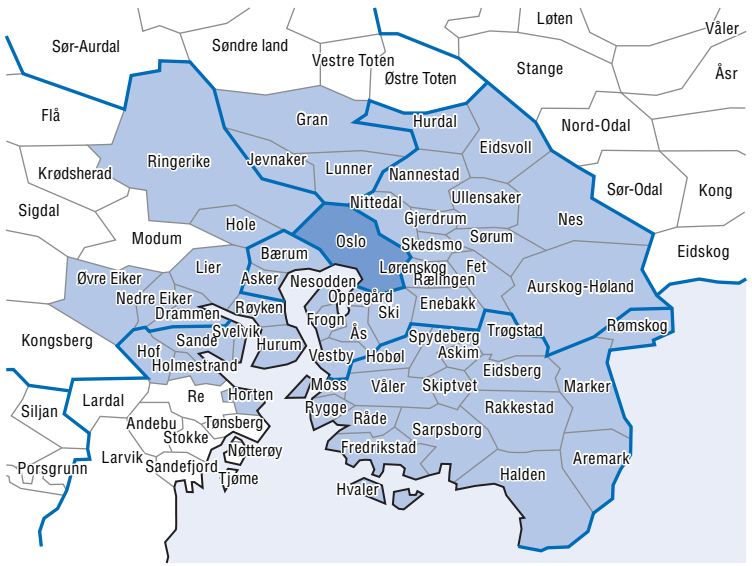
Immigration is one of these issues, with increasing concentration of foreign population in certain neighbourhoods, entailing new requirements in terms of infrastructure, renovation of housing and public services. Urban congestion is another, with increasing delays to access the workplace at peak hours. Important initiatives have been taken by Oslo county and city authorities, jointly with surrounding municipalities regrouped within the Oslo Alliance[25] (see Figure 2.5) to tackle these problems, on the basis of a long-term

"capital city project" strategy. The proclaimed strategic goal of the Alliance is to "strengthen the Oslo region as a competitive and sustainable region of Europe". Within this vision are the following four strategic areas:

- General development plans, transport and communication.
- Strengthening of competence and added-value.
- Strengthening the branding of the region.
- Developing co-operation to develop social infrastructure.

Governance issues are also at the fore as the Oslo Alliance is for the time being a loose grouping that only deals with the issues that its members decide to discuss. Future regional reform could bring about a more integrated region with formal powers but the geographical boundaries are subject to possible modification. In particular, if the Oslo Alliance acts today as a facilitator in terms of innovation issues discussed with the private sector within the cluster initiative (see below), it is largely devoid of the organisation and the funding to give a substantial thrust to its development, today ensured by major firms. The question of future national level involvement in these areas remains open, on the basis of possible future efforts to develop the capital city's competitiveness in the Baltic region by better exploiting its assets and surmounting its identified weaknesses (see below).

Figure 2.5. **Oslo region**



Source: Oslo Region Alliance.

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Oslo region competitiveness

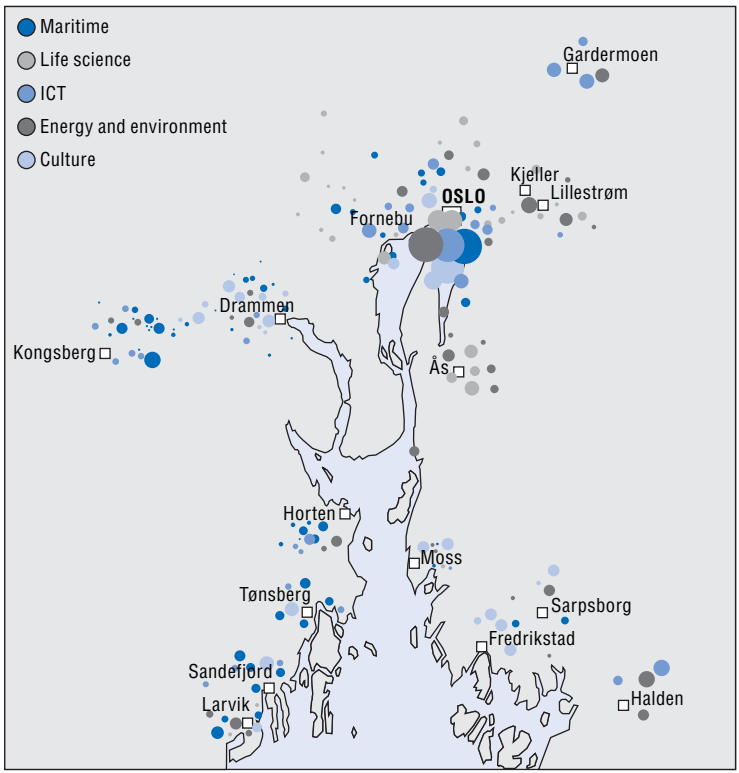
Oslo and its greater urban area constitute a major knowledge centre in the Baltic region, alongside Stockholm, Helsinki and Copenhagen. This position is reflected in the concentration of R&D and presence of numerous world academic institutions. Almost half of all R&D man-years and expenses in Norway are centred in the Oslo region (Oslo Teknopol, 2003). The private sector accounts for around half of this, with public research institutions, the university and university college making up most of the rest. Altogether there are 65 000 university and college students in the Oslo region, hosting 22 universities and colleges. The University of Oslo, one of the largest in Northern Europe (more than 32 000 students) has four Nobel Prize Laureates to its credit. There are 75 private and public R&D institutions, three science parks and numerous R&D-based companies in the area. 43% of those with higher education in Norway live in the Oslo region.

The greater Oslo region's business community consists of 90 000 companies, and the region lays claim to expertise within biotechnology, medicine and health, information and communication technology, and the energy and maritime sectors (Figure 2.6). More than one third of Norwegian growth companies are based in the Oslo region, which gives it the highest density of growth companies in Scandinavia (Oslo Teknopol, 2003). Oslo is also home to a strong financial community and is a preferred location for head offices and international companies. Cluster work, exclusively private sector driven at this stage, is based on intense networking and covers a wide area in and around Oslo. Some of these major clusters are presented below.

- ICTs

The plan to develop a national ICT, knowledge and innovation centre at Fornebu (10 minutes by car from downtown) was implemented in 1998, following the relocation of Oslo International Airport to Gardermoen. The facilities comprise a "knowledge village" and all the major ICT players in Norway are now located there. Telenor, the former historical operator, has brought around 7 000 employees to its new headquarters at Fornebu. Other key organisations are the Norwegian Computing Centre (Central Bureau of Statistics) and SINTEF, the largest applied consultancy company in science and technology in Scandinavia, with 500 employees in Oslo (Oslo Innovation Centre, 2006). SINTEF is a key actor behind the establishment of the Norwegian Micro-technology Centre, which is part of a national micro-technology programme and centres. Amongst other companies and research centres contributing to the development of Fornebu is the Simula Research Laboratory, concentrating on software engineering, communication technology and scientific computing.

Figure 2.6. **Greater Oslo business clusters**



Source: Oslo Teknopol.

- Biology

The Biological Research cluster situated in Aas, 30 km south of Oslo is centred on the Agricultural University of Norway. Biotechnology in relation to food science and food health is the major research area, developed by the Norwegian Food Research Institute (MATFORSK). Fish genomics and fish health is another focus field. The Institute for Aquaculture Research (AKVAFORSK) offers major competence in genetics, breeding, molecular biology and genome research. The Norwegian Crop Institute (PLANTEFORSK), the Norwegian Centre for Soil and Environmental Research (JORDFORSK) and the Norwegian Forest Research Institute (SKOGFORSK) are other central institutions at Aas, all collaborating closely with the Agricultural University. Furthermore, Aas BioScience Park has been established to generate commercially viable research-based results and knowledge-based project concepts and develop them into profitable business activities. It manages an incubator for this purpose.

- Energy

In the fields of energy and the environment, three institutions in the Oslo area underline specific expertise in highly specialised fields. The Norwegian Seismic Array has proven its great importance to petroleum-related activities on the Norwegian continental shelf and elsewhere in the world, through its research in seismic activity. The Norwegian Institute for Air Research provides national and international expertise in the fields of pollution and air research. The Institute for Energy Technology (IFE) is a powerhouse in a broad range of conventional and renewable energy forms, especially hydrogen research and solar technology. For more than 20 years IFE has been conducting research on the usage and storage of hydrogen. On this basis, plans for the post petroleum era are beginning to emerge with the "Hydrogen Road of Norway" that will link Stavanger to Oslo (560 km) within a few years with a continuous chain of liquid hydrogen filling stations. This project, conducted with research institutions located in other major Norwegian cities, aims to be the first of its kind in Europe, if not the world.

- Oslo competitiveness challenges

As indicated above, Oslo offers contrasting features in terms of competitiveness (see Table 2.6), with both outstanding assets in terms of a capital city of a country offering sound macroeconomic features, with an attractive environment and a good concentration of knowledge-based activities and a relatively young population. On the other hand, living costs are high,[26] and white collar salaries are not always sufficiently in proportion while congestion and transportation problems still remain. On the longer run, national level involvement in Oslo region issues that has been rather limited up to now will increase, on the basis of two apparently contradicting goals: the need to maintain balanced territorial development across Norway and the requirements of the global economy, with increasing competitive pressures from other Nordic capitals.

Table 2.6. **SWOT analysis of Oslo region**

Strengths and opportunities	Main weaknesses and threats
Sound macroeconomic conditions	Peripheral position in Europe, Stockholm, Helsinki, Copenhagen, dynamic centres in Baltic
An attractive environment	Low level of R&D in private sector
A high level of skills, a knowledge-based economy	High living costs, but comparatively low wages for highly skilled people
High innovation potential, clusters	Congestion, transportation
Population growth, young population, white collar immigration	Lack of effective metropolitan area co-operation: Greater Oslo region (Oslo Alliance) issues.
	"The most expensive city in the world"

Source: Oslo Teknopol, 2005, Capital City project, final report.

Lack of urban policy in Norway and hence, lack of targeted support for innovation in the capital city area can be explained by regional development priorities and recognition that Oslo metropolitan area development was occurring anyhow, if only by attracting new skills from other parts of Norway and also from abroad. It seems difficult to consider that these trends could continue without some delicate impacts on other parts of the country while not necessarily sufficiently comforting the competitive position of Oslo, at the service of the whole national economy. Oslo, and also other major cities are attracting talent from other parts of the country where an "internal brain drain" is somewhat occurring, whereas, in the face of competition with other capitals in the Baltic area, Oslo is not fully exploiting its potential (see below). Rather than just "letting things happen" in the capital city area, as was justified and mostly the case up to now, it would seem advisable to recognise fully the challenges arising from these conflicting trends. Developing innovation in the Oslo area can well be done while fostering innovation in other parts of the country if networking approaches are systematically pursued so that HEIs link up nationally on common projects and with the private sector across the country. Urban policy needs to be anchored in regional policy so that the impact of urban measures is fully integrated into regional policy concerns. Likewise, this would promote better understanding of measures required to support Oslo in the international arena in the wider national interest.

Challenges for Oslo in face of international competition are many. First of all, the slightly peripheral position of Oslo in the Baltic area puts it at a small disadvantage as compared to Stockholm, Copenhagen and Helsinki. In addition, the Finnish and Swedish capitals were ranked the top two innovation leaders out of 148 selected European regions (European Commission, 2006). Another handicap is the absence of national global hi-tech companies such as those existing both in Finland and Sweden that warrant continued research and attract international expertise. High cost of living in the capital city region can be another obstacle but rather high salaries in certain positions and quality of life can compensate for this, at least in part. To overcome these handicaps, while better leveraging its assets, Oslo definitely needs to adopt a vision for its future by adequately uniting strengths in the metropolitan area. Future regional reform and the above mentioned White Paper provide a unique opportunity to translate these considerations into policy measures conciliating regional development and international competitiveness perspectives.

Other major cities

There are also cities outside the Metropolitan area with a central role as knowledge centres. Besides, these cities are acting as knowledge centres and resource nodes in their respective regions and they have also a wider national

and international role in their field of expertise. Some of these cities even have strengths that make them compete with Oslo, for example in the field of the oil and gas industries. The challenge is, as developed above, to co-ordinate the network of centres of expertise and economic excellence, by promoting measures and incentives towards increased co-operation between the major city actors and with their northern nemesis, Tromsø.

Bergen

Hordaland county, of which Bergen is the capital, produces 80% of Norwegian raw oil exports (40% from the region of Bergen itself; City of Bergen, 2006). The second city in Norway is experiencing strong demographic growth: it registered the strongest population growth in Norway over the last five years (more than 1.20%) as demonstrated in Section 1.1.2. It possesses a complete cluster of suppliers to the major oil and gas companies, both Norwegian and foreign and has great expertise in the value chain of gas and petroleum, from consultancy and research to new production methods. Bergen also has a long history as a major harbour in Norway, with a commercial tradition dating back to the Hanseatic League in the Middle Ages, of which Bergen was a part. The port of Bergen is the third largest in Europe as for loaded volume and is dominant in the global market of transporting chemicals and other liquids. Also, the Bergen shipping fleet, with 346 vessels and 4.6 million gross tonnage is still today the largest in Scandinavia (Statistics Norway, 2006).

Bergen is also an international fish and seafood trade centre in Northern Europe, handling more than one million tons of seafood every year (City of Bergen). Norway's largest deep-sea fishing fleet and a great number of fish farms are located in the city's surroundings. Bergen is the Northern European centre for research within the field of marine science, with a number of world class institutes. The Norwegian Institute of Fisheries and Aquaculture Research is located in Bergen. In addition to the city's traditional leadership role in the marine sector, this big diversity of international level research expertise within the Bergen area, defines it as the only region in Norway with a complete maritime business environment.

There is a strong research environment and a high-tech industrial sector, both conducting international research. The University of Bergen (including Haukeland University Hospital) has an enrolment of 30 000 students. It boasts three centres of excellence: the Centre for Integrated Petroleum Research, Bjerknes Centre for Climate Research (BCCR) and the Centre for Medieval Studies. The Norwegian School of Economics and Business Administration is located there. Bergen University College also plays a major role: its focus areas are technology and the environment (underwater technology), welfare, as well as art and culture.

Trondheim

Trondheim is famous in Norway both as a historical city[27] and as home to the Norwegian University of Science and Technology (NTNU). NTNU is Norway's second largest university with more than 20 000 students and Sør-Trøndelag University College, with 8 000 students, is the third largest university college in Norway. The SINTEF Group, the largest independent research organisation in Scandinavia, has 2 000 employees and two-thirds of these are located in Trondheim. It undertakes research and development assignments in technology, natural science and the social sciences. Key focus areas in Trondheim are design, advanced engineering, innovative measuring techniques, complex analysis and control systems, industrial processing and materials engineering and new safety and environmental standards. Trondheim is also a centre for maritime, technical and medical technology research.

Companies are focused on the offshore oil and gas industry, exploration and sub-sea development and in operations in the North Sea. Trondheim is a major centre of expertise, with its companies linked to the Statoil control centre and service operators in Kristiansund. The city hosts major contractors working on off shore facilities, as well as research and engineering teams supporting the Snøhvit LNG development in the Barents Sea. Floating production vessels also operate out of Trondheim. The prospects of Trondheim are also strengthened by upgrading of mature industries and in particular the infusion of new production technologies and the introduction of new products and service enhancements. The metal industry collaborates with NTNU and SINTEF and in Verdal, Aker Verdal has been able to upgrade itself and to build new activities around it in an industrial village. The experience of the Oi cluster (food) initiative at HIST (the most important university college) may well provide a blueprint for initiatives that might nurture the renovation of many traditional sectors of the industry and public service (OECD/IMHE, 2006).

In Trondheim and its region, NTNU and SINTEF have been the sources of endogenous creation of new industry. NTNU has established a Technology Transfer Office operating since 2004. In a national perspective, the Trondheim community leads the way when it comes to new start-ups. A concrete goal was adopted to have 30 new firms based on knowledge established every year. Regional incubators such as the innovation centre in Gloshaugen also contribute to ease start up of new companies and bring entrepreneurs in touch with funding agents and industrial environments. Relocation to the city of the development units of international companies such as General Electric, Yahoo and Google has also strongly reinforced the ICT research cluster. In this dynamic environment, the city area population has been fast increasing, over the last five years in particular (see Section 1.1.2).

Stavanger

Stavanger, fourth city in Norway, is also the city with the strongest demographic growth rates (measured in labour region terms) in the country over the last ten years as has been demonstrated above. It has a central role in the petrochemical industry and food production in the country. The city has developed over the past 30 years into Norway's oil capital. A number of major companies in this industry are located in the region, as well as the Norwegian Petroleum Directorate. Offshore Northern Seas (ONS), which is one of the world's largest exhibitions and conferences for the petroleum industry, is held in Stavanger every other year. The petro-maritime industries and the food industry are areas in which substantial stakes exist in Stavanger.

The University of Stavanger is Norway's fifth biggest university (8 000 students). It is closely connected to the region's central businesses and research. A collaboration agreement relating to petroleum operations in the far north has been concluded by the University of Stavanger with the University of Tromsø (UiT), and two research institutes (the International Research Institute of Stavanger and Tromsø's Norut research group). The collaboration is aims to respond to the fact that one-quarter of the world's remaining hydrocarbons are located in Arctic regions by devising new technological solutions to exploit these resources, when exploration must be pursued in deep waters and special climate conditions, within a sensitive environment warranting specific protection.

Kristiansand

The population of the city of Kristiansand has been growing at an annual rate of more than 1% over the last ten years (see Section 1.1.2). It has expertise in offshore oil and gas technology, but it has also boasts one of Norway's IT and telecommunications clusters, based on Agder University College. Access to vast hydro-electrical resources in south-west Norway helped in the establishment of process industries in Kristiansand. The city is also a popular tourism destination in the summer for Norwegians and an increasing number of foreigners. The tourism industry is growing and is a key economic driver in the area.

The city of Kristiansand plays an important role in growth and innovation in the Agder region. Acknowledging this regional role, Kristiansand joined forces with its neighbouring municipalities (Lillesand, Birkenes, Vennesla, Søgne, Songdalen and Iveland) with the purpose of drawing up common goals and strategies on a number of important issues including business and economic development. This territorial co-operation is formalised through a grouping of local municipalities called Knutepunkt Sørlandet ("Knot point Sørlandet"). This group of municipalities works together for the benefit of

business and economic development in their region and beyond. It is a rather unique example in Norway and could be pondered as a method by other cities to support economic development by a shared strategy.

Tromsø

Although Tromsø is smaller than the other cities mentioned above it plays an important role in the development of North Norway (Nordland, Troms and Finnmark counties) as it boasts the only university in the area. It has been registering regular population growth over the past ten years, close to 1.20% yearly, in a position close to that of Stavanger, the number one city in Norway from this point of view. Its role is examined in detail further in this section, in developments relating to North Norway.

2.3.3. Rural/remote area competitiveness

Many peripheral areas of the Nordic countries played an important role in the industrialisation process, especially after the Second World War, when economic growth was based on abundant natural resources, cheap energy and a good labour supply (Virkkala and Niemi, 2006). In Finland and in Sweden, in particular, this situation gave rise to industrial giants in the pulp and paper industry and the metals industry. Although these industries continue to be important, the sources of economic growth have changed. Significant structural changes have taken place with the transformation of the Nordic economy in a knowledge-based direction. Public policies, especially science, technology and industrial policies, played a crucial role in this transformation process. The change to a knowledge based economy and towards a broadly defined innovation policy seems to be regionally and sectorally somewhat biased, that is to say it is focused more towards larger cities and universities than towards rural areas and small towns. This is definitively an important policy issue when thinking of ways and means to introduce innovation as a tool for fostering economic development in these outlying areas.

A substantial part of industrial and economic activity is located outside the larger towns and far away from major cities and capital regions. As global competition sets challenges that increase over time, especially in rural and remote areas that cannot access as easily as others global professional networks, can proactive attitudes towards innovation be relevant in these areas? Is it possible to consider innovation as a solution when the main issue is economic survival, often through large support from the national level, by a large share of public sector jobs in particular? Can innovation participate in these processes, to make them more efficient and enhance competitiveness of small local firms? Since out-migration of working-age people also decreases the number of individuals in a given area that would be more open to

innovation related activities, is the human resource base for innovation sufficient? The only answer to these major questions is a move away from narrow, R&D and technology oriented innovation definitions to a broader one taking into account all possible assets and strengths. Examples within Norway and from other countries presented below show that this is achievable and present valuable experiences in policy terms.

Leveraging local assets in lagging regions and/or peripheral regions

In many parts of Norway, natural amenities or natural resources are often the only choice for economic development, meaning that innovative approaches need to be applied to traditional sectors. In many cases, natural strengths and the corresponding local knowledge base have not been systematically identified and exploited. This process requires support from local government and knowledge institutions in a partnership type approach that can that lay the foundation for involvement of the national level through different innovation programmes. The example of the BioInn cluster in Hedmark around the town of Hamar, grouping more than 20 SMEs (see Section 1.4.2), illustrates such an approach. This rural area has been able to develop a globally competitive genetic biotechnology cluster, linked to agriculture and fish farming, exploiting both local and national know-how by linkages with other R&D institutions and participation in national innovation programmes.

When exploiting local assets, regional centres play a crucial role as contributors of know-how and other resources which are not easily available in lagging regions. Public players assume here the role of an initiator/catalyst to develop new activities in their area. This is the approach followed by the Finnish Centre of Expertise Programme, which aims to collect resources and top-level expertise to boost regional competitiveness. Within the framework of the programme there are examples of activities showing that expertise can be developed and exploited in rather peripheral regions, when the focus is on actual strengths of the region. In Finnish Lapland's case the central strength is in tourism. Local players, with the help of universities and R&D institutions, are integrating innovation into tourism products and promotion, by practically developing the concept of an "experience industry" (see Box 2.5). This is also a cross sectoral approach, with the tourism industry working seamlessly together with IT firms and public services.

Innovation policies at a small scale

When looking at the ingredients of innovation processes, the importance of various horizontal networking relationships cannot be underestimated. "Firm to firm" relations are very important and in some cases industry associations play a key role in different ways. Interactions with clients and suppliers

Box 2.5. **Finnish Centre of Expertise Programme**

The Tourism Experience Industry

The Centre of Expertise Programme plays an important role in a national growth strategy based on information and expertise. It is designed to pool local, regional and national resources to exploit top-level expertise. The programme supports regional strengths and specialisation and furthers co-operation between Centres of Expertise across the country. There are a total of 22 such centres in Finland, and they represent 45 different fields, ranging from biotechnology to cultural content production. The centres launch co-operation projects between the research sector, educational institutions, and businesses and industry. These projects boost competitiveness, strengthen and improve regional expertise, create new businesses and promote the creation of innovation environments.

The expertise developed in Lapland, from the centre created in Rovaniemi, the regional capital, is based on new forms of tourism, providing the visitor with an integrated experience comprising insights into local history, culture, traditions and way of life. The Centre of Expertise seeks to strengthen experiential elements in services and to promote new business activities where the experience is an essential factor of content and success. Product development projects launched within the cluster concentrate on producing new kinds of experience products through co-operation between different sectors: tourism providers themselves, new media, and the entertainment and design industries.

The Lapland Centre of Expertise for the Experience Industry, LEO, acts as a co-ordinator between these different sectors, helping to create the experience concept, promoting co-operation between experience producers, monitoring and analysing results. It also conceives related tourism development strategies and their promotion, in particular their dissemination within the local tourism industry. It has edited for this purpose a handbook for operators that is instrumental in the conception and implementation of such products. In the logic of the Centre of Expertise programme, the knowledge developed by LEO is open to other tourism areas in Finland. It is operated by Lapin Elämystuotanto Oy, in which the joint municipal authority of Rovaniemi and the University Foundation of Lapland have major stakes.

Source: Lapland's Centre of Expertise Programme 2003-2006.

produce new ideas as well as being important in innovation processes. Personal contacts are also a major source of information, ideas and advice. Generally, this can be called "everyday networking". The existence of various support organisations, as well as the perceived effectiveness of these

organisations influence the number of co-operative relationships which firms can be expected to have with such organisations. From this point of view, it is important to have effective arenas for interactions between the economic players in place. The number of co-operative relationships is probably not what influences the innovation processes the most, but rather how well the established relationships are functioning.

One central finding in a Nordic study on innovation systems in the periphery shows that, in most cases, R&D agencies as well as educational institutes seem to have a rather non significant direct role in innovation activities (Nordic Innovation Centre, 2005). At the same time the level of formal education within the firms (especially within the food industry and the tourism sector) is commonly fairly low. Therefore there is a need for targeted actions to be carried out in collaboration between firms and institutes that focus on general capacity building and education. Such institutes can also play an intermediary role, as elements of the innovation system, in linking general capacity building efforts to formal overarching knowledge infrastructure and raising awareness of innovation potential in companies and regions. Adding educational institutes to "everyday networking" can strengthen the innovation infrastructure in rural regions as well as support findings and develop innovations in peripheral areas.

One example of such a practical network including companies, R&D environments and the public sector is VIFU, the small food producers' network, located in Western Jutland (Denmark; Stoye, 2006). The network deals with practical co operation; network meetings, participation in food markets and market days, marketing of the producers in the network, planning and organising different kinds of arrangements and professional training for the producers in the network, planning and organising study tours for the producers, international contacts and teaching courses in "entrepreneurship in the food sector" in regional vocational institutions. In VIFU, the cardinal point for the network lies in human resources management. Decisive factors are timing, persons and matching in terms of having the right employees on the right tasks to meet users' inquiries in the best way, but also to find themes, projects and activities that catch their interest. Decentralised thinking, related to competences and project leadership, has presided to the organisation of VIFU, keeping the organisation close to where the small producers are located.

Helping these small initiatives to emerge, disseminating best practices and encouraging networking is clearly the role of a national facilitator organisation, with adequate funding completing local public or private financing. An interesting approach from this point of view is that taken by the Castilla y Léon region of Spain (European Commission, 2007) that established in 2002 a network of regional innovation agents to establish a link between

small, mostly rural and remote businesses and existing centrally located technological services. Twelve regional development agents from different academic backgrounds were recruited and trained to form the innovation network. Over two years, close to 1 000 companies were visited, 231 businesses were put in contact with one of six Technological Centres and 63 innovation projects were started in SMEs. The region continues to support the project since 2004 which saw the end of EU co-funding.[28] The project is run in partnership between the Regional Council of Chambers of Commerce and the Economic Development Agency.

In Norway, there is a wide spectrum of policy tools to promote innovation in rural areas (see Section 2.3.1 above) but these seem organised rather differently than the preceding examples. They are mostly sector oriented and delivered top down, although Innovation Norway plays an important role in counties by direct contact with businesses. With funding from many different sources and the county not having a fully holistic vision of development aims in its area because of the present sharing of responsibilities with municipalities on one hand and the national level on the other, fragmentation does not readily permit to benchmark the overall efficiency of different measures and ensure that they rather develop synergies than over lapping. Public Private Partnerships (PPPs) are also crucial in the success of the cases indicated above. These are well developed in many parts of Norway, but seeking to develop these more systematically at a small scale in small local environments with support from the county level, could provide in the future a certain impetus to explore new innovation delivery mechanisms.

The role of SMESTOs

There are 16 medium-sized cities (15 000 to 50 000 inhabitants) and 27 small towns (between 5 000 and 15 000 inhabitants) in Norway, representing 40% of the population. Twenty-three cities are located in target areas for regional aid and amongst these, 11 experience negative demographic developments. The attractiveness of these Small and Medium-Sized Towns (SMESTOs), in particular in terms of services and job openings, is crucial to retain young inhabitants and even attract incomers, for instance qualified immigrants. Innovation, usually comforted by the presence of institutions such as university colleges, can strongly contribute to this by developing new activities, thus instillating a spirit of confidence in the future of the area. Various policy measures targeting rural areas and their centres have been presented in Section 2.2.1 and further analysed above. Measures to comfort their public service delivery role are examined in the next section. This shows that these areas and primarily their rural hubs benefit from a wide spectrum of measures, in which innovation plays a major role. The SIVA network of

business gardens and incubators in particular is testimony to this, as are other measures in favour of rural areas (see Section 2.3.1).

New programmes are being launched in Norway to promote even more these small and medium-sized cities and towns as attractive living options. The programme for "Attractive and Environmentally Friendly Towns" (2000-2005) and now the programme "Beautiful Towns" (2006-2009), at the initiative of the Ministry of the Environment, are good examples of this. Besides the contribution of such national programmes, adding to the impact of certain sector policies such as transportation, regional initiatives can usefully be comforted, as they express a local understanding of the need for co-operation to strengthen the role of a hub in its area. In Nordland, the initiative comes from the county, aiming to develop the role of three cities that contribute directly to development of the whole region. The role of innovation needs to remain central in these different measures but in a networked fashion, as critical mass cannot always be easily attained in rural environments.

The economy of rural, remote and peripheral areas in most countries is highly dependent on the growth of small and medium-sized cities. These cities and towns act as service and business centres for their outlying areas and can be growth engines, in particular through innovation, for their small region. A healthy network of such small and medium-sized rural hubs is thus a major policy concern. The role of these medium and small-sized centres in rural development has been underlined by OECD in a publication released in 2006 (OECD, 2006e). Small and medium-sized cities are central players in the rural areas to counteract the polarisation of urban growth and maintain the settlement pattern (Nordregio, 2006). Their specific role is also recognised and supported in Ireland by the Irish Spatial Strategy (ISS) that seeks to foster more balanced territorial development patterns in the country. In Finland, the Regional Centre Policy (RCP) aims to sustain their growth by specific measures combining incentives for co-operation between municipalities in the area and support to economic development. In Luxembourg, Centres for Development and Attraction (Ministry of the Interior of Luxembourg, 2003), at different levels, aim in particular to better associate rural hubs to regional development processes.

2.3.4. Innovation policies for North Norway

North Norway features

The main features of North Norway have been presented in Section 1.4.1. It can be recalled that the three northernmost counties of Norway, Nordland, Troms and Finnmark cover one-third of Norway's mainland area for 10% of the population. Tromsø is, with 64 000 inhabitants in 2006, the largest municipality amongst 88. Compared to the rest of Norway the northernmost

parts include mostly sparsely populated, scattered settlements. Out-migration from the region is a dominant feature, with the exception of urban centres like Tromsø and Bodø. North Norway is heavily reliant on a natural resource-based sector and public sector transfers and services. There are more unemployed persons and receivers of disability benefits than in the rest of the country.

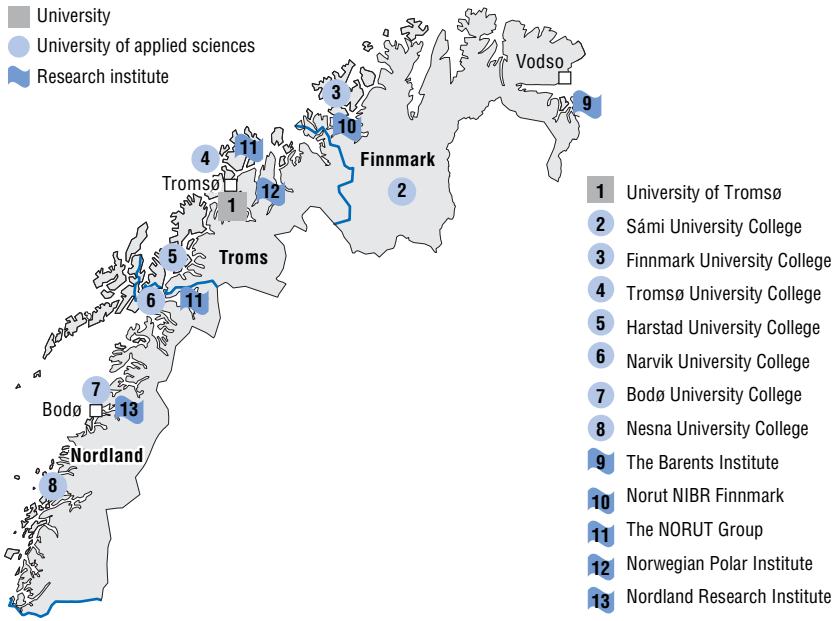
As the main industries are traditionally dependent on raw materials and that the share of very small firms is higher than elsewhere in the country, Innovation activity in the three counties of North Norway is comparatively low (see Section 1.2.4). Few enterprises pursue R&D and access to (risk) capital is also below national average. Empirical studies effectively show that North Norway scores low as compared to other regions on indicators used to measure innovation and R&D intensity. In particular, the amount of innovation and R&D activities performed inside firms is low as well as the number of man-labour years in the R&D sector.

The geographical situation of North Norway complicates access to global markets in terms of distance and costs. Railroads do not go further than Bodø. Shipping and air routes are the main links to the rest of the country. ICT infrastructure is rather well developed as in the rest of Norway but not all small communities are adequately served (see following section). These cumulative factors make it more difficult for most firms in North Norway to achieve critical mass and reach a wide customer base. In spite of climatic difficulties created by extreme latitudes and these inherent weaknesses, North Norway holds big promises with its wealth of petroleum resources from the Barents Sea and development of tourism. The growth of Tromsø, boasting the world's northernmost university, illustrates these perspectives.

Educational institutions and innovation dissemination

North Norway has a relatively good network of educational and R&D institutions which contributes to innovation developments (Figure 2.7). The central actor is the University of Tromsø, with the city playing a leading development role in North Norway as a provider of higher educational services for the whole of North Norway. The creation of the university in 1968[29] was a deliberate policy step, decided to train young people so as to retain them more easily in the area. Lines of study include medicine, pharmacy, psychology, law, social sciences, humanities, science and mathematics as well as fisheries. The creation of the faculty of medicine in particular aimed to solve the shortage of practitioners in that part of the country. The university has succeeded quite well in this respect as the majority of doctors studying in Tromsø now seem to stay in North Norway as indicated by different local actors.

Figure 2.7. **Educational institutions in North Norway**



Source: Ministry of Local Government and Regional Development.

There are approximately 10 000 students studying in Tromsø in 2006 (more than 6 600 in the university), with close to 70% coming from the region. Near to 10% of University enrolment concerns foreign students attracted by teaching standards equivalent to those in other parts of Norway and many Master programmes taught in English. The University engages in basic and applied research with a special commitment to inter-disciplinary research efforts focusing on the needs and problems of the North. Areas of specialisation include biomarine studies, biomedicine and biotechnology; health and welfare studies; indigenous studies (Sami language and identity), and northern/Arctic studies focusing on different disciplines (technology and science, social sciences). The latter link up with the Norwegian Polar Institute and the Polar Environmental Centre, both located in Tromsø.

The University Hospital has acquired national and international renown in the field of telemedicine. The Telemedicine Department, opened as early as 1993, was identified by the Ministry of Health as a national competence centre. What is now the Norwegian Centre for Telemedicine (NST) acquired in 2002 recognition from the World Health Organization (WHO) as its first telemedicine "Collaborating Centre". The centre, employing around 110 people, engages in R&D by gathering, producing and providing knowledge about telemedicine nationally and internationally and ensuring that e-health is

integrated into health service provision. NST produced at the beginning of 2007 a report on telemedicine in Norway (Breivik, Rye and Linstad) that is analysed in the following section of this review.

As a higher education institution, Tromsø University contributes to regional development by knowledge dissemination in the region and promotion of partnerships with the private sector. It set up in 1992 the Norut Group of which it is the main owner, jointly with the Ministry of Fisheries and Coastal Affairs to promote R&D and develop networking with firms and other educational and research institutions such as university colleges and technical institutes located in other parts of the region, for instance such as Bodø and Kirkenes.

The Norut Group has R&D activities in a total of five municipalities in North Norway (Norut Group, Ltd., 2006). The Norut Group Ltd. (Box 2.6) develops research activities relating to innovation policies and strategies, making recommendations to county and national governments. Norut Group activities cover a wide range of issues related to northern specific issues, like

Box 2.6. **The Norut Group**

Norut Group Ltd , founded in 1992, with activities in Alta, Tromsø, Narvik, Bergen and Stavanger has close to 300 employees. The subsidiaries are non profit research companies, except NorInnova, which is a general private limited company. The subsidiaries are the following:

- Fisheries;
- Norut IT;
- Norut NIBR Finnmark (Norwegian institute for urban and regional development);
- Norut Samfunn (Norut Social Science Research, Ltd.);
- Norut Technology;
- Norut Petroleum North.

Selected project profiles:

- Export-Oriented Business Development and Project Establishment;
- Arctic Strategic Impact Assessment, aiming to identify stakeholders, scope and themes of interest for oil companies in the Arctic;
- PhenoClim – Phenology as an indicator on climate change effects;
- Disciplinary integration in natural resource management (NRM) research;
- Energygrass: bioenergy in cold climate.

Source: The Norut Group Ltd (2006), *Annual Report 2005*.

exploitation of natural resources, climate change and provision of services in peripheral conditions. NORUT is, since 2003, the main owner of NorInnova, the only Knowledge Park in Norway where the university directly owns the facilities. NorInnova helps to commercialise business ideas by offering support in form of equity capital investments, seed capital, innovative environments and incubator activities. NorInnova has activities within the following areas:

- Innovation: IPRs, and development of business concepts based on research and new technologies.
- Equity capital investments at an early stage in new enterprises, supported by an active commitment in business development (seed capital fund of NOK 50 million).
- Innovative environments: innovative forums and sessions between R&D communities, entrepreneurs, companies and public authorities.

Innovation programmes in North Norway

NT

North Norway as a priority regional development area has its own innovation programme, "NT" (Innovation and new technology programme). This programme contributes to the creation of new technology companies while supporting technological development in others. Financial support and professional assistance are provided for the development of products and/or production methods, from conception to market launch. NT also contributes to competence enhancement and project management for qualified firms and can recruit researchers for a limited period. Eligible projects should be technologically advanced and have substantial market potential. The marine sector, ICTs, telemedicine and space and satellite technology are the main focus areas in the most recent programme period. NT is overseen by the Ministry of Local Government and Regional Development, with a budget allocation for 2007 of NOK 12 million. The programme instrument consist of funding capital (25% to 50% of investment, with a maximum of EUR 0.3 million/project), provided with strong focus on networking and project supervision by an NT adviser.

Evaluations have consistently given the programme much credit for its results and work-modes. It was first positively evaluated by the STEP Group at the beginning of 1996 (Isaksen, 1996), which led to its continuation. It was considered that the working methods and the approach chosen by the NT secretariat were well adapted to industrial conditions in North Norway. The programme identified and reached a relevant group of companies that were able to innovate and show positive results. It managed to follow up projects. Still according to the evaluation the programme's approach also made it possible to see the innovation process in a larger, integrated context, often

following the development of products and processes from the conceptual state through development and marketing.

The second evaluation of the NT-programme demonstrated that there is a continued need for this kind of programme (Norut samfunnsforskning and Ernst & Young, 2000). The level of R&D activity in companies in North Norway hasn't changed significantly since start of the programme but firms seem to be better prepared regarding competences, experience from project work, networking and ability to make use of relevant regional assistance. The main contribution of the programme was of a financial nature. The last evaluation concluded that the programme could be regarded as beneficial from a national viewpoint and that its additionality was high. Results show a success rate of 35%, probably due to strict focus on concrete and viable activities.

Arena

There are 3 Arena Cluster programmes in North Norway: a Tourism cluster, the Seafood cluster North, and SIREN (Space cluster). The Tourism cluster project, started 2006, aims to develop innovations and business within nature and culture-based tourism in Finnmark. The cluster is seeking to obtain "Norwegian Centres of Expertise" (NCE) status before 2008. The cluster project is structured as follows: analysis (develop knowledge to support business development), competence development (raise the level of expertise in the field of tourism business), meeting places (support networking), Innovation system (aiming to develop the innovation system for tourism in Finnmark), as well as *pilot projects* (create business-driven projects). The project is co-ordinated by Origo Nord AS, an innovation agency located in Alta and owned mainly by the city.

The Seafood cluster North started activity in 2001 and became an Arena programme project in 2003. The main goal of the cluster is to develop and strengthen the regional innovation system in Finnmark and North Norway to support sea related businesses. The main part of the activity is to network companies, R&D environments and other central players in the sector. The strategic approach for cluster work is to create value chains and support different parts of the value chain in their respective roles. Innovation is thus linked to biology, business, logistics, marketing and sales expertise.

SIREN is a nationwide space-related Industry Research and Education project. Targeted areas are business clusters within space and earth observation industries. The main focus is in North Norway and in the environments of Andøya, Narvik, Tromsø and Svalbard. The partnership includes all the relevant space related companies and institutions from the region, with Innovation Norway directly involved in the process. The cluster aims to stimulate better co-ordination between education, R&D and

businesses; contribute to the development of organisational models, market strategies and branding; promote the use of existing infrastructure and benchmark production competence.

Innovate North

"Innovate North", initiated in 2004, focuses on lifting barriers to innovation in the three northern counties. The hypothesis is that the particularly low innovation rate is explained by the business structure (mainly small and medium-sized companies with limited innovation capability) and by distance to markets and competence centres. Networks between businesses and between enterprises and R&D environments are also poorly developed. This situation offers scant job opportunities or career perspectives for young people, stressing the need for more competence based job alternatives, a major challenge for North Norway to be able to develop its economy in the future. Three projects with significant public support (EUR 350 000) have thus been defined. These meet new criteria stressing commercial potential and the need for long-term and complex development involving research institutions. It is also required that at least 3 companies working together with complementary competencies and a more diversified one co-operate in the value chain. The learning created in the process is part of the final deliverables scheduled in 2007.

Tromsø as an innovation engine in North Norway

The major challenge facing Tromsø is how to effectively leverage for the whole of North Norway and the private sector the reservoir of talent and creativity located in the university and the many specialised institutions situated in the wider area. The inherent handicap of distance and low population density cannot be ignored, making it difficult to forge a truly common identity, although Tromsø is geographically at the centre of the three counties. Bodø and surrounding areas retain their mining and industrial features, Tromsø is now more of a knowledge centre and Kirkenes is focused on the tremendous gas and oil reserves of the Barents Sea, with big projects such as exploitation of the Snowhite field and related LNG terminal (see Chapter 1). Of course, there are strong common features such as climate conditions and a well spread activity like fishing. How can different characteristics be overridden and shared traits be exploited so as to foster a stronger spirit of co-operation?

Strong networking is obviously the main answer, along the model developed by the university itself with the university colleges and the other learning and research institutions situated in North Norway. Networking necessarily leads to partnerships that should be systematically encouraged. The whole region benefits from specific attention by national authorities, whether through various fiscal and grant schemes based on objective

demographic characteristics or through special programmes devised uniquely for North Norway. These resources could be more efficiently used if different programmes were geared not only towards measurable project results but also towards working methods and processes leading to long-term co-operation. If Tromsø, as the leading city in North Norway, is to unleash its growth potential for the whole region, it needs to follow jointly two paths. One is stronger co-operation within North Norway, the other is increased internationalisation.

The Executive Committee for North Norway[30] (ECNN) which also includes North Trondelag could be a possible framework for developing co-operation. However, besides the fact that it is spread over a wider area, it is mostly a useful forum for exchange of information facilitating synergies between sectors in the wide area more than a body directly driving projects. In the latter case, a growth pole approach is required, with the main city assuming a certain degree of leadership and this being recognised by its partners, in the common interest of North Norway. The other angle, pursuing the same goal, would be regional reform, if the future map of counties would retain a single region comprising the present three counties of Nordland, Troms and Finnmark. Of course, such a perspective is not easily opened but without such an ambition, whatever option is chosen, it appears difficult to improve the efficiency of present policy delivery, aiming to retain population in the area.

The example of Oulu in northern Finland could be pondered from that point of view. The City of Oulu is a successful growth engine for that part of the country and, alongside national regional policy measures, has been taking initiatives of its own to foster economic growth across the whole of Northern Ostrobothnia that stretches from the Gulf of Bothnia to the Russian border, recognising in particular that closer firm linkages benefit the whole region. Helping to maintain activities in more peripheral regions can promote supplier chain approaches for firms located in the regional capital. The collaboration with other centres, called "1+3", links Oulu and smaller centres since 2001 within a network which works towards the same goals in promotion of regional development (Box 2.7).

Tromsø is already engaged in many activities resulting from leverage of its assets such as polar research or use of local difficulties (low density, distance) to devise adequate responses (telemedicine). In these fields, Norway has acquired international excellence and co-operation with institutions or firms in other countries in these areas is growing. In particular, the northern dimension, enlarged to Finland, Sweden and Russia is developing through different agreements such as Interreg and Interreg Barents. Another interesting initiative is Multipolis (OECD, 2005e), launched in the year 2000 that brings together knowledge centres and firms in these countries with a focus on high technology, in the areas of telecommunications, wellness and cold climate conditions. Pursuing such types of co-operation with reference to an overall

Box 2.7. **Council of Oulu Region's 1+3 regional centre network**

This network of four different profile centres in Northern Finland comprises the following areas:

Oulu: the regional capital (population of 130 000, Greater Oulu, 175 000), with a strong ICT base (Nokia in particular); **North-East** (population 30 000): Tourism, ICTs; **Raahe** (population 35 000): Steel; **Oulu South** (90 000 inhabitants): hi tech wood and mechanical products; ICTs. The role of the network is to facilitate exchange of information between the municipalities so as to better comfort positive trends and develop strategies to counter negative ones:

- Inward migration issues;
- Identification of development possibilities within each centre;
- Fostering of joint projects;
- Development of focus areas in separate centres;
- International aims through joint promotion.

Source: Council of Oulu Region (2006), Regional Development Programme, 2007-2010.

strategy for internationalisation rather than on a case by case basis would bring added value and facilitate attracting potential international investors. Specific promotion of the whole area in the international arena could be another step, with set-up of a kind of an Information Bureau for North Norway with presence abroad, perhaps under the umbrella of Innovation Norway.

Bringing together these different policy perspectives would require a vision for all of North Norway including the insular parts such as Svalbard. The whole region is facing major challenges bringing new opportunities in the fields of climate change, tourism and the environment. Potential conflict can arise between different concerns such as exploitation of mineral resources, fishing, tourism and protection of eco-systems. To overcome these potential contradictions while fostering balanced territorial development within the whole region, greater co-operation between the major urban centres of North Norway and increased internationalisation need to be linked to a strategy that local actors could define jointly with national authorities.

2.3.5. Summing up

Policy framework and tools

As seen in Chapter 1, Norway appears rather innovative, with high levels of productivity in many sectors. Policy pursues promotion of innovation across all regions, with, in many cases, a deliberate bias towards district assisted areas and North Norway in particular, where the growth of Tromsø is

testimony to the success of well targeted policy measures. The broad picture is thus positive. However, the system appears rather complex with multiple actors and programmes sometimes overlapping and in spite of efforts, innovation still remains difficult to apply in traditional environments. Can the policy scenery be simplified, making more room for programmes inspired by the principles of the promising Norwegian Centres of Expertise based on competitive calls for tender?

Urban innovation

The lack of a comprehensive urban policy in Norway up to now, although certain traits of urban policies can be found in different policy tools, has not permitted to clearly bring forward the links between urban development and regional competitiveness. Can Oslo and other major cities better contribute to regional development by continuing to build strong innovation based clusters without increasing present territorial imbalances due in particular to inward urban migration? Can stronger networking between these cities and with the North as well as with medium-sized cities in different parts of the country provide part of the answer? Once again, regional reform but also delivery of the first-ever White Paper devoted to the capital city area, as well as an impending White Paper on innovation can bring these important issues into proper focus, by seeking to conciliate global challenges and regional development concerns.

Remote and rural areas

An important knowledge infrastructure is deployed by Norway in rural and even remote areas but lack of training and human resources in SMEs is often an obstacle to full use of these capacities. What kind of policy measures could help to better leverage the knowledge infrastructure in areas with mostly traditional activities that are losing population? Are there ways of better consolidating the role of small and medium-sized cities to this end? It seems that development of support measures but also incentives to foster intermunicipal co-operation in the area of innovation activities could contribute towards solving the problem of critical mass and economies of scale. The best example relates to ICT projects by common use of infrastructure and services (see next section).

North Norway

North Norway holds great promises with its wealth of natural resources, the only question being how to effectively leverage these for the benefit of the regional economy. Achieving this also means attracting new inhabitants to an area that continues losing population, even if Tromsø and Bodø are growing. Can better exploitation of North Norway opportunities be sought by closer co-

operation between the three counties and the three leading urban areas in North Norway? Can stronger "knowledge spillovers" towards the rest of the area occur from Tromsø? How could the exceptional tourism amenities and polar research be better promoted?

2.4. Service delivery in areas with population decline

2.4.1. Policy challenges

Norwegian policy is committed "to give people a real choice about where they want to live" and that "everybody in every part of the country has the opportunity to develop their abilities and ensure quality of life. The good life can be achieved in rural as well as in urban communities. The government places prime importance on fostering equal opportunities across the country and sustaining in large measure the present settlement pattern." (Ministry of Local Government and Regional Development, 2006b). The implications of this statement relate to economic growth and to service delivery as basic components of living standards. The aim is to make small towns attractive to young families, to foster employment opportunities and adequate public services, to provide culture and leisure activities as well as a socially attractive environment.

Achieving equivalent public service delivery for all regardless of place of residence implies that areas of population decline, most of which are rural and/or remote and sparsely populated, will provide services to the citizens of these areas at a higher unit cost than that of more populated areas for equivalent standards. Two hundred and twenty-eight Norwegian municipalities out of 431 have experienced negative population growth between 1997 and 2006 according to Statistics Norway. The negative growth ranges from the municipality of Odda (2006: 7 247 inhabitants) in the county of Hordaland, with a net decrease of 714 inhabitants in the period to a decrease of five inhabitants in that of Alvdal (2006: 2 392 inhabitants) in the county of Hedmark. A systematic comparison of service dimensions in several groups of municipalities will show how the endeavour of implementing equal standards has been met in Norway. The groups are the following: all municipalities together (including Oslo as for most of the issues under consideration results without Oslo did not change outcomes significantly), municipalities that have had an overall negative or positive population growth between 1997 and 2006, and the 30 municipalities with highest negative or positive population growth in the same period.

Municipalities and counties are important providers of education, health and social services on the basis of national standards defined by law. Standards refer mostly to quantitative input ratios or resources related to population (number of physicians per 10 000 inhabitants, number of pupils

per class) than to measurable output standards (health condition of the population) or perceived quality standards (satisfaction with the level of service). Funds for local welfare services are largely provided by block grants (unconditional) and to a lesser degree by earmarked grants. The equalisation system (see Chapter 3) normally covers additional unit costs or lack of fiscal resources due to a narrow tax base. Municipalities with population in decline are nonetheless in tight financial situations as there are still some loopholes in the system, in particular threshold effects[31] that are not entirely compensated.

The organisation of service delivery is largely left to the initiative of municipalities that have to manage their available own and transferred financial resources with efficiency. As a part of this freedom of organising delivery within the scope of national standards compliance, municipalities decide in which proportions to allocate spending in education or social services, although national standards can require expenditure from local authorities in a specific item that is not necessarily a local priority. Municipalities have to deal with "competing" local priorities, such as education or care of the elderly depending on their resources and the special needs arising from the population structure and national standards decided by sector agencies or departments.

Furthermore, the public sector can no longer provide services that an ever demanding population requires in sparsely populated areas uniquely with traditional means. Classical ways of locating offices and service points where citizens live are no longer sustainable. Services profit from the opportunities offered by ICT and this has been an overall and sector response to the problems of service delivery in less populated areas. However, ICTs provide technological solutions that have to be adapted by organisations. Political and administrative systems are organised as "silos" in which little concern for cross-sectoral issues is shared by ministerial departments or local service units. ICT solutions require more "join-up" government and less do-it-yourself strategies. Join-up government is not only relevant for central level agencies and ministries but also for the interwoven network of local-central relations in service delivery.

Conciliation of national welfare standards with the recognised autonomy of local authorities to adapt national solutions to local needs and demands proves not to be easy. In Norway, certain scholars (Fimreite and Lægreid, 2005) witness a centralisation of central-local government relations through standardisation, legislation and conditional financing of the welfare state. Mistrust in local government seems to underline this centralisation process, but without devising join-up strategies with local authorities, the welfare system faces serious challenges. Examination of policy documents and evaluator reports on the different issues to be explored in this section tend to

demonstrate that some of the inter organisational problems are recognised and worked upon, while others still need more impetus.

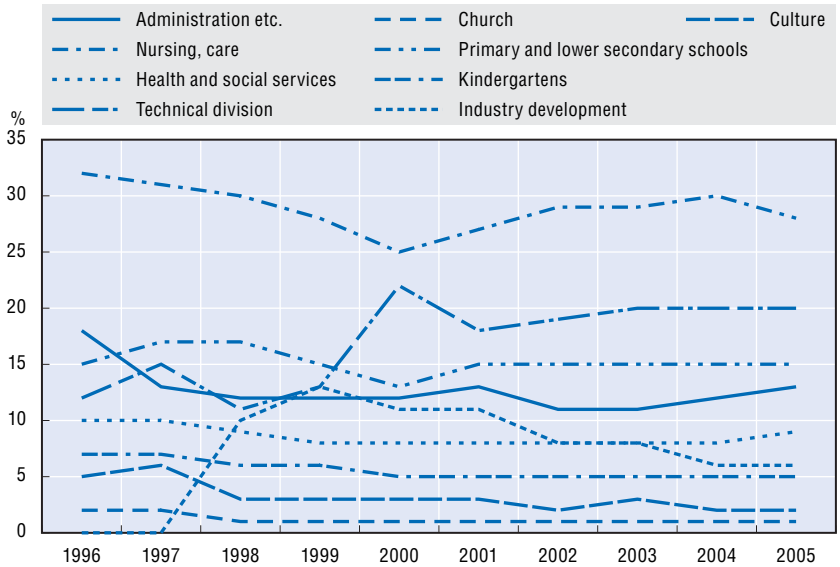
The explicit or sometimes implicit policy response to the challenges posed by the delivery of services in sparsely populated areas can be understood as a combination of two distinct theoretical frameworks that have been analysed by a Norwegian author (Aasbrenn, 2006). The first framework, with reference to central place theory, focuses on "threshold" (minimum sales for an enterprise to survive) and "range" (maximum distance from which an enterprise attracts customers). In order to overcome the problem of distance to the point where services are delivered one should combine the decentralisation of services according to the subsidiarity principle and reduce geographical distances whenever possible. This theory is based on the direct relationship between public authorities and the individuals and founded on the sole responsibility of public authorities to deliver services. The second framework goes beyond the issue of distance and public authorities as single providers. It includes all actors involved in service interactions (public, private, individuals and voluntary organisations). This approach implies that consumers are also proactive and thus become "prosumers" that "co-produce" services.

In many countries, the public sector is precisely relying more and more on civil society for delivering services in rural areas. This is particularly the case in the United Kingdom (Defra, 2005). Voluntary organisations, neighbours and the users themselves will probably have to be proactive if they want to continue living where they want to. In this case join-up strategies and encouraging voluntary work will be some of the tasks of the future in countries like Norway where specific constraints require innovative approaches, whether in education or in health and care services in areas of declining population that are dealt with in this section.

2.4.2. Policy responses

Municipalities provide a wide variety of services, with more than half of the budget on average devoted to welfare services (nursing care, health and social care, education for kindergarten, primary and lower secondary schools) in municipalities with negative population growth. Figure 2.8 presents the case of the municipality of Rendalen in Hedmark. The municipality of Steigen (Nordland), also visited by the OECD, shows a comparable evolution. Both are considered to be typical of Norwegian municipalities experiencing population loss. Due to ageing trends, welfare expenses tend to be on the rise in the most recent period (since the year 2000) whereas schooling expenses tend to stay level or decrease in proportion.

Figure 2.8. **Municipal expenditures by category in per cent of total in Rendalen (Hedmark)**



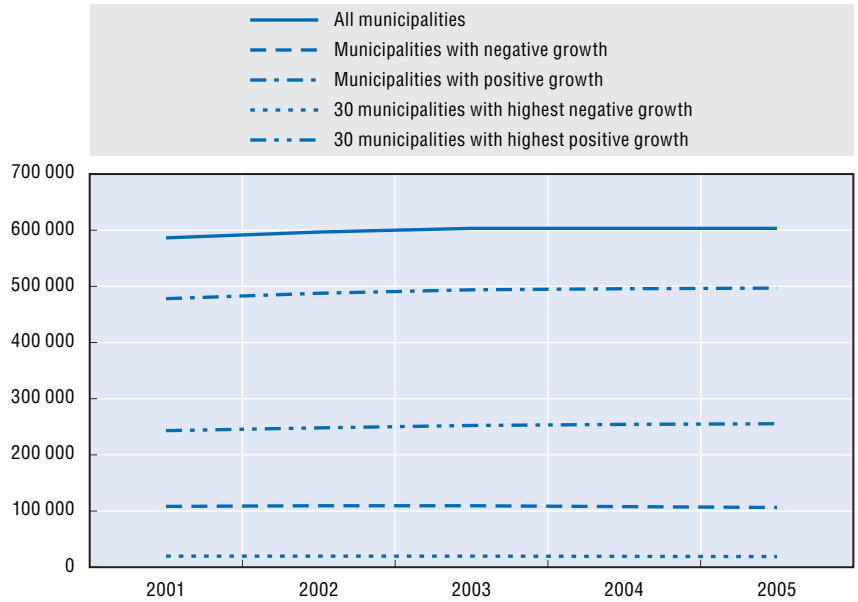
Source: Information provided by the municipality of Rendalen.

2.4.3. Education

Counties are responsible for upper secondary education, vocational training, and adult education. Municipalities are in charge of kindergartens, primary schools and lower secondary education; they oversee private day care institutions and kindergartens. Schools in Norway are often quite small. In 2004, 36% of primary and lower secondary schools, containing 9% of the pupil population, had less than 100 pupils (OECD, 2004b). These figures highlight the issues facing the school system in remote rural areas: containing costs per head while delivering quality schooling to all with a proportionately reduced teaching staff. Main problems result from the declining number of pupils, especially in the most sparsely populated areas, the closure of schools, ever growing distances and need of school transportation. Reduction in state transfers due to a dwindling number of pupils leaves open the issue of fixed costs.

In 2005, municipalities owned 2 990 primary and lower secondary schools with 603 306 pupils (see Figure 2.9). The number of pupils stabilised around 603 000 between 2003 and 2005. The decrease is particularly noticeable especially in municipalities with negative population growth while municipalities growing in demographic terms have witnessed a correlative increase in their number of pupils during the period under consideration.

Figure 2.9. **Number of pupils in primary and lower secondary schools (2001-2005) in Norway**

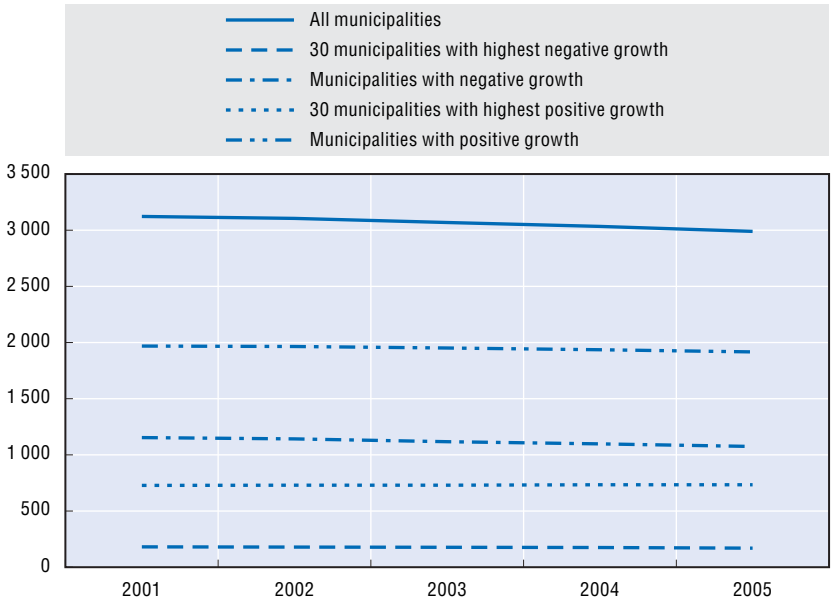


Source: Statistics Norway.

A continued decrease of the number of pupils would entail an increase of closures and mergers of primary and lower secondary schools in less populated areas. The municipality decides on public school closures, particularly since there are no legal minimal requirements to keep a school open. With decreasing numbers of pupils, more school closures are expected. Data available (see Figure 2.10) shows that the primary and lower secondary public school decrease was of 133 in the whole country between 2001 and 2005. The downward trend has been experienced in both municipalities with negative and with positive population growth. However, the municipalities with population in decline (also the least populated) account for 60% in the decrease of the number of schools. The only positive trend can be seen in the 30 municipalities with the highest positive demographic growth since 1997.

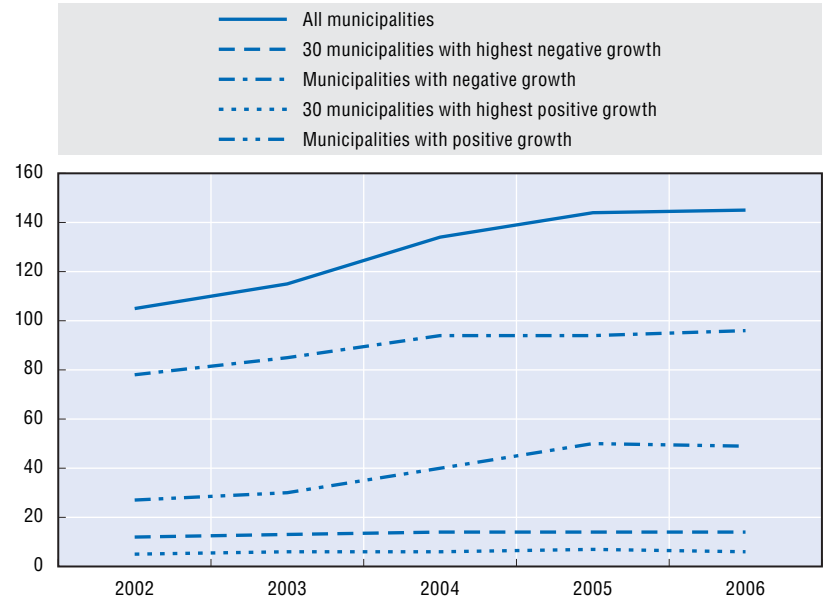
A possible answer to public school closures is the establishment of private schools by parents, allowed in Norway, although in June 2006 Storting decided a pause while waiting for a new law. Some limited exceptions were accepted, mainly concerning the establishment of rural schools. The draft proposal grants private schools the right to state contributions with the minimum requirement of 15 pupils at each private school. The number of new private schools has been growing (see Figure 2.11) in the last five years (except for 2006 as a result of the pause decided by Storting). Although the absolute number of private schools is

Figure 2.10. **Number of primary and lower secondary public schools (2001-2005) in Norway**



Source: Statistics Norway.

Figure 2.11. **Number of primary, lower secondary private schools (2002-2006)**



Source: Statistics Norway.

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higher in municipalities with population decline, higher growth of new private schools has occurred mostly in those areas with positive population growth. Conversely, there is no significant increase of private schools in the 30 municipalities with the highest negative demographic growth. In the school year 2004-2005, 55 primary and lower secondary schools and 10 special schools were closed. 18 of the closures were related to an organisational change, like a merge with a lower secondary school to form one unit (grade 1-10). In the same period 15 new schools were established, of which 10 were private schools.

The closure and merger of schools has a direct impact on transportation. It is difficult to ascertain any trend of higher use of public transportation in the same period in which schools have closed down. However, Table 2.7 shows great differences regarding the percentage of pupils entitled to public transportation. When all municipalities are considered, 22.6% of pupils use public transportation. In areas of population decline, 42.1% of pupils are entitled to public transportation while in the 30 municipalities with highest positive population growth only 9.2% use public transportation. Public transportation paid out of school budgets is costly judging from figures concerning Rendalen primary and lower secondary schools where around NOK 1 million went to pay public transportation costs in 2005.

Table 2.7. **Percentage of pupils entitled to public transport in 2005 by municipality type**

	Total pupils	Percentage of pupils entitled to public transport
All municipalities	602 604	22.6
Municipalities with negative population growth	438 069	42.1
Municipalities with positive population growth	164 535	18.2
30 municipalities with highest negative growth	80 173	37.1
30 municipalities with highest positive growth	15 647	9.2

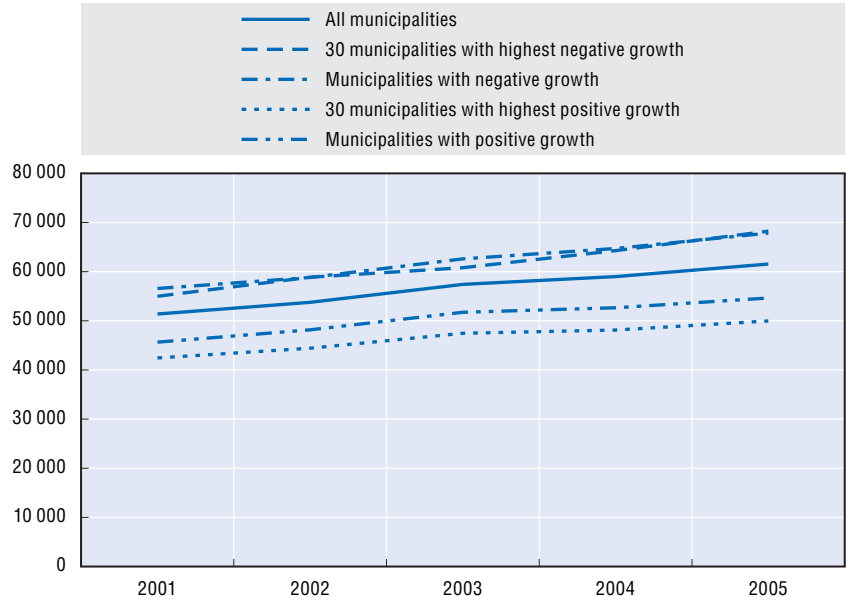
Source: Statistics Norway.

Norway funds its education system at a generous level (OECD, 2004b). Its overall expenditure on primary schools per pupil is nearly 50% more than the OECD average and second only to Denmark. The expenditure patterns change considerably between areas with positive population growth and municipalities with population decline. The average expenditure per pupil in municipalities with positive population growth is below the general average and considerably higher for municipalities with population decline. Expenditures per pupil are increasing in those areas in which the number of pupils is diminishing.

Norway also has low ratios (11 pupils per teacher average) between the number of pupils and the number of teachers in primary and lower secondary

Figure 2.12. **Average wage expenditure per pupil in primary and secondary schools**

NOK: 1 000



Source: Statistics Norway.

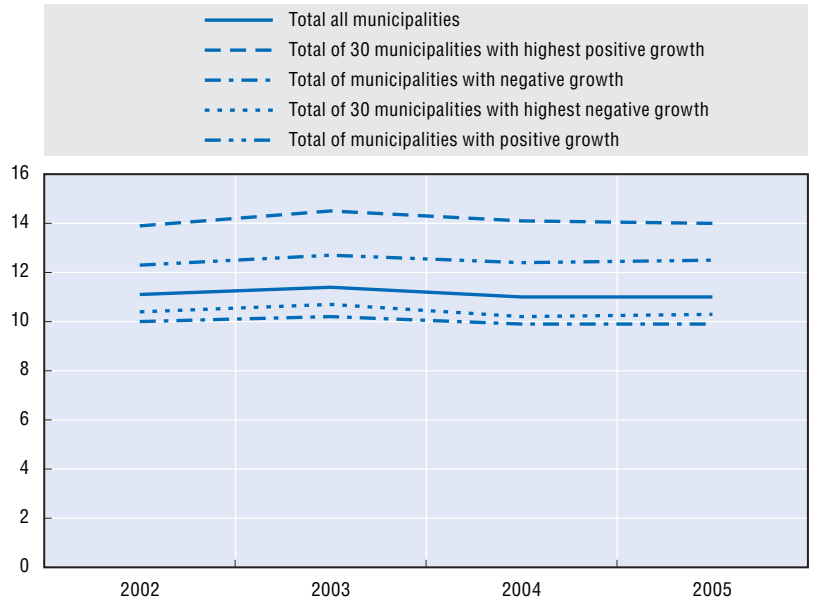
education. Only Denmark has a lower ratio in its primary phase. Norwegian ratios are considerably more generous than OECD averages. As expected, the ratio of pupils to teacher averaged 14 among the 30 municipalities with the highest positive growth, while municipalities with population decline had even a more generous ratio with 9.9 per teacher, which has direct implication in higher costs for these municipalities, as fixed costs are maintained. In spite of these ratios, there still is a lack of certain teaching skills in rural areas, justifying a pooling of teaching resources between schools thanks to the introduction of ICTs permitting distance learning from an extended classroom (see further). Future plans in the field of education relate to planning an increase in the density of teachers in rural areas and to improvement in the capacity of education for teachers. Since 2005 the minimum training requirements were sharpened in an effort to increase recruitment in the long run.

The above-mentioned OECD (2004) report states that Norway has an expensive education system albeit with mixed results in terms of achievements (see Chapter 1). Norwegian 15-year-old pupils perform only at an average OECD level in international tests while assessments of adults of varying ages however show the high quality education of the Norwegian working population, with no striking differences between rural and urban areas. This is certainly the result of

the Ministry of Education focus on homogenising educational standards from a social, ethnical and geographical perspective. In the past, the implications of equity policies on education levels were difficult to assess because the minimum standards applied by central government throughout the country are more related to the number of teachers, investment and the like per pupil. The focus was rather on inputs than on outputs and outcomes.

An Internet initiative (*Skoleporten.no*) of 2004 seems to lay the grounds for comparing other performance indicators related to the results of education. The avowed purpose of this portal website is to present data regarding resources and test results (for instance, reading, writing, English and mathematics), accessible to administrators, teachers and parents. The web- site contains more than 300 indicators, some of which are qualitative. *Skoleporten.no*, as a benchmarking instrument aims to provide comparisons between schools that could help to increase education quality in those institutions that are lagging behind. This could introduce some amount of competitive tension between schools that can be useful to upgrade overall quality in urban areas. However, this will be difficult for sparsely populated areas in which there is little or no competition, as choice is not possible when schools are closing or merging and distance is the limit.

Figure 2.13. **Pupils per teacher with required qualification**



Source: Statistics Norway.

Health

In Norway, following the principles of the Nordic welfare state, the public health system is designed to deliver high quality health services to all citizens, regardless of socio-economic conditions, age, sex, origin or place of residence. This universal system, however, encounters certain geographic variations in distribution, accessibility and quality due in particular to distance, topography and low population density in certain areas. Upholding the principles of equal access to quality health services in all parts of the country, requires permanent concern for cost-efficiency goals, availability of skilled personnel and monitoring of trends in this sector so that the government may be able to oversee the smooth functioning of the overall health and care services framework.

This broad framework is defined by its legal quantitative and qualitative standards, that are monitored by the central government (National Health Board) and by its sharing of responsibilities in the health sector across levels of government. The 2001 hospital reform (see Chapter 3) has given responsibility to the central government for main hospitals, now operated by regional health enterprises, while municipalities remain in charge of primary and elderly care and are funded to that end by the central government through the block grant system, allowing for equalisation in cases of additional costs or reduced tax bases, as detailed in the next chapter. Such a division of tasks requires adequate and permanent co-ordination, as recognised by the National Health Plan (2007-2010) that addresses a certain number of other challenges.

In such a context, overriding geographical or social inequalities in health in a public health system with universal, full coverage for most services, one of the main issues is to ensure that the right amount of resources are allocated to the most serious and frequent health problems, and that health personnel be equipped with the right knowledge, methods and incentives to prioritise right when delivering health services. From this point of view, a major challenge is the increased incidence of lifestyle-related diseases and the fast introduction in the market of new and often costly medical technology and pharmaceuticals. Strong growth in the number of users with varying degrees in incapacity and a greater range of health and social problems require different professional skills and a complete life-cycle perspective on the long-term care services.

Growing needs as a result of an increase in the number of elderly will gradually require expanding the capacity and improving the expertise in ageing, with special focus on dementia and complex illnesses. The scope of the challenges must, however, be viewed in light of the fact that the new elderly generation is in better health and has more resources in the form of higher education and better finances to cope with old age. On the other hand as a result of the ageing of society, there are no major increases in the supply of

manpower and potential voluntary care providers. Stable family care entails the public sector meeting the entire expected growth in needs, and requires a locally-established long-term care service in close collaboration with families, volunteers and the local community.

Co-ordination of care and health services between the different service providers, and between the primary and specialised health services, is central to the efficiency of the system in terms of meeting citizen's expectations but also of controlling overall costs. Service recipients with chronic diseases, dementia, mental health problems and other persons in need of a permanent, multi-services approach are very vulnerable to lack of co-ordination. A need to improve the medical and multidisciplinary follow-up of the home care service recipients and residents of nursing homes and community care housing has been identified by health authorities and efforts are made to that end.

The recruitment, education and distribution of health care personnel to meet evolving healthcare needs is a major challenge, mostly felt by small municipalities and local hospitals or health centres they operate. In Norway, the hospital structure encompasses many small, local hospitals, to ensure easy access to many "basic" hospital services (general health services) whenever recourse to the regional hospital is not required, at least in a first stage. It is a stated government policy that none of these local hospitals are to be closed down. This requires establishing a robust and clear division of labour between local and regional or university hospitals, the latter dispensing services demanding a higher volume or degree of specialisation. This policy entails both centralisation of some types of hospital services and decentralisation of other types of services, with division of tasks between hospitals openly debated, both locally and in Parliament.

On a general level, it is recognised that the Norwegian health system is organised to deliver services of high quality and many indicators are testimony to this: infant mortality rates, in particular, are among the world's lowest. Nevertheless, in a system with shared responsibilities there are great challenges in assuring high quality and the use of knowledge-based medicine everywhere. This is particularly the case in areas of declining population where recruitment of qualified medical personnel is sometimes difficult and where the distance factor requires more than elsewhere, efficient co-ordination. The Ministry of Health and Care Services recently launched a national strategy for quality development of health and social services focusing on means and instruments to enhance quality and exchange experiences between local health and social service providers. Although the focus is nationwide, the specific constraints that prevail within areas facing population loss will, analysed below, will necessarily be considered.

In his recent review of the history of Norwegian health policy during the last 100 years, Ole Berg maintains (Carlsen, 2006) that there has been a shift in the national health policy from distributive justice to efficiency and cost containment. This drive towards efficiency is part of the more general movement of New Public Management, in which performance acquires an enhanced status. Health is one of the sectors world wide in which costs grow at a roaring pace. Specific to Norway and other Nordic countries is the additional cost increase due to the stated goal of delivering an equal level of health care to the population regardless of place of residence. Primary health is more costly in remote areas because of low patient to practitioner ratios, proportionately higher salaries aiming to attract skilled personnel and higher costs of specialist care, due to distances in particular.

One of the challenges identified for the health care sector in the *OECD Economic Survey of Norway* in 1998, "balancing the need for cost-effectiveness and the ambition of maintaining comprehensive health care services countrywide" still remained in 2006, according to the latest *Survey*. Furthermore, despite higher levels of expenditure, territorial variability in how services are delivered in terms of quantity and quality still remain and causes concern among authorities. The 1999 Act on Patient Rights and the 2001 Act on Health Enterprises restated the equity principles in the health care sector as a part of government policy. This means that individuals should be treated equally regardless of social, demographic and territorial conditions. The situation in sparsely populated areas and areas with population decline is a challenge to maintain this equity principle.

General practitioners

From 2001, the general medical services have been organised as a Regular General Practitioner (RGP) scheme. General Practitioners (GPs) are a key part of the municipal health services. There were 4219 man-year physicians engaged in municipal health activities in 2005 according to Statistics Norway. Most of these (76%) are self-employed, 13% of GPs are municipal employees on a fixed salary, 9% are newly qualified doctors serving their compulsory practice period[32] and 2% work without a contract. The Regular General Practitioner (RGP) is responsible for the general medical services and information for the persons on the list, as well as referral to health institutions when required. The RGP is further responsible for planning and co-ordinating preventive work, examination and treatment of patients and their follow-up, in particular after discharge from a health institution.

As a co-ordinator the RGP acts as a gatekeeper: granting and denying access to specialist services for patients according to assessment. Besides, a more restrictive referral system was recently introduced. A referral is now

mandatory for the specialist to claim reimbursement from the National Insurance Scheme. The restriction of the referral system is expected to have positive effects in terms of cost control. Results from the evaluation of the regular general practitioner scheme indicate that RGPs are less restrictive as gatekeepers than before the scheme was introduced in June 2001. A qualitative study indicates that RGPs experience more competition among each others, more demanding patients and more responsibility for own patients/listed persons, and therefore provide more services like referrals to specialist health services, reimbursable prescriptions and sick leaves (Carlsen and Norheim, 2003, in Research Council of Norway, 2005).

To some extent, each GP's salary is determined by the size of the list. The regular general practitioner reform (the list system) aimed to improve GP access for patients, to strengthen the relationship between patients and doctors (make for better continuity in doctor-patient relationships) and to attain a better utilisation of the total medical resources by improving the collaboration between levels of services, among others. Patients may choose a GP as far as there is capacity on the wanted list. The RGP and the local authority may agree upon a minimum of 500 and a maximum of 2 500 inhabitants on the list; these are entitled to get an appointment within a reasonable time frame. The lists are currently kept by the Norwegian Labour and Welfare Organisation (the former National Insurance Administration). Inhabitants are allowed to change RGP a maximum of twice a year.

The list plays an important role in GP salaries. The salary is compounded of three parts: one-third consists of capitation-based (directly related to the number of people on the list) reimbursement paid by the contracting municipality, which receives the money from central government through block grants. The other two-thirds are shared by a small fee paid by the patients and the activity-based reimbursements from the National Insurance Scheme. This capitation element replaced the previous basic allowance, the size of which depended upon the number of auxiliary personnel. Small municipalities with less than 5 000 inhabitants can provide an additional capitation fee (a levelling grant) to compensate for short patient lists. In some cases, municipalities pay GPs fixed-wages higher than stated in regular tariffs in order to offer competitive recruitment conditions. This strategy does not always prove to be successful. The municipality of Rendalen (Hedmark) is having considerable difficulty in finding a doctor willing to earn NOK 1 million a year plus additional benefits.

Rise in health care expenditure is also due to other factors. According to the 2005 *OECD Economic Survey of Norway*, healthcare expenditure as a portion of GDP was basically stable until the end of the 1990s. After that, it started to grow at one percentage point higher than the OECD average in some years. Per capita expenditure, the third highest in OECD countries, is more than 50% above the

OECD average. There are many factors explaining this, not only territorial dispersion of population. Among them, the following can be cited: increase in number of nurses, pharmaceutical expenditure, specialist referrals and long-term care beds. The share of municipal expenditure for general medical services (including public general medical work and out of hours services) per inhabitant increased from 66% in 1999 to 83% in 2002 (see Table 2.8) in municipalities smaller than 2 000 inhabitants. The smaller the municipality, the higher the cost per inhabitant. Also, special financial arrangements apply in the Action Zone of Finmark and North Troms (reduction of student loans, up to 10% of the initial loan, maximum NOK 25 000 a year, for doctors working in the area).

Table 2.8. **Municipal share of total public expenditure for general medical services**

	1999	2002
Less than 1999 inhabitants	66.0	83.0
2 000-4 999 inhabitants	64.0	72.0
5 000-9 999 inhabitants	58.0	61.0
10 000-19 999 inhabitants	57.0	56.0
20 000-29 999 inhabitants	55.0	51.0
30 000-49 999 inhabitants	55.0	51.0
More than 50 000 inhabitants	49.0	50.0
All	58.0	56.0
Coefficient of variation	0.10	0.21

Source: Statistics Norway, Primary physician service, municipal expenses, 2002, quoted in OECD 2006.

The number and distribution of medical posts between the primary and specialist health services in Norway is controlled by the Ministry of Health and Care Services. Several authors (Askildsen, *et al.*, 2002 and Baltagi, *et al.*, 2003) have analysed the reasons of the shortages of nurses and GPs since the beginning of this century. The problem of recruitment is more acute in remote areas. The number of GPs per inhabitant in sparsely populated areas has to be higher than in more densely populated areas to provide sufficient out-of-hours services. (Table 2.9). There were 13.5 physicians per 10 000 inhabitants in 2005 in areas with population decline whereas 9.3 per 10 000 residents in municipalities with positive growth. For physicians, the issue of isolation and earnings might account for recruitment difficulties. The number of physicians remained steady during the period 2002-2005 (see Figure 2.14).

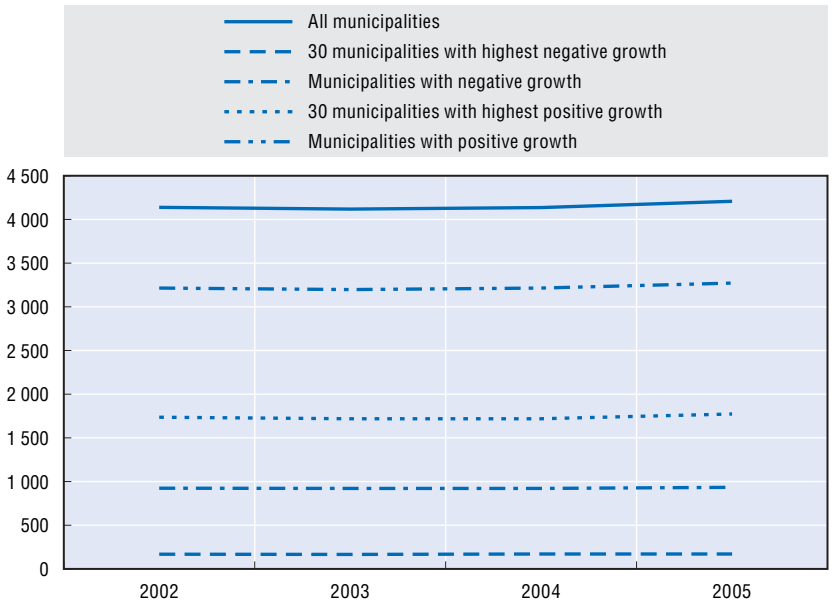
Another concern raised by geographical variability is related to physicians' skills. According to the 2005 *OECD Economic Survey of Norway*, authorities are concerned that physicians in remote areas do not seem to sufficiently benefit from transfer of knowledge by being in continuous interaction with other physicians as it is the case in hospitals or in more populated areas. Individual

Table 2.9. **Average number of physicians per 10 000 inhabitants in 2005**

All municipalities	11.6
Municipalities with negative population growth	13.5
Municipalities with positive population growth	9.3
30 municipalities with highest negative population growth	13.1
30 municipalities with highest positive population growth	8.4

Source: Statistics Norway.

Figure 2.14. **Evolution of the number of physicians (all types) 2002-2005**



Source: Statistics Norway.

updating skills do not compensate for the lack of the "spillover" effect achieved where clusters of doctors are present. Apart from the initiative of the National Centre for Health Service Research of disseminating best practices, one may wonder whether a combination of e-learning and exchange of information between rural physicians would help to overcome this variability to some extent.

Hospitals

The Health Enterprise Act transferred hospital ownership from counties to central government in January 2002. Hospitals are operated as health enterprises that report to five (now four) geographically based "Regional Health Enterprises". The 81 hospitals merged into 33 health trusts, separate legal

entities from central government. As stated in the bill put forward to Parliament the reform is based on targets seeking to:

- Increase treatment capacity and reduce waiting time for medical examination and treatment;
- Ensure that patients are given priority in keeping with established national guidelines;
- Provide effective specialist health services regardless of where they live;
- Ensure that hospitals are able to perform their research and teaching tasks satisfactorily;
- Enhance co-operation between specialist health care services and municipal health/care services.

It is difficult to evaluate cost containment. However, achieving this objective has been complicated by the fact that generalised wage increases have been witnessed over a two-year period since inception of the reform. The research programme established to evaluate the Hospital Reform of 2002 documents that the rate of activity has increased more than previously, which implies that access is probably better overall. There have been only small changes in the degree of centralisation or decentralisation of the services offered. This also applies to services where this would have been desirable for quality reasons (centralisation) or for reasons of access (decentralisation). Overall, there seem to have been few changes of substance in the distribution of functions between hospitals (Norwegian Research Council, 2005b).

On the other hand co-operation among different levels of the health sector seems to have increased since the hospital reform that might have encouraged new approaches to maintain quality health services in spite of budgetary constraints. The creation of small rural hospitals and health centres is certainly the best expression of these efforts to maintain quality health services in remote areas thanks to innovative decentralised approaches. This could also be an answer to the problem of recruiting rural physicians as such centres provide for more career opportunities (see Box 2.8) with longer term perspectives. Some of these centres are run on a purely municipal level but more often as a co-operative venture between two or more municipalities. In most cases there is some form of support from the hospital so that both primary and specialised health services are delivered in the same centre. Health policy is to encourage the establishment of such centres, trusting that local health authorities will choose the most efficient way to organise the delivery of health services according to local needs.

Box 2.8. **Health Centre in Steigen**

The coastal municipality of Steigen (Nordland) had 4 500 inhabitants in 1972 and the population declined to around 2 700 in 2006. During this period, around 15 medical students born in the area graduated from the university but never came back to practice there. Some of the main reasons for these departures, in spite of relatively generous levels of possible earnings, seem to be isolation and hardship. A rural doctor in this municipality needs to cover 145 miles from his office to the hospital and must be on call every third to second night.

Steigentunet, a new rural medical centre of about 6 000 m^2 was opened in Steigen in 2001. This new centre constituted an innovative response to lack of rural physicians and costly dispersion of medical facilities: it replaced three health centres and three nursing homes dispersed over a large area. The centre is equipped with public health services, an emergency unit, hospital beds, a delivery room and a nursing home. As part of a co-operative agreement with the University Hospital in Tromsø, specific specialised health services are also offered on a decentralised/ambulatory basis. The centre comprises equipment for video conferences and tele-education and also the social security office. Staff numbers 19 (including 5 administrative personnel, 3 GPs, 2 dentists), plus 14 appointments for nurses and 20 for enrolled nurses.

The centre opens the perspective for rural general practitioners of further professional support. However, its development requires, besides funding from the municipality, additional aid from the hospital in Bodø that supervises the labour ward. Midwives spend one week each year at the nearest hospital, which contributes to the labour ward NOK 600 000-700 000 yearly. A part of this contribution is used to maintain the small emergency room (also saving costs in ambulance transportation to Bodø). Capacity of the nursing home is however a recurring problem. The new centre has contained costs, reduced by 10% between 2000 and 2002.

Source: OECD, from information provided by the Municipality of Steigen.

Social services for the ageing

As for other basic public services, social services are provided in Norway by municipalities on the principle of subsidiarity. The variety of services is very wide (see Box 2.9) and financing is carried out through discretionary municipal allocations of block grants and fees paid by patients living in public facilities or receiving home care. The municipality has freedom in deciding the service level and the way service delivery is organised. Most municipalities provide all social services themselves. In some cases, they contract out the service with a private business or join efforts with another municipality. These two options remain

Box 2.9. **Social services provided by municipalities in Norway**

- Help and/or financial support because of disability, age or other factors (alcohol and drug abusers).
- Relief assistance for people and families with comprehensive needs for care.
- Support for people who need help for leisure and social activities.
- Sheltered accommodation with services.
- Salary for people who care for children or relatives with comprehensive needs for care.

Source: helsetilsynet.no.

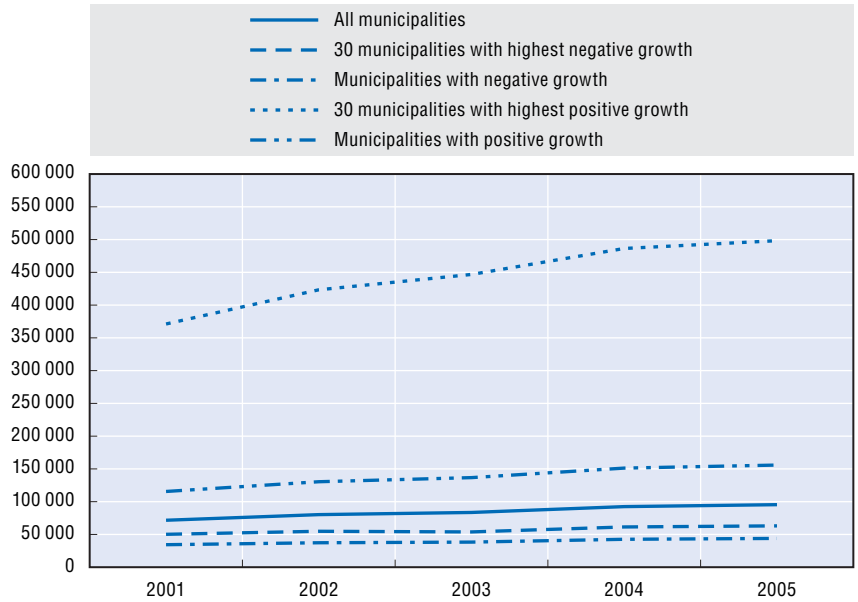
however limited in rural Norway because private sector social services are lesser developed than in urban areas, whereas great distances can constitute an obstacle to increased intermunicipal co-operation normally justified by economies of scale.

As the box above illustrates, most social services concern elderly people and because of ageing trends this is today a prime concern of municipalities. Efforts are made to keep elderly people at home as long as possible on the basis of freedom of choice but also because of the high cost of retirement homes and related services. This also implies increased efforts to organise in home services in a flexible fashion, with obvious recourse where possible to the private and/or voluntary sector. This goal, advisable both in social and financial terms, is actually a big challenge for many rural municipalities for lack of sufficient human resources within the voluntary or private sector, precisely because many young people tend to move progressively to urban areas.

The municipal health and care services have over the past 20 years undergone some major reforms that have affected both care for the elderly and user groups with various types of disabilities. According to White Paper No. 25 (2005-2006) "Long-term care – Future challenges", the main challenges for these services are the increased number of new user groups that require specialised treatment, the increased number of elderly people, the prospects of needing more expertise in dementia and complex illnesses, the shortage of personnel and the need of including social and cultural care alongside health care. All these challenges have been translated into costs.

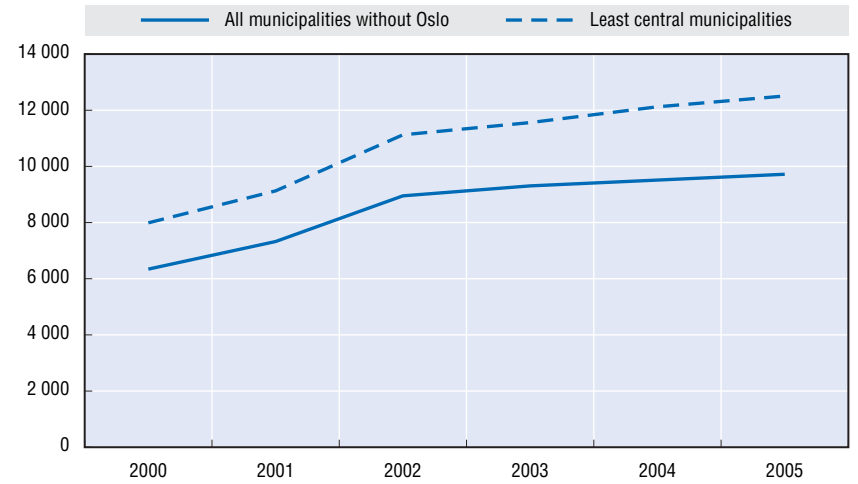
Care expenditure for the elderly is growing in all types of municipalities (see Figure 2.15) due to the evolution of wages for nursing and care (2001-2005). This overall trend however entails differences between types of settlements. When net operating expenditures per capita are considered for nursing and care services (see Figure 2.16), "least central" municipalities (those with difficult

Figure 2.15. **Average wages for nursing and care between 2001-2005 by type of municipality**



Source: Information provided by the Ministry of Local Government and Regional Development from Statistics Norway.

Figure 2.16. **Average net operating expenditures per capita, nursing care services in municipalities**



Source: Statistics Norway.

access to labour markets and small urban centres) have higher expenses than the average of all municipalities (without Oslo). An added difficulty (see Table 2.10) stems from the fact that staff per 10 000 inhabitants is higher in areas with population decline in comparison with the average of municipalities with positive population growth.

Table 2.10. **Staff with health-social education for nursing care per 10 000 inhabitants in 2005**

	Per 10 000 inhabitants
All municipalities	203.5
Municipalities with negative growth	239.0
Municipalities with positive growth	163.0
30 municipalities with highest negative growth	254.1
30 municipalities with highest positive growth	137.1

Source: Statistics Norway.

White Paper No. 25 suggests some strategies concerning: quality development, research and planning, capacity and skills upgrading (recruiting new 10 000 man-years by end of 2009, increasing the percentage of employees with professional qualification), collaboration with other national agencies and municipalities, medical follow-up, active care, partnership with families and the local community, strengthened legal protection. These strategies also focus on a weakness identified in other sectors: the need for more "joined up" government. The challenge is not only to improve co-operation between national agencies but also that municipalities benefit from increased collaboration, especially in sparsely populated areas where "joined up" efforts should entail efficiency gains. The policy document recognises that voluntary organisations, self-help nets, the family and private actors could support the strategy. Alternatives could be explored in a fashion similar to the one presented below and now developed in different rural areas in France (see Box 2.10).

2.4.4. Innovative approaches

As traditional service delivery is no longer sufficient to overcome the challenges posed to municipal authorities in areas of population decline, new strategies are devised to maintain equal living standards countrywide without increasing costs. Different types of measures can be implemented within the public governance and central place theory framework, in order to foster initiatives that allow a more co-ordinated approach from various service providers. These measures include in particular: merging local authorities, building up intermunicipal co-operation, fostering partnerships among different actors but also improving provider efficiency or enhancing user capabilities.

Box 2.10. **Improving the quality of life of the elderly in Saône-et-Loire (France)**

The county council of Saône-et-Loire (Burgundy) established a partnership with the company "Family Villas" and the French association of host families for the implementation of seven sheltered residences for elderly and disabled people. In order to accommodate the needs of both the people who are "in care" and of their families (can be the direct family but more often "chosen" family), specially designed housing was planned. On the ground floor, people in care have individual rooms and a communal dining room/kitchen. On the upper level, apartments are reserved for the host family. The designated care person has to meet specific professional requirements that are validated by the county council. The person who lives with a "host family" has specific rights, paying for the services received. The small size of the houses and the moderate investment costs make this form of co-housing attractive for rural municipalities, allowing elderly/disabled people to continue to live in their village. The "Villa Family" creates jobs and attracts young families. Ten "Villa Families" operate in France, the oldest since 15 years.

Source: governanceinternational.org

Building up on the public governance framework, problems of service delivery in rural areas can be approached by combining reduction of distances and improvement of the service experience considered a joint responsibility of consumers and service providers (Aasbrenn, 2006). Service providers can increase income by diversification, promotion and introduction of mobile services. Costs can be reduced for both private and public providers by introducing shorter opening time or by replacing staff by machines, like substituting a bank by a cash dispenser with enhanced functions. Finally, public providers can enhance their service delivery in these areas through mergers (reducing costs while maintaining services) and intermunicipal co-operation and partnerships. Consumers adapt to the distance problem through different measures ranging from multipurpose individual actions (using several services each time the user visits a regional centre for a single purpose) or network-based help: different persons can take care of businesses for neighbours when trips are planned to regional centres.

Innovation in service delivery in rural areas can thus involve both public and private actors, service providers and consumers. New venues for co-operation and organisation of services help to surmount the barriers of distance and low density while (ICTs) offer new perspectives. Combined with organisational and managerial innovation, adequate deployment of infrastructure and services in a shared mode can help to overcome the

different hurdles facing rural areas and particularly those with declining population. Tele-education and tele-medicine are beginning to prove their efficiency in many countries and Norway is no exception. Integration of different services in a networked fashion can safeguard the human factor (face to face or phone contact), while making best use of online services. This combined approach has been adopted by Services Canada: thanks to a 400-point network, 93% of Canadians can access federal government services within 50 kilometres from their home in 2006 (Canada Economic Development, 2007).

Multi-purpose approaches

Many private service providers, in particular retail and grocery shops are disappearing from remote and sparsely populated areas. The relevance of these providers is manifold: on one hand, they deliver basic services to the population; on the other, they represent places where the community gathers and enjoys social life. Recognising this multi-purpose role, that often overlaps into public service functions such as that of ensuring basic postal services (collection of mail and parcels), many countries, including Norway, have devised programmes aiming to support small rural grocery shops taking responsibility for other basic services. In Norway, this programme, called Merkur, financed by the Ministry of Local Government and Regional Development received until recently 7 million NOK per year (in 2007, NOK 9 million). Its prime focus is retailers in areas with population decline and long distances to other retail opportunities. Many of these retailers are in delicate financial situations for lack of regular or sufficient cash flow; often on the verge of closing down.

The programme has the following goals in the periphery: *a)* To facilitate the maintenance of good quality service provision; *b)* To ensure access to a grocery store near homes; *c)* To increase the awareness of the population and politicians of the importance of the grocery store in the neighbourhood. It offers competence to retailers through nine counsellors located all over the country and these fulfil a range of services aiming to support business development. Advice can be provided on how to obtain better bulk prices when ordering products, how to choose products, devise new product or service offerings. It extends to co-operation with existing private and public organisations like postal services or betting (Norsk Tipping) and tourist information services. Often, MERKUR counsellors help the retailers by mobilising the community to support the local shop by sufficient purchases to try and counterbalance the attraction exerted by shopping centres in nearby towns and cities.

So far 700 retailers from around 550 local areas have applied for the programme. Not all retailers in areas with population decline apply for the grant. Due to their strategic location within a community and in particular a central position offering the possibility to easily cater to tourists, some

retailers are able to make enough profit without any further help. This is the case of Rendalen, where in spite of the fact that many small shops in the territory have disappeared over years (see map above, Chapter 1, Section 1.4.3), there is no application for the MERKUR programme. The remaining retailers, now conveniently regrouped in a "business village" comprising a hotel, with the support of the municipality itself, are able to develop their activity without needing support from a programme like Merkur.

Norsk Tipping has entered the programme although it usually does not grant to a retailer a position for the betting business on any special district policy consideration, as the agency is only guided by considerations linked to its business development. Turnover from gaming must average at least NOK 8 000 per week (Norsk Tipping, 2005) so that a retailer can be authorised. Of the new 107 Norsk Tipping retailers in 2005, 12 were established in co-operation with MERKUR. The philosophy of the MERKUR programme has also raised the awareness of big private retail enterprises that take the goals of the programme as a part of their social responsibility. For instance, Norgesgruppe helps the Norwegian State Wine and Spirits Monopoly (Vinmonopolet) in regions without Vinmonopolet shops (report Norgesgruppe, 2004).

It seems however that there is room for more integrating strategies fostered by central government. The involvement of other national agencies and private enterprises as well as commitment from the side of the municipality could be explored in a more systematic way. While counselling retailers is a good strategy that relies in making their products more attractive and somehow more competitive instead of subsidising their business for being in remote areas, joint initiatives with other service providers could bring new insights in this type of solution.

In other countries, somewhat different approaches have been taken. In Germany, the "service supermarket" was developed in the small community of Bismark (Saxony) in the nineties. The concept of "service supermarket" (Lenk and Klee-Kruse, 2000) implies that in the same building (some times provided by the municipality) several service providers (public and private) join resources in order to provide services to a scarce population. The project in Bismark shows how public utilities (gas, electricity and telephone), grocery shop, post office, the employment office and other services can be dispatched in the same building. The experience requires considerable co-ordination efforts among the different parties, as the trained staff of the public services will act in many occasions on behalf of different providers. Furthermore, the introduction of ICTs helps the specially trained staff of the office in the event that users require more sophisticated counselling, on social issues for instance. In this case, the user can link up at distance in guided fashion with a civil servant from another administration. The "service supermarket" resembles

one-stop shops of public services. The novelty of the "service supermarket" lies in the fact that public services of different levels of government and also private service providers work together.

Electronic service delivery

ICTs can provide at least a partial answer to the problems that municipalities with population decline face regarding service delivery. To benefit from the full potential of ICTs, several conditions have to be met regarding infrastructure (broadband connection), usage by different age groups, the organisational challenges that technology poses on different service providers and the capacity to join efforts between different sectors. ICT has potential benefits for services in different sectors. This subsection focuses on general municipal services, on health (telemedicine) and on education (tele-education).

In 2006, broadband access in Norway covered 95% of Norwegian households. The figure appears impressive as compared to achievements in many countries, however full broadband access encounters limits in remote areas. Further, elderly people, overrepresented in remote areas, have the lowest access rate. Moreover, wide broadband coverage hides the fact that connections range from 1 Mb to 40 Mb and 170 Mb with few cases of 1 Gb. As demands on services will grow or some services have special bandwidth needs, room for improvement seems to remain large, particularly in the most sparsely areas experiencing population loss.

Broadband connections are implemented in a market where different technology providers (more than 130) and different major public customers like health, education and local authorities as well as national agencies interplay. The coexistence of many different network providers complicates interoperability (OECD, 2004c). Other big users, like hospitals, have put in place different security protocols than local authorities, which excludes the possibility of integrating doctors in the health and the municipal network at the same time. Initiatives to overcome fragmentation should not focus only on the technological side of the problem but also on the organisational aspects and on the willingness to share resources. According to the SINTEF STEP report on Høykom, ICT investments in schools are not shared with other municipal services or with the business community. As sharing could help bring down costs, the issue here relates to problems of horizontal co-ordination.

Norwegian Broadband policy was established in 1998 in a report issued to Parliament (St.meld.nr.38, 1997-1998). The programme, called Høykom was designed to motivate public agencies to use broadband applications and services and to focus specially on remote areas. The budget allocation of the programme from the Department of Trade and Industry amounted to EUR 8.5 million during the first period (1999-2001) and EUR 21 million for the

second (2002-2004), with an additional funding of EUR 11 million from the Ministry of Education and Research for the second period. This amount of money aimed at providing primary and secondary schools with broadband Internet connections. The Research Council of Norway oversees the programme. The more than 400 projects co-funded by Høykom are related to health, education and municipal services. Typology of projects according to main objectives is as follows (Lanestedt and Mogen, 2005):

- Conversion from traditional telephone services to Voice over Internet Protocol (VoIP);
- Initiation, consolidation and fostering of intermunicipal electronic collaboration;
- Establishment of digital learning exchange among institutions;
- Delivering public services online;
- Automating and speeding up processes in municipal services and health.

Following OECD recommendations of not distorting markets through public investment in broadband based services, Høykom did not fund broadband infrastructure until 2002, when school infrastructure projects started to be financed. An independent evaluation report by SINTEF STEP on Høykom criticised government policy of following strictly neo-classical equilibrium models applied to the telecommunication sector. Different arguments can be produced against neo-classical dogma. The SINTEF STEP report on Høykom maintained that the theory does not deal with real world competition as the dynamic forces leading to equilibrium are not taken into account. It further conveys the idea that innovation, economic growth, change and social cohesion (*i.e.*, avoiding the digital divide, for instance) are catalysed through public sector investment in infrastructure, especially when market forces do not find it profitable in certain areas. Besides, if the avowed goal of the government is to grant equivalent welfare services to citizens regardless of their place of residence, broadband could be considered as a part of the overall policy. There is a contradiction between welfare services being subsidised in remote areas while restrictions are imposed for broadband infrastructure, which permits to share resources in those services.

Norwegian local authorities have had to accept local monopolies of broadband operators with the disadvantages of vertical integration, whereas competition is considered beneficial in terms of providing a cost-effective choice of services. In this context, broadband deployment in Norway has found pragmatic responses to such limitations. The absence of Høykom in infrastructure projects has been counterbalanced by local public investment through semi-public or public hydroelectric power station companies that have built up access for public and private customers. In about 50 of the

130 companies, municipalities are participating as owners (Norsk Telecom, 2004, quoted in Skogseid, 2005). On the other hand, partnerships can permit to develop and operate local broadband infrastructure, as the example of a rural region in "Sogn og Fjordane" shows (see Box 2.11). These local initiatives offset the absence of national operators willing to invest and the restrictions imposed on Høykom to finance infrastructure. However, users have growing quality demands on ICT technologies that imply communication between providers and keeping up with investment by introducing new technologies (Hansteen, 2005). Standardisation of processes and protocols thus becomes very important.

Box 2.11. **Partnership for broadband projects in "Sogn og Fjordane"**

Firdanett and Kapasitetslaget projects deployed in "Sogn and Fjordane" respond to the needs of local business communities and the local public sector. In Firdanett the demand for high-speed Internet access increased but no national provider was willing to make investments in the area. In Kapasitetslaget the main stakeholders of the project are the regional public sector, the businesses and the college, while in Firdanett the local public sector and different enterprises funded the initiative. Local specificities were taken into account because infrastructure was built on the installed-base, rather than copying top-down approaches used when developing traditional telecom infrastructure. Potential first adopters and local organisations, with existing infrastructure to build upon, can thus take the responsibility of being service providers to facilitate broadband access in an area.

Source: Skogseid, Ingjerd (2005), *Market Driven Development of Broadband Infrastructure in Rural Areas*, Western Norway Research Institute, IRIS.

In spite of the above mentioned limitations that reduce its potential impact, the Høykom programme seems to have been rather successful in its endeavours. According to the SINTEF STEP report, the positive results of the programme allowed its extension several times. Approximately 90% of the projects have gone to schools, health, social services and other municipal services. Around 70% of the projects have offered new or improved services to different customers (pupils, teachers, patients, doctors, business and citizens in general). In nearly half of the cases, the project has led to a kind of formal or informal partnership. Finally, the quality of the services has improved in half of the cases while efficiency gains have been obtained in around a quarter of the projects. As regards the avowed aim of improving services in rural areas, around half of the funding has been transferred to institutions in the periphery, although the benefits in terms of results have not been documented.

Tele-education

The initiative to improve broadband infrastructure for the benefit of education is channelled by the Ministry of Education through "Høykom-School" since 2002. Unlike other Høykom projects, infrastructure is here subsidised in order to correct market failures for certain niches and territories. The SINTEF STEP report on Høykom shows that 363 schools scaled up their connections thanks to Hoykom support. Each project received about EUR 16 000 average in order to start up the project, (see Table 2.11). Without the funding, broadband would have come much more slowly. However, bigger benefits could be drawn from the existence of state of the art ICT infrastructure in schools if connections were used by other services or by the local business community or if tele-education projects were developed more systematically (see below). This would imply co-ordination and partnerships with other stakeholders that could help to finance additional projects for pupils but also adults through distance learning.

Table 2.11. **Number of projects and investment in "Høykom-School" programme**

Year	Høykom	"Høykom School"	"Total (mill NOK)"	"Total (mill euro)"
1999	12.0		12.0	1.5
2000	18.0		18.0	2.3
2001	38.5		38.5	4.8
2002	53.5	48.0	101.5	12.7
2003	51.5	23.0	74.5	9.3
2004	66.5	16.0	82.5	10.3
2005	50.0	0.0	50.0	6.3
Total	**290**	**87**	**377**	**47.2**

Source: Hansteen, Kjell (2005), *Norwegian and Swedish Broadband Initiatives (1999-2005)*, HØYKOM report No. 505, Ministry of Modernisation, Norway.

Tele-education is about transporting knowledge and expertise with the help of ICT and creating interactive learning environments in the process. E-learning saves expenses in travelling and living costs of being away from home. It also allows the share between family, work and life-long learning for the adult population. The Internet era has facilitated the access to higher education for those living in remote and rural areas. As for primary and secondary education in remote areas, e-learning is now also developing and is often the only solution left to continue offering sufficient choice in curricula or even maintaining a school in a given location. If rural schools want to provide a wide choice to pupils, they need to co-operate and share resources with other schools through videoconferencing. The advantages offered by

such solutions are eloquently illustrated by the example of the upper secondary school located in the municipality of Stor-Elvdal in Hedmark that the OECD team visited (see Box 2.12).

The major relevant feature of the project is that it was locally conceived and received initial start-up financing from the Ministry of Education. After several years of such support, the project is now self-reliant and is pursued without any additional state funding. The technical implications of the project as well as its pedagogical aspects seem to be the result of the mobilisation of local resources more than reliance on advice from the national level or on networking with similar experiences elsewhere in the country. It would certainly be useful to provide more systematic support to this type of initiative and to ensure dissemination of results while monitoring the process. Organised networking could easily bring its benefits to other rural areas where similar challenges exist. Such efforts could well be co-ordinated at the national level precisely through the Internet. The logic of such an engagement would also be to bring added value to the efforts deployed through Hoykom to ensure that schools are equipped with adequate broadband infrastructure.

Telemedicine

According to the EU Commission's programme "Advanced Informatics in Medicine", 1991 (see Blomberg, *et al*., 1999), telemedicine can be defined as "rapid access to shared and remote medical expertise by means of telecommunications and information technologies, no matter where the patient or relevant information is located". Telemedicine in Norway is part of a national strategy to increase co-operation and co-ordination between hospitals and general medical services, to increase the skills of health personnel through e-learning and to provide better specialised services in sparsely populated areas. Up to now, telemedicine in Norway has focused on remote consultations and diagnoses through interactive sound and pictures and simultaneous communications between the patient, the general practitioner and the specialist. A second area of telemedicine use in Norway is the electronic transfer of patient information by the GP to the specialist. In this type of consultation, the patient might not be present when different information transactions are fulfilled. The first type of interaction demands higher resources and co-ordination costs between the different parties.

In the Norwegian context, factors that facilitate or foster the use of telemedicine are: the stated goal of delivering equal health care to all citizens regardless of place of residence, potential efficiency gains through the use of ICT and the principle whereby health care should be provided at the level closest to the patient. According to certain authors (Gammon, 1999), there are several factors that restrain or constitute a barrier for reaping the full benefits of

Box 2.12. **An example of tele-education in an upper secondary school**

The upper secondary school of Stor-Elvdal (community of Koppang) in Hedmark (130 pupils) serves several neighbouring municipalities, in particular Rendalen. Stor-Elvdal has a declining population of close to 2 800 inhabitants (density of 1.3 per km^2) and Rendalen, also declining, with 2 045 inhabitants today (and only 0.64 per km^2) is the largest municipality in South Norway (3 178 km^2). Staffing problems made it difficult to ensure teaching of all subjects because of school schedules and availability of teachers. Involving teaching resources from other schools in the area through videoconferencing was the only solution permitting to offer a varied curriculum to pupils attending the school in Koppang. This was done through an agreement with the school located in the municipality of Trysil.

Regular courses are offered in one school, where the teacher and pupils are present and they are also attended by pupils in the other school from a classroom equipped with videoconferencing. The virtual classroom is serviced by two screens, microphones, loudspeakers, computer and the telecommunication system that connects with the teacher and the other pupils. One screen allows seeing the pupils and the teacher at the other end. Another monitor shows the blackboard with the writing or slides of the teacher. The communication system allows interactive sessions in which teacher questions students at both ends.

The experience started as a national project with government support of NOK 250 000 per year during four years. After initial support, the schools had to self-finance the experience. This method was initially used for four subjects (chemistry, mathematics, physics and social studies) with the teacher being either at one end or the other. In 2006-07, it has nonetheless been used only for chemistry, which probably does not offset the high costs incurred.

Without this project, chemistry could not have been offered to pupils in Koppang. The main reason of implementing tele-education is to offer courses which are not financially sustainable by one school or the competence for that subject is absent in a specific school. According to this experience, students obtain similar results in traditional teaching and in this innovative system. Both parents and pupils seem to be satisfied because the school can still meet demand but the experience is not yet embraced by all teachers, explaining subject matters discontinued.

Source: OECD with information provided by the school administration of Koppang and by Statistics Norway.

telemedicine. Those factors seem to be enduring, as they are pointed out in 1999 and in 2006 for the same issues: relationship between health authorities in different government levels, limited involvement of GPs in telemedicine and uneven distribution of savings and investment burdens among stakeholders.

The reasons explaining the limited involvement of GPs in telemedecine are diverse. Lack of funding at the municipal level appears to be a major hurdle. Uncertainty related to questions of responsibility when using telemedicine are another. Some questions remain unanswered in the present system: is a doctor accountable for the treatment of a patient he/she does not see? GPs seem to still need more practice with the technology because there are relatively small numbers of patients eligible for telemedicine. Perhaps incentives could be tied to the use of telemedicine in a more intensive way.

While the application of telemedicine nationwide still needs further efforts from all sides, some individual documented examples show that economic benefits can be materialised. The Alta District Medical Centre (a Høykom project) reports yearly benefits of NOK 12 million due mainly to lower transportation costs (Lanestedt and Mogen, 2005). A hospital in Telemark reports NOK 50 000 per week in reduced taxi expenses related to the transportation of X-ray pictures. Another 2004 report states that the Central Norway Regional Health Authority has saved around NOK 70 million per year as a result of telecommunicating X-ray images. As the patient no longer needs to travel when telemedicine is applied, significant travel cost reductions appear. An indirect positive benefit can also be mentioned: reduced travel to medical centres results in more time spent in the workplace and less absenteeism. Alta medical centre also quotes the potential financial benefit of treating patients for longer periods at home before sending them to a hospital or institution.

Contrary to other fields like education or e-government, the Høykom programme has been less focused on health applications. The Ministry of Health and Care Services, as owner of regional hospitals, concentrates resources on the sector and has invested considerably in scaling up bandwidth for transmission of electronically relevant health documents. If Høykom is to play an increased role in different parts of the health community, new funding would be required. This could help in supporting initiatives of GPs, as their upgrading abilities depend on the usually limited municipality purse (Hoykom, 2004).

The results of telemedicine can be summed up in the following way (Breivik, *et al.*, 2007). Economic benefits depend mainly on the volume of service use. In many instances, telemedicine practitioners do not even report these benefits. It seems that trust in the system still needs reinforcing. A number of studies report qualitative benefits but without clear measurement of

improvements. The current appraisal of benefits is limited because only pilot programmes and small-scale services have been evaluated up to now. Apart from analysing cost-effectiveness, the systematic analysis of patient satisfaction and identified benefits for professionals could usefully be pursued. Better integration between the legal, technological and organisational systems is also required if telemedicine is to fully develop its potential. Therefore, economic and qualitative indicators relevant in the Norwegian context could usefully be defined in order to measure the benefits of telemedicine.

2.4.5. Summing up

The broad picture

Municipalities with declining population are generally small but of variable dimensions so the phenomenon is not linked to any specific factor relating to size. They are characterised by overrepresentation of the elderly and under-representation of people of school and working age. Progressive disappearance of service points (schools, post offices, grocery shops, petrol stations) is a common feature leading to increasing distances between place of residence and location of public and private service provision. Decrease of the income tax base and block grants linked to headcounts and correlative increase of equalisation grants are a direct consequence of the negative growth of working and school age population. Costs of public and private services increase not only because of the declining numbers of inhabitants with maintenance of similar fixed costs for many services but also as a consequence of an increasing elderly population with intense needs in personal care. Recruitment of skilled medical personnel in remote declining areas is both costly for the municipality and difficult, as rural areas remain less attractive than urban areas with more patients.

Evaluation

The assessment in international comparative terms of service quality in these municipalities judging by the accomplishment of national standards and by site visits is highly positive. Rural communities are able to have well kept home care residences, health centres, school facilities and municipal service points for the population living in these areas. Besides, schools and the municipality provide cultural amenities year round that are only provided in similar areas of other countries in the summer period. However, these services are costly and in the longer run, under increased ageing pressures, present trends are unlikely to change. The current model of transfers to municipalities and the national control of inputs and activities standards seems to work properly. Nonetheless, can more systematic use of benchmarking to better analyse the impact of different cost factors such as higher than proportional salaries or higher staffing ratios, help in achieving higher cost-efficiency?

Perspectives

Concerning shortage of teachers in schools, recent measures to enhance teaching careers and to attract teachers to rural areas will only produce effects slowly and they will not entirely solve the problem of maintaining a sufficient number of schools in remote areas. Could more systematic use of video-conferencing and tele-education contribute to solving part of this dilemma?

In the health sector, how could recruitment bottlenecks, now dealt with at the municipal level, be solved, avoiding competition between municipalities on salaries and advantages? Could plans to attract young medical students and nurses at the beginning of their career be devised? Could co-operation between hospitals and rural health centres be stepped up by development of tele-health?

Concerning the elderly, could new approaches for retirement homes, such as the one indicated for rural France, based on family type approaches, be considered in Norway? Service delivery to elderly and handicapped people could thus be shared between the private and the public sector. In sheltered residences for elderly and disabled people, "families" living upstairs and elderly living downstairs could be of inspiration for reducing public costs of elderly care and using care as an economic growth factor that creates part-time jobs.

In the area of rural retail businesses, with reference to the concept of multi-service supermarkets, could private entrepreneurs be provided with facilities for retail in selected rural areas, in particular in the outlying zones of municipalities where shops have closed completely, obliging people to travel great distances for certain services? In this case, to facilitate business and develop synergies, additional public services (postal) and quasi-private services could also be provided (wine and spirits, betting), by coverage of certain additional costs.

Notes

1. For more details, see Edvardsen (2004) and Foss and Selstad (1997).
2. The SND (the Norwegian Industrial and Regional Development Fund) was formed from a merger of the Regional Development Fund (DU), the Industrial Fund and the Fund for Small Enterprises.
3. This section is based on research undertaken by the European Policies Research Centre at the University of Strathclyde, Scotland, for the EoRPA Consortium.
4. St.meld.nr.25 (2004-2005), *Om regionalpolitikken*. The title of the English summary of the White Paper underlines the policy shifts involved: Ministry of Local Government and Regional Development (2005), *A New Regional Policy – For Different Regions: Globalisation Changes the Conditions for Regional Growth*, Oslo.

5. Districts are sparsely populated, remote areas which are traditionally targeted by regional aid but are not the same as rural areas since they include urban centres in the North (Tromsø and Bodø). Extra focus on districts is reflected in the Norwegian title of the 2006 White Paper, whereas the title of the 2005 White Paper did not mention districts.

6. The decrease in regional development funding (under the 13.50 budget programme) in 2007 reflects the reintroduction of the social security concession; as a result, compensation for loss of this concession has been reduced. If account is taken of this, the budget increased by NOK 153.5 million (10%) in 2007. The local government funding in the table relates to support via the general purpose grant scheme; specifically earmarked support for counties and municipalities is excluded.

7. Further information on such initiatives in the Nordic countries is available in Nordic Working Group on Cities and Regions (2006). For policy information covering the EU and Norway see Yuill and Vironen (2006).

8. A co-operation project extending to five cities, implemented between 1993 and 2000.

9. Report No. 24 to the Storting (2003-2004), National Transport Plan 2006–2015, 12 March 2004.

10. Tax revenue from licenses for fish farming could however serve municipal budgets but the product of these fees is perceived by the Ministry of Fisheries and Coastal Affairs.

11. For an overview of the historical development of the regional aid guidelines see Wishlade (2003). The guidelines themselves can be found at *Guidelines on National Regional Aid for 2007-13*, OJEU C54, 4 March 2006, pp. 13-44.

12. *Guidelines on National Regional Aid for 2007-13*, OJEU C54, 4 March 2006, paragraph 6.

13. This information in this and the following paragraph is drawn from Ministry of Finance (2006), *State Aid – Regionally Differentiated Social Security Contributions*, submission to the ESA, 12 June. See also Section 1.4 for a discussion of the periphery index.

14. With a range of academic studies quoted in support of this conclusion, see EFTA Surveillance Authority Decision of 19 July 2006 on the notified scheme concerning regionally differentiated social security contributions (Norway) (Decision No. 228/06/COL).

15. Under State Aid rules, *de minimis* support relates to small amounts of state aid which do not require prior notification. *De minimis* support can be paid to an individual firm up to EUR 200 000 over a three-year period (up to EUR 100 000 up to the end of 2006) without prior notification.

16. See EFTA Surveillance Authority Decision of 19 July 2006 on the notified scheme concerning regionally differentiated social security contributions (Norway) (Decision No. 228/06/COL), paragraph 3.10.

17. Dyrstad (1992) estimated the incidence effect of a regional change in social security tax to be 30% in the long run, while Johansen and Klette (1997) estimated the incidence effect of a regional change to be between 60 and 100%. Johansen (2001) found an incidence effect of 20% (not statistically significant). All of the studies were carried out in the manufacturing sector.

18. NUTS III in Norway is the county level.

19. This compares with a 2000-06 ceiling of 25.8%; Norway was alone in the EEA in having an increased population quota for 2007-13. This has resulted in 24 new municipalities being included in the 2007-13 map.
20. Ministry of Local Government and Regional Development figures.
21. St.meld.nr.8 (2003-2004), *Rich Diversity in the North: About the Action Zone in Finnmark and North Troms*. In addition to Finnmark, the Action Zone consists of the municipalities of Karlsøy, Lyngen, Storfjord, Kåfjord, Skjervøy, Nordreisa and Kvaenangen in North Troms.
22. The Integrated Management Plan for the Barents Sea and the Ocean Areas off the Lofoten Islands – see Office of the Prime Minister, *Integrated Management Plan Ready*, Press release No. 45-06, 31 March 2006.
23. There remain nonetheless a large number of research institutes of different sizes in Norway, working for both business and the public sector. They are responsible for about one-quarter of all Norwegian R&D.
24. An example of a VS 2010 project: a graphics industry sector project co-ordinated by Oslo Teknopol (see further) with applications in tourism.
25. The Oslo Alliance regroups 56 municipalities, including the municipality of Oslo and two counties (Akershus and Ostfold) since 2004.
26. *The Economist Intelligence Unit*'s Worldwide Cost of Living Survey for 2007 ranks Oslo as the most expensive city, followed by London, Tokyo, Moscow and New York.
27. Trondheim played a major part in the history of the country since the Viking era and Norwegian kings are still crowned in Trondheim cathedral.
28. Total cost: EUR 1 234 968.
29. The university opened in 1972.
30. See Section 3.4.2 on intercounty co-operation.
31. For instance reduction in the number of pupils attending a school meaning reduced grant levels that do not take fixed costs into consideration.
32. Mandatory practitioners are medical graduates who are serving in general practice in order to be licensed.

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