

Plan

From Idea to Value

The Government's Plan for a Comprehensive
Innovation Policy



NÆRINGS- OG HANDELSDEPARTEMENTET

The Ministry of Trade and Industry



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1. Preface

The Government's vision

Norway shall be one of the most innovative countries in the world, where resourceful and creative enterprises and people are given opportunities for developing profitable business. Norway shall be in the lead internationally in important areas, in terms of knowledge, technology and wealth creation.

What factors influence the ability of a country to innovate? Why is it that some businesses appear to be more innovative than others? What triggers innovation, and what factors may hamper innovation?

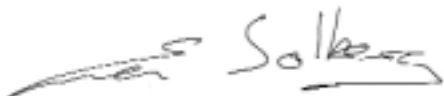
Norway has to pose such questions if we are to succeed in improving wealth creation and safeguarding future welfare. Norway is part of an international setting. Changes in markets, knowledge and technology necessitate continuous adaptation within Norwegian industry. Other countries are in the process of establishing wide-ranging strategies for innovation and growth, and the EU has launched its pro-active Lisbon Strategy.

At present, public sector wealth stands in the way of a much-needed appreciation of the need for adaptation of the Norwegian economy. The fallout from failing to adapt may be dramatic – at first, for businesses in the sector exposed to competition and their employees. In the longer run, existing welfare schemes will also be at risk.


To meet these challenges, the Government has embarked on the development of a comprehensive innovation policy. That is a long-term and wide-ranging task. This plan represents a first step of a long journey.

Innovation starts with individuals, businesses and institutions. One of our main challenges is the creation of a culture for innovation, which will motivate us and enable us to achieve pre-eminence within certain areas. The authorities will contribute by making conditions as favourable as possible, and by removing any impediments to progress.

Innovation policy must be comprehensive, and adopt a long-term approach. This plan will contribute to a more coordinated and targeted effort, across various policy and administrative areas. We will at the same time improve cooperation between private and public sector players, and across different levels. Only in this way can we lay the foundation for high growth regions, future employment, and welfare.



*Minister of Local Government
and Regional Development*



Minister of Education and Research



Minister of Agriculture



Minister of Petroleum and Energy



Minister of Trade and Industry



2. Why the need for a comprehensive innovation policy?

Industrial developments are characterised by increased internationalisation, rapid technological development, new markets, faster transactions, and intense competition. Globalisation offers scope for reaping great benefits through international trade, and changes the geographical distribution of labour and activities across countries and regions. Localisation decisions are less sensitive to the proximity of raw materials, and more sensitive to the proximity of business and competency centres, as well as markets. Labour-intensive production is shifted to locations offering cheap labour, or it is automated. New technology reduces labour requirements, thus resulting in lower employment within traditional manufacturing industry.

These developments suggest that many high cost countries – like Norway – will continue to see standardised production being ousted or moved to other countries. It becomes more difficult to compete with low cost countries, where the best of existing technology is increasingly available. Countries that are already industrialised must increasingly focus on the development of innovative and knowledge-intensive industry, in order to

remain capable of financing a high level of welfare. High quality, together with new products and services, are needed to obtain favourable prices.

Sustaining the current level of welfare is a considerable challenge – especially in the longer run. Growth impulses from the petroleum sector to the rest of the Norwegian economy are expected to diminish in the coming years. This means that the economy must be capable of adaptation and innovation. Moreover, government revenue from the petroleum sector is in decline, whilst public sector expenditure commitments relating to health, care and pensions are on the increase. As an example, old age and disability pensions absorbed 9.2 percent of GDP in 2002. Said share is expected to approach 20 percent by 2050 (see Chart 2.1). An aging population will also impact on other public sector expenditure items. It is expected, for example, that the number of hours worked within specialist health services and local government services will increase by a good 60 percent during the 2002 – 2050 period¹. This suggests that petroleum revenues need to be managed with long-term considerations in mind.

1 Report No 1 (2003-2004) to the Storting, 2004 National Budget, Ministry of Finance.

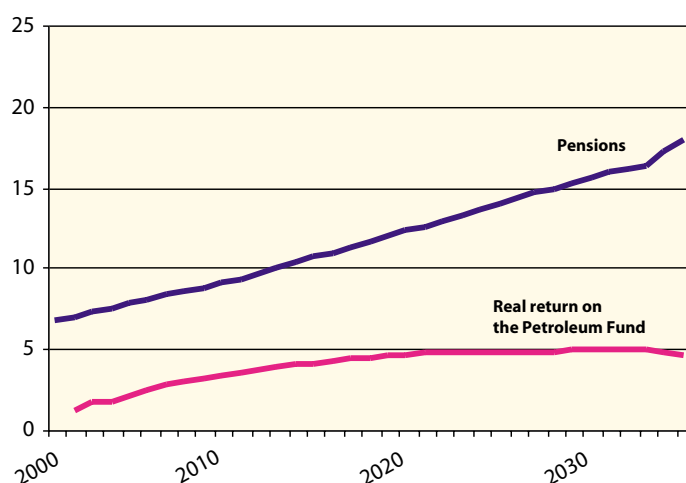


Chart 2.1 Expected real return on the Petroleum Fund and expenditure on old age and disability pensions, as a share of GDP (%).

The infusion of petroleum revenue into the Norwegian economy has contributed to reducing employment in the sector exposed to competition, thus releasing manpower for use in the production of various services, hereunder within the health and care sector. However, it is important to prevent such trend from developing too fast or too far. Not least because it will prove relatively difficult to replace economic activity sheltered from competition with new, innovative ventures that are competitive in international markets. Industry that are less exposed to international competition may impede the economy's capacity for growth. Businesses faced with international competition depend to a far greater extent on innovating and being efficient to succeed in the marketplace.

Human capital in the form of manpower and competency makes up the main part of the national wealth of Norway, and how it is used is of decisive importance to our ability to innovate and to create wealth. The robust growth of the Norwegian economy throughout the 1990s resulted in a very high employment ratio and low unemployment. However, sickness absence, recipients of disability benefit, and people taking early retirement, all increased significantly over the same period, thus reducing the available workforce. The availability of manpower will be considerably lower in coming years. This takes place concurrently with a steep increase in manpower needs, in particular within the health and care sector. Consequently, modernisation

of the public sector is of decisive importance to safeguarding the delivery of good public services, without the sector exposed to competition being depleted of more manpower than is compatible with sustaining a sufficiently large such sector.

The level of education in Norway increased during the 1990s – and is now very high in international terms. Nevertheless, there is a significant shortfall as far as certain types of qualified manpower are concerned. The OECD recommends that higher education be increasingly tuned into the needs of economic life. Science and technology subjects are of particular importance in this context. Moreover, the quality and capacity of various types of education are identified as being more important than a continued increase in the general level of education.²

The competitiveness of Norwegian industries in terms of costs has deteriorated in recent years. This is partly a reflection of distinctly higher wage growth than that of our main trading partners, and partly the result of the appreciation of the Norwegian krone over the last few years, which appreciation has not been fully reversed. Increasing the productivity of business and industry exposed to competition is therefore an important challenge. It gives cause for concern, from this perspective, that Norwegian businesses innovate less than those of several other European countries (see Chart 2.2)³. Moreover, about half of Norwegian businesses do not deem innovation and creativity to be necessities,

2 OECD (2001): "Education Policy Review – Lifelong Learning in Norway".

3 Innovation Survey, Statistics Norway, 2003.

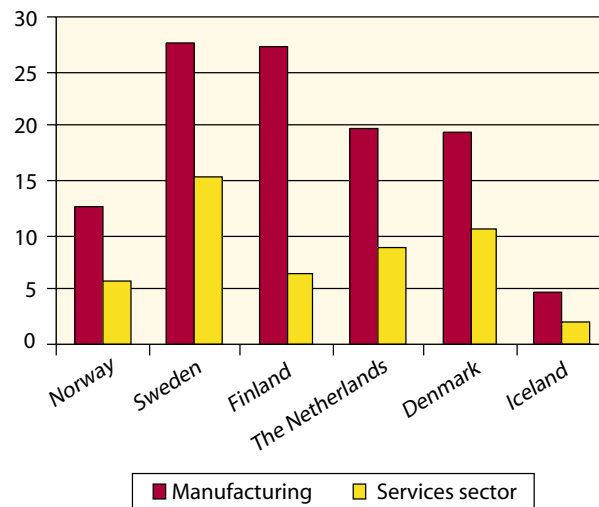


Chart 2.2 Turnover of new or significantly improved products as a share of total turnover

which may suggest that many Norwegian businesses operate within protected markets characterised by little competition. At the same time, Norwegian investment in research and development (R&D) is considerably below the average within the OECD area.

There are considerable regional differences as regards the focus on development, growth and innovation. Differences in terms of industrial structure and distances to important markets and relevant knowledge centres may also translate into different innovation capabilities. In addition, continued conversion from capital- and labour-intensive industries to more knowledge-intensive industries may result in a lower level of economic activity in rural areas.

Given the right prioritisation in coming years, Norway is well placed to succeed in a knowledge-based global economy. The country enjoys a solid

and stable economy. Considerable investment has been made in terms of research, education and physical infrastructure. The country has good access to natural resources that offer considerable potential for processing industry. ICT is extensively used by enterprises, as well as by the population in general. Moreover, Norwegian trade and industry is characterised by trust and good cooperation internally within businesses, as well as between employer and employee organisations.

An economic policy that contributes to stable development in terms of production and employment is a necessary, but not a sufficient, condition for safeguarding the competitiveness of Norwegian industry, and the current level of welfare, over time. Businesses and industries must be offered scope for developing long-term competitive advantage. Pro-active policies aimed at improving the innovation capability of Norwegian businesses are keys to facing this challenge.



3. Innovation and wealth creation

The Norwegian economy is undergoing continuous change. Some businesses and sectors are growing, whilst others are becoming smaller. Innovation is the strategic response of businesses faced with increased competition and a need for adaptation. Innovation offers new and better products and services, increased profitability, and a foundation for long-term growth.

Innovative businesses are businesses undergoing learning. They are businesses that develop or obtain the competency necessary for renewal, whether from customers and suppliers, from various public or private knowledge institutions, from private consultants, or from the public policy instrument system. Individuals and businesses are responsible for, and the driving force behind, any process of innovation. However, public authorities

have an important role to play in facilitating wealth creation in general and innovation in particular.

3.1 Innovation

Innovation may refer to a new product, a new service, a new production process, application or organisational structure, which is launched in the marketplace or made use of in production, for the purpose of generating economic value. Innovation is based on new knowledge and new combinations of existing knowledge. New knowledge may be gleaned from practical experience or generated through systematic research and development, and is reflected in gradual modifications and improvements, or in more extensive and radical innovations. The degree of diffusion of innovations in society is of critical importance to a country's innovation capability.

Box 3.1 Strong regional industrial and knowledge centers

There are strong regional industrial and knowledge centers in several parts of the country. These are partly founded on regional advantages and specialties. Kongsberg is an example that demonstrates how new knowledge and combinations of existing knowledge can over time develop an internationally competitive center.

Kongsberg is today one of Norway's most important high technology centers. Large parts of the Kongsberg center emanate from Kongsberg Våpenfabrikk (KV). Following the closure of KV, Kongsberg's manufacturing industry has been restructured from traditional machine shop occupations to more engineering-oriented occupations. Manufacturing industry is very knowledge intensive, with a high degree of international ownership. The town is also a centre for education, with Buskerud University College educating engineers. The history of Kongsberg, with its manufacturing industry tradition, has been of great importance to the development of high technology businesses achieving international success.

Leksvik in Nord-Trøndelag offers an example of a small place that is also a significant high technology manufacturing center. The industrial development of Leksvik has been swift, and was in large part based on a fixtures factory (now ORAS Armatur) established in 1958. Developments in Leksvik illustrate the importance of entrepreneurs in the creation of local wealth creation centers. The about 20 manufacturing businesses currently operating in Leksvik have a total of 600 employees and an annual turnover of approximately NOK 700 million. Most of these businesses operate within the industries of grinding machinery, plastics, sanitary fixtures and electronics. The Leksvik center is in close contact with research institutions, especially NTNU and SINTEF. In addition, the upper secondary school forms part of the local network, and offers educational facilities adapted to the needs of local manufacturing industry.

Innovation takes place within all industries, within new and old businesses, and within all technologies. Although the concept of innovation is often linked to high technology industries, it is nonetheless common and, not least, important for innovation to occur also within industries that are less technology-intensive. An example is offered by

the services sector, which has in recent years created considerable value through innovation. There are also numerous examples of stricter international environmental requirements promoting innovation within businesses that have to adapt to a changed regulatory framework.

Box 3.2 Complex diagnosis here and now – Afinion

Afinion is an in vitro diagnostics innovation, which will offer laboratory quality results for a number of tests within 2 – 5 minutes. Afinion allows doctors to perform such tests in the presence of the patient. This will save time and costs on the part of both patients and doctors.

The company behind the development of Afinion, Axis-Shield, is experienced in exploiting its competency within the development, manufacturing and marketing of diagnostic products. Afinion was initiated as an exploratory project in spring 2000, and close cooperation with businesses in England, Sweden, Canada, Germany and Norway was established to implement such project. Axis-Shield is planning to launch Afinion in Europe and the US in 2004. Completion of the Afinion project may make Axis-Shield one of the benchmark businesses within its niche.



Box 3.3 From sturdy to trendy - Figgjo

Figgjo Kraftselskap Ltd. was established in 1941, and manufactured china for private homes until 1965. It became involved in ceramics production on the basis of local clay, local ceramics competency, and electricity from the power station. To safeguard its future, Figgjo started in the mid-1960s to develop product series that in terms of design and functionality were targeted at professional kitchens (hotels, restaurants, cafes, cafeterias, catering and institutions). Private and professional china thereafter featured alongside each other at Figgjo. However, from 1985 profits started to reflect the disjointed design and manufacturing requirements, as well as methods of distribution, implied thereby. In 1995, Figgjo decided to focus exclusively on professional kitchens.

Figgjo is now operating to the philosophy that a close relationship between design and technology is necessary to maintain swiftness in the development process. Figgjo's close relations with the food industry offers an insight into trends, thus inspiring further product development. The main competitive advantages of the company are that it is a trendsetter and that it boasts leading competency within product development and design.



Innovation processes take on very different forms, but share certain common characteristics. Innovation takes place, first and foremost, through interaction with a number of different players, with both cooperation and competition having a stimulating effect. The players will often be customers, suppliers, competitors, financial institutions, knowledge institutions, consultants and the authorities (see Diagram 3.1). If these interact in a network, there may develop relations characterised by trust, a shared frame of reference, a shared identity, and reduced transaction costs.

Geographical proximity between players will typically enhance such effects, and may contribute to the development of so-called clusters. However, too much of a focus on local relations may come at the expense of national and international relations, and may result in a community blocking out external impulses. Consequently, international contact for purposes of tapping into new knowledge is of importance to the ability of a region, an industry, or a country to innovate. Innovation itself is often multidisciplinary, and successful innovations depend on product-specific competency being supplemented by other skills.

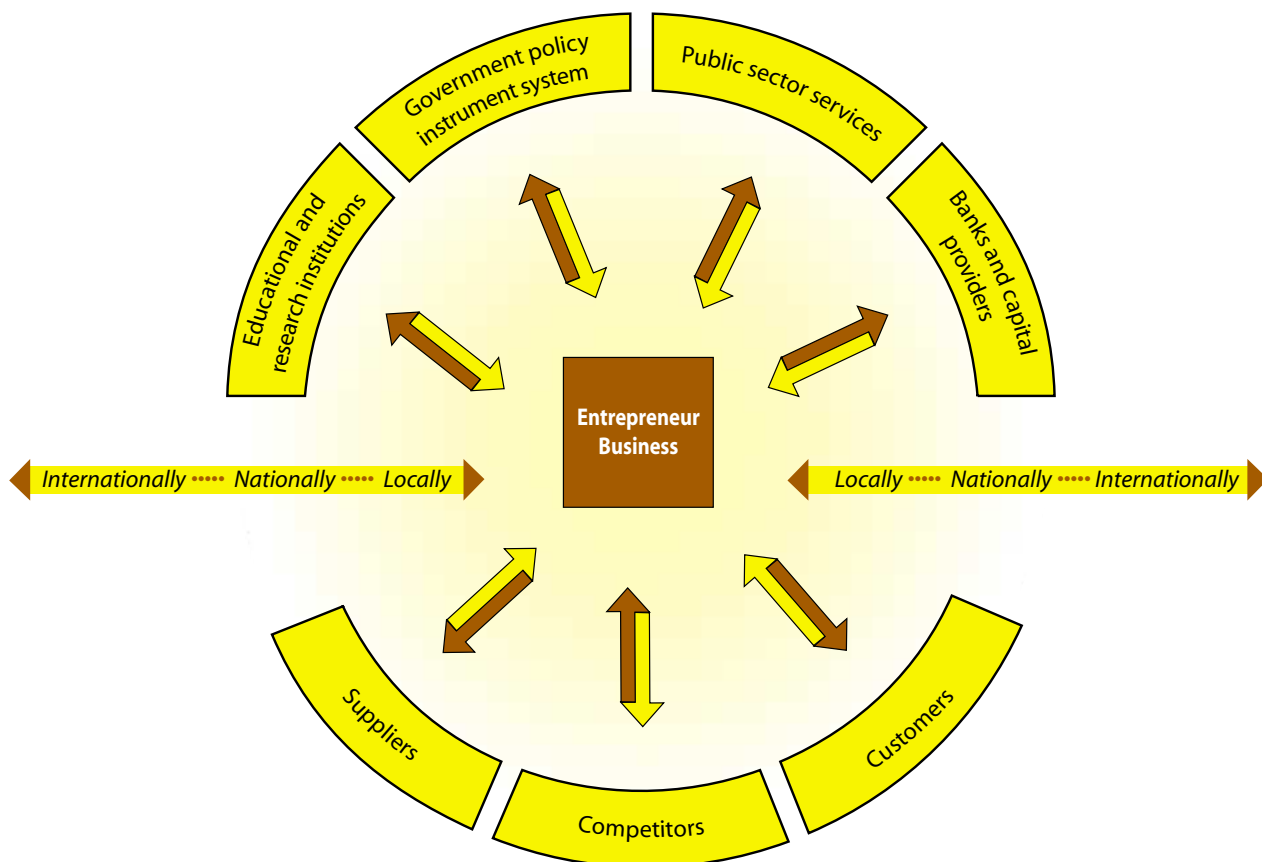


Diagram 3.1 Illustration showing the players within an innovation system.

Research and development is one important component of the innovation effort. Other important types of input into innovation activities are design, development of competency, marketing, and the procurement of external competency.

Many policy areas are of importance to innovation (see Diagram 3.2). Approaching these areas in context, by adopting a comprehensive perspective, will result in more effective policies. Efforts within different areas will then be prevented from counteracting each other, and may become mutually reinforcing. A comprehensive innovation policy addresses the framework for innovation, as represented by laws and regulations, tax policy, competition policy, labour market policy, and regional policy. Education and research policy is also important, because people, competency and creativity are of critical importance to the ability of business and industry to innovate. Infrastructure – both physical and electronic – is also of importance. There are, moreover, policy

instruments intended to directly stimulate innovation activity. In addition, it is important to have good coordination between the public and the private sector, and between regional and national administrative levels.

An effective policy requires relevant policy areas to work together, without the effects of different policies counteracting each other. One should avoid changes within different policy sectors resulting in conflicting incentives. Consequently, a comprehensive innovation policy must cut across sectors, and consider each individual change or measure in a broader context.

3.2 International comparison of innovation strategies

At present, innovation policy is the focus of considerable international attention. Several countries are in the process of developing innovation policy strategies (see Boxes 3.4 – 3.6).

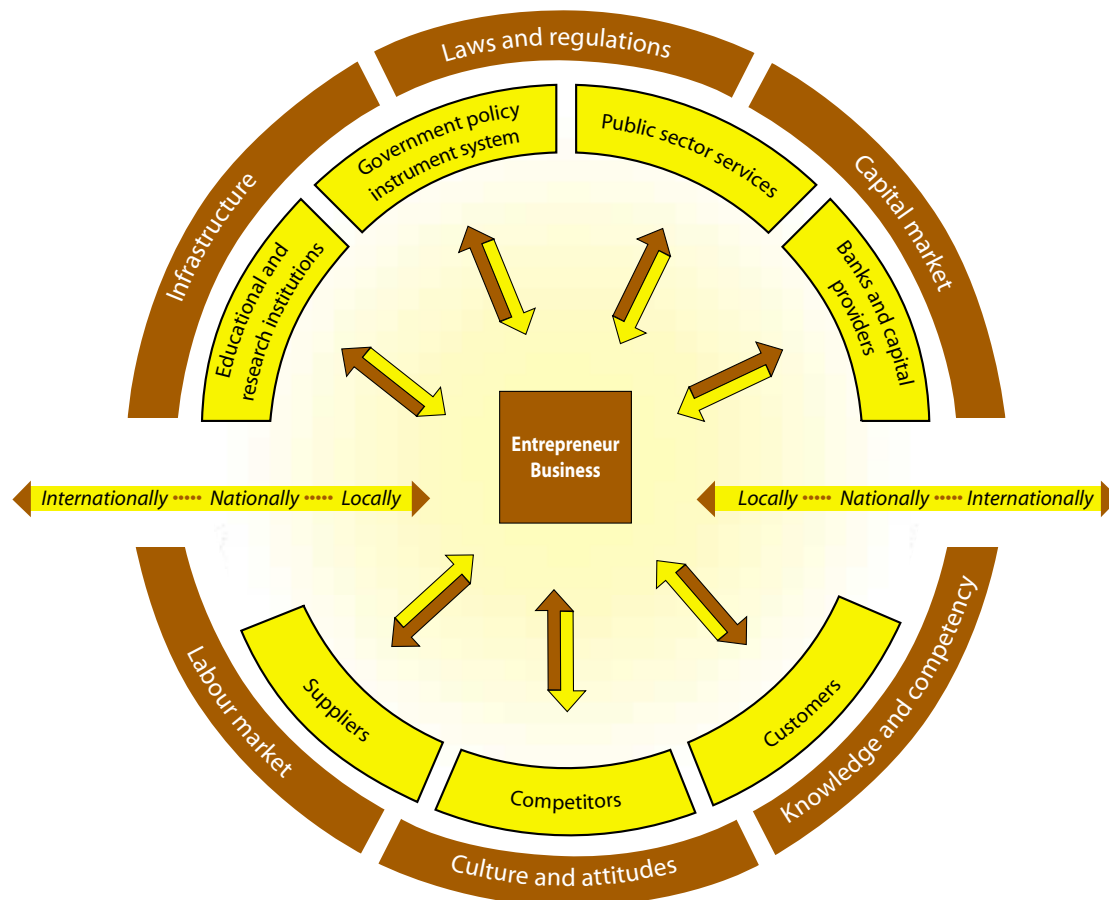


Diagram 3.2 Illustration showing policy areas affecting innovation activities.

International comparisons of the innovation strategies of various countries, and indicators measuring whether the defined objectives are met, put pressure on authorities to adopt the best policy. The Lisbon Strategy, the European Trend Chart for Innovation, the formation of the European

Research and Innovation Area (ERA), and the OECD surveys of National Innovation Systems are at the core of these efforts. The recommendations stemming from said efforts have attached particular importance to good policy coordination across different policy areas.

Box 3.4 Denmark's growth strategy

The Danish Government has launched "The Danish Growth Strategy", the objective of which is to provide the best possible foundation for business and production growth. The strategy cuts across many policy areas, and includes the spheres of 11 Ministries. Growth is to be strengthened through efforts in the education system, increased research and innovation, increased entrepreneurship, investments in infrastructure, and by ensuring free and open competition. See <http://www.oem.dk/> for additional details.

Box 3.5 Canada's innovation strategy

Canada has launched a comprehensive strategy for promoting innovation and to offer opportunities for all in a knowledge-based economy. The strategy sets out a number of national objectives and milestones for increased innovation, knowledge and competency. The objectives are related to increasing research efforts, improving the ability to commercialise, improving the framework facing trade and industry, strengthening local innovation capabilities, and increasing workforce knowledge and competency. See <http://www.innovationstrategy.gc.ca> for additional details.

Box 3.6 The EU Lisbon Strategy

The objective of the EU is to become the most competitive and dynamic knowledge-based economy in the world by 2010. It is intended that this will be achieved through sustainable economic growth, with more and better jobs and greater social cohesion. One has identified four main priorities in working towards such objective, including increasing employment and social cohesion, promoting innovation and entrepreneurship, strengthening the EU Internal Market, and protecting the environment. See <http://www.odin.dep.no/nhd> - "The EU Lisbon Strategy – The Norwegian Response" – for additional details.



4. The Government's comprehensive innovation policy

The Government's vision is for Norway to be one of the most innovative countries in the world, where resourceful and creative enterprises and people are given opportunities for developing profitable business. Norway shall be in the lead internationally in important areas, in terms of knowledge, technology and wealth creation.

The overarching objective of the Government's innovation policy is to facilitate increased wealth creation across the country – which wealth creation shall provide society with the resources needed to achieve overarching welfare policy objectives. Increased wealth creation requires increased innovation on the part of Norwegian industry. The Government has defined the following objectives to ensure this:

- Favourable and predictable conditions for trade and industry, offering a good overall foundation for innovation and wealth creation
- An outstanding system for learning and education, offering industry access to people with relevant knowledge of a high quality
- More research-based industry
- More new start-ups with a potential for growth
- An electronic and physical infrastructure promoting effective interaction between businesses, markets, knowledge centres and public authorities
- A new administrative practice that facilitates the development of an effective, dynamic and comprehensive innovation policy

These goals have guided the choice of areas that define the setting of the Government's policy:

1. General conditions for trade and industry
2. Knowledge and competency
3. Research, development and commercialisation
4. Entrepreneurship – starting up new businesses
5. Electronic and physical infrastructure

In practise, these five areas will interlock. The mutual influence said areas exercise on each other illustrates the importance of a comprehensive perspective in innovation policy.

Developing a comprehensive innovation policy is demanding, and is considered to be a pioneering effort, also in an international context. The presentation of this plan must thus be seen as a first step in the Government's work on developing and implementing such an innovation policy.

Implementation of a comprehensive policy requires new working styles. At present, different policy areas are managed more or less on a stand-alone basis at their respective political and administrative levels, based on their own objectives and values. There is today not sufficient scope for approaching the various areas as part of a larger context, and to take into account how these affect conditions for innovation and wealth creation. The Government has therefore decided to appoint a special Government Committee with development of a wide-ranging innovation policy – and coordination thereof across policy areas and Ministries – as its designated task. This new structure shall ensure

that the innovation policy agenda is pursued and prioritised.

Businesses and their innovation process partners are the focus of innovation policy. Problems within the Norwegian innovation system can only be resolved via cooperation and partnership between private and public sector players. The Government will therefore invite business representatives, and other key players within the innovation community, to regular contact meetings to improve cooperation between public authorities and private players for purposes of furthering policy design and implementation.

Large and established industries may exercise more influence on the organisation of policies and government policy instruments than does “unborn” industry. Start-ups and international relations must be integral to innovation policy design, and be at the core of the efforts pursued by the public policy instrument system, in order to avoid industrial sclerosis and a freezing of the existing industrial structure.

Innovation takes place at different geographical levels, and is influenced by the regulatory frameworks and policy instruments of regional, national and international authorities. A good dialogue between different administrative levels is important to the organisation of innovation policy,

not least in terms of mobilisation of regional advantages.

The elaboration and implementation of a comprehensive innovation policy must be founded on a solid knowledge base. More knowledge is needed, not least, on how to achieve an appropriate balance between the general regulatory framework and direct measures. One must, in addition to improving the professional grounding, make more use of evaluations, international benchmarking, international experience, and so-called foresight studies, in order to achieve necessary learning, elaboration and grounding of such policy. A more systematic bringing together of different types of knowledge bases will contribute to the creation of a shared understanding of national challenges and potential solutions.

The Government has already embarked on efforts within selected areas to ensure that a wide-ranging approach is adopted. These include, amongst others, work on modernising the public sector, coordination of research policy, marine wealth creation, a National Transportation Plan, and a national Agenda 21. The efforts pursued within these areas are closely related to, and reinforce, a comprehensive innovation policy. The Government will ensure broad collaboration between the relevant Government Committees, also in terms of sharing experience of new public administrative practice.

In order to achieve a new administrative practice that facilitates the development of an effective, dynamic and comprehensive innovation policy, the Government will:

- appoint a Government Committee for the development and coordination of policy design at the national level
- invite business representatives, and other key players within the innovation community, to regular contact meetings to improve cooperation between public authorities and private players for purposes of furthering policy design and implementation
- identifying organisational solutions that ensure improved coordination between public administration levels and sectors
- adopt performance measures within key areas of importance to innovation, and develop systems for policy design evaluation and learning, hereunder the development of indicators suited for assessing goal attainment.

The next five Chapters will explain in more detail the goals, statuses, and challenges within the five general areas of the plan. Taken together, these

constitute the basis on which the Government’s innovation policy is now being founded.



5. General conditions for trade and industry

The Government's objective:

Favourable and predictable conditions for trade and industry, offering a good overall foundation for innovation and wealth creation.

In order to achieve this, the Government will be promoting:

- Effective and efficient market competition
- A public procurement policy that stimulates increased business and industry innovation
- A tax system that ensures the effective use of society's resources
- More favourable conditions for the recruitment and use of manpower
- A user-friendly public sector as a competitive advantage of trade and industry located in Norway
- Regulations that require a minimum of business and industry resources to ensure compliance

5.1 Background

Fundamental economic conditions, like wage levels and Norwegian krone exchange rates, will impact on the cost-based competitiveness of our industry. It is important for such conditions to develop more or less in line with those of our trading partners, thus offering our industry good predictability and enabling them to make sufficient investment in, amongst other things, innovation, development and research. Stable conditions will also reduce the personal and financial risks involved in the development of existing and new ventures. Other

general conditions are also important in terms of the scope for enterprises to choose innovation as a strategy for increased competitiveness. Tax regulations, competition legislation, and regulations governing the access to, and use of, manpower, are all areas of legislation that should be organised so as to pave the way for effective resource allocation. This will also contribute to removing impediments to innovation.

5.2 Competition

Effective competition in a market contributes to the promotion of improvements and provides an incentive to invest in innovation activities. Effective competition may also contribute to swifter commercialisation of new and good ideas. However, there can be a trade-off between increased competition and incentives to invest in innovative ventures. In November 2001, the Government presented an action plan for a strengthened competition policy. The action plan comprises the following five main elements:

- strengthening the competition authorities
- reviewing government regulations and schemes that may act as impediments to competition
- ensuring that public procurement promotes competition and encourages new start-ups
- ensuring that public sector ownership is not practised in a manner that restricts competition and gives rise to monopolies
- ensure that public sector bodies are organised and operated in a manner that promotes competition.

The preparation of a new Competition Act is a key element in defining the role of the competition authorities. In April 2003, the Competition Law Committee submitted its proposal for a new Competition Act.⁴ The Committee recommends that the material provisions of Norwegian competition law be drafted, in the main, on the basis of the competition provisions of the EEA Agreement, hereunder the introduction of a general prohibition on colluding to restrict competition, and on the abuse of a dominant position. This will entail transformation from a combined prohibition and intervention regime, to a regime of outright prohibition. In Proposition No 6 of 2003-2004 to the Odelsting, the Government presents proposals for a new Competition Act and a new EEA Competition Act. The aim is for such new competition legislation to enter into force as from 1 May 2004.

5.3 Public procurement

The public sector as a whole represents a significant market, as such sector annually procures goods and services worth a total of about NOK 200 billion (2001). Public sector bodies are faced with the challenge of developing their role as professional and demanding customers. Specification of functionality requirements in

tender documents, and flexibility in terms of how such requirements are met, will probably result in more bids featuring new and innovative solutions. Furthermore, there is reason to believe that increasing the exposure of public services to competition will increase the rate of innovation within the services sector.

New government procurement regulations entered into force in June 2001. This implies that the regulations pertaining to central and local government procurement are the same, thus making it much simpler for individual businesses to act as suppliers to the public sector. Apart from that, the introduction of VAT on services has distorted competition in terms of public sector self-production versus the external procurement of services. The Government will therefore include, in the 2004 proposal on direct and indirect taxes, amendments placing local government and private suppliers on an equal footing.

The Government will, in line with the adopted action plan on public procurement and SME (2003-2004), consider several new measures designed to make it easier for suppliers to compete for public procurement contracts.

Box 5.1 Public Development Contracts (OFU)

The Public Development Contracts grant scheme stimulates businesses – through cooperation with a public body – to develop new products, services or systems. The objective of the scheme is to strengthen the competitiveness of participating businesses through collaboration with a demanding customer. The scheme has been administered by the Norwegian Industrial and Regional Development Fund (SND), and will as from 1 January 2004 fall under the auspices of the new government enterprise for innovation and internationalisation, as established by special statute (cf. Proposition No 51 (2002-2003) to the Storting; Policy instruments for innovative and creative industry).

5.4 Taxation

Generally speaking, most direct and indirect taxes will distort the prices of goods, services and other inputs, thus implying that the decisions of businesses are influenced in a manner that reduces society's wealth creation. The same applies when the tax system is used to stimulate innovation, e.g. by offering incentives to the pursuance of investments into R&D and creativity. There may nevertheless be good reason to stimulate increased R&D investment in certain contexts. Individual businesses will often make less R&D investments

than would be desirable from the perspective of economic profit, which may be caused by part of the return thereon accruing to other players.

When the importance of national borders is reduced, with businesses operating in global markets, it may be relevant to compare the national tax system with those practised in other countries. Differences in both tax rates and tax bases may influence where businesses make their investments and where they purchase goods and services. A heavy tax burden may result in businesses moving

4 NOU 2003:12 Green Paper: New Competition Act.

their operations, and the attendant competency, outside the country. In Norway this has been counteracted by a relatively low tax on capital. One has at the same time refrained, as a main rule, from using the tax system or regulatory framework as a policy instrument to attract special activities or investments.⁵

The present tax system favours investments in housing and other property over other types of investment, both through the taxation of income and the taxation of wealth. The Government has stated, in the Sem Declaration, that the wealth tax shall be scaled down, which will, when taken in isolation, contribute to a reduction of said distortion, and thus provide an incentive to invest more in productive assets. This will be addressed in the Government's follow-up of the NOU 2003:9 Green Paper from the Tax Reform Committee – Proposed Changes to the Tax System – which will be submitted to the Storting as a separate report.

5.5 The capital market

Innovation processes may be costly. A well-functioning capital market ensures the financing of good projects. The capital market comprises a number of different sub-markets. These include, amongst others, the stock market, the bond market, the commercial paper market, the derivatives market, and the loan market. The various sub-markets may be more or less organised, and the efficiency of the capital market depends on the efficiency of the various sub-markets.

The efficiency of the capital market is of importance to the efficiency of the ongoing resource use of the economy. Enterprises that are financed through shares, bonds or commercial paper are being assessed by their owners, lenders and potential new owners on a continuous basis. The stock market allows enterprises to be acquired, merged or de-merged, which may result in more effective deployment of existing capital. Furthermore, the efficiency of the capital market is of decisive importance to whether capital is allocated to those projects that offer the optimal risk-return profile.

The players involved in the capital market are governed by numerous laws and regulations. The

regulatory framework imposes requirements on, for example, how companies are organised, what activities different types of companies may pursue, how they must manage their capital, and how to deal with bankruptcy.

Regulation of the players involved in the capital market, of the marketplaces, and the supervision of compliance with such regulations, are important to the functioning of such market in terms of, amongst other things, access to capital. To the extent that Norwegian players are subject to different and/or more restrictive limitations than those applicable in other countries, that may affect innovative businesses' access to capital. The main aspects of the regulation of the capital market and the marketplaces are identical within the EEA Area, subject to some scope for local adaptations. Capital is a mobile input, and Norwegian enterprises and projects must, in principle, compete for access to capital alongside foreign ones. That is one of the basic tenets underpinning the single Internal Market, of which Norway forms part. It may nevertheless be pointed out that the choice of investment object is typically the result of a risk assessment performed under imperfect access to information. Local investors will have better access to information, not least information of a more informal nature, and will therefore assess the profitability of an investment in a different manner than will investors who do not possess such local knowledge. This contributes to investors being inclined to make the bulk of their investments in their home country.

Access to competent capital in an early stage is addressed specifically in Chapter 8 on Entrepreneurship.

5.6 Conditions for the recruitment and use of manpower

A well-functioning labour market, which does not unnecessarily hamper the occupational or geographical mobility of manpower, may contribute to increased innovation and desirable adaptation within business and industry. This is because manpower will be allocated to those uses where it will generate the highest return. This may again render possible the payment of higher wages.

5 For an overview of other countries' deployment of tax incentives, see Innovation Paper No 19, "Corporation Tax and Innovation: Issues at Stake and Review of European Union Experiences in the Nineties", European Commission.

Social security schemes, hereunder the design of pension systems, affects mobility between businesses, and not least between the public and private sectors. There is at present considerable mobility within the Norwegian labour market, but there is low mobility between the private and public sectors. The Government will in its future efforts promote the modification of schemes that restrict mobility between the private and public sectors.

The Working Environment Act, the Employment Act, and the Act on Mandatory Layoff Pay, etc., influence the functioning of the labour market and the ability of businesses to organise their own operations. This applies, for instance, to terms and procedures relating to recruitment, dismissal with notice, and summary dismissal. The Government has appointed a public committee (the Employment Law Committee), which is currently performing a review of the Working Environment Act and adjoining legislation relating to employment. A simplification of overtime provisions, and a right to contract out of employment protection provisions for senior executives who have been granted a contractual termination payment, have already been implemented. The Government will furthermore propose a softening of the current regulations on the scope for temporary recruitment.

Compared to employees, the self-employed have fewer social entitlements, which fact will influence individual choices about whether to become self-employed. This applies, as an example, to benefits related to having children, which may affect female self-employed in particular. As from 1 July 2003, the Government has therefore granted the self-employed the right to receive maternity benefits – calculated pursuant to the same provision as applies to sickness benefits.

5.7 User-friendly public services

Business and industry interact with public authorities in many contexts. The quality and efficiency of public services – in addition to government enforcement of laws and regulations – have a significant effect on the innovation and wealth creation conditions facing entrepreneurs

and businesses. The public sector shall therefore be seen as well organised and efficient, and it is an explicit objective of the Government that the Norwegian provision of public services shall be seen as a competitive advantage internationally.

A simple regulatory framework offering predictable and stable conditions for business and industry will promote entrepreneurship. The better the regulatory framework – and the implementation of governmental powers – the more time and energy can businesses allocate to production and development, and thereby to increased wealth creation. Simplification and adaptation to facilitate trade and industry is a priority of the Government. Such priority is reflected in, amongst other things, the “Modernisation Programme: User Orientation, Efficiency, and Simplification”. The action plan “Simplifying Norway” specifies, in this context, the Government’s ambitions for a well functioning regulatory framework, simplified reporting arrangements, and a public sector offering user-friendly services to business and industry. A status report including, amongst other things, new measures, will be presented in October 2003. The Government will, amongst other things, perform a review of legislation that may affect small and medium-sized businesses in an innovation perspective.

The Government has delegated responsibility and authority relating to the use of regional and rural development policy instruments to the regional administrative level.⁶ In managing such funds, regional administrations shall systematically collaborate with, and draw on, regional industry, policy instrument administrators, and educational institutions, amongst others. The motivation for such decentralisation is the need for increased regional freedom to adapt the application of policy instruments to regional challenges, thus giving rise to an active and differentiated innovation policy.

In order to simplify and strengthen business and industry’s contact with the user-oriented policy instrument system, amongst other things, the Government has decided to establish a new organisation for innovation and internationalisation

6 Cf. The Responsibility Reform, Proposition No 1 (2002-2003) to the Storting, Ministry of Local Government and Regional Development

based on the policy instruments currently administered by the Norwegian Industrial and Regional Development Fund (SND), the Norwegian Trade Council, the Norwegian Tourist Board, and the Norwegian Government Consultative Office for Investors (SVO). The resolved reorganisation of the user-oriented policy instrument system is also discussed in Chapter 8 on Entrepreneurship.

5.8 Reduction of administrative burdens

In a modern society of increasing complexity, there is a tendency for new areas to be made subject to regulations, with attending requirements as to reporting and documentation from businesses. It is the case, moreover, that most laws and regulations have been prepared with other primary objectives in mind than facilitating innovation, and may therefore have unintended and unfavourable effects on innovation. It is important for such effects to be taken into consideration when evaluating existing policies (regulations, reforms, measures, etc.) and developing new policies. The objective of the action plan “Simplifying Norway” is to contribute to reducing the administrative burden on business and industry. It is a general principle in the preparation of regulations, reporting systems and other administrative services that these shall be adapted to suit smaller businesses. It is important to assure the quality of regulatory design, to prevent the introduction of new regulations, or the amendment or adaptation of existing ones, from saddling all or part of business and industry with unnecessary financial or administrative burdens. Furthermore, it is important to develop attitudes and knowledge on the part of those responsible for the preparation of the various regulations. Last year, the Government established a group within the Ministry of Trade and Industry (§raket) charged with ensuring that the consequences to

business and industry of any government reforms, regulations and measures are taken into account at an early stage.

A modern society requires that the authorities to collect certain information from businesses and citizens, but this must be done in the simplest possible manner. The goals are for:

- government never to request more information than what is actually used
- businesses never to have to report the same information more than once
- government to offer the simplest possible method of reporting
- there to be a reasonable balance between government’s benefit from such reporting and the burden placed on the business in question

More coordinated information gathering and more reuse of information may reduce the reporting burdens on businesses. In addition, electronic forwarding of data will contribute to improving the quality of the reported data. Of special importance in this context is the AltInn project – a collaboration effort between the Brønnøysund Register Centre, the Norwegian Tax Administration, and Statistics Norway – for the electronic reporting and coordination of data from enterprises to government. The goal is to establish AltInn as a joint Internet-based solution for electronic reporting from enterprises, and to make it as simple as possible for each individual business to submit such information. AltInn will be available for reporting from enterprises from November 2003.

The regulatory framework pertaining to the setting up, transferring, and winding up of businesses is discussed in Chapter 8 on Entrepreneurship.

To ensure efficient and effective market competition, the Government will:

- submit a proposition to the Odelsting on a new Competition Act, with a view to such Act entering into force as from 1 May 2004.

As part of a public procurement policy that stimulates increased business and industry innovation, the Government will:

- follow up on the action plan on public procurement and SME (2003-2004), to make it easier for suppliers to compete for public procurement contracts
- implement amendments placing local government and private suppliers on an equal footing (cf. the 2004 proposal on direct and indirect taxes).

With a view to developing a tax system that ensures the effective use of society's resources, the Government will:

- follow up on the Green Paper from the Tax Reform Committee in the form of a separate report on tax to be submitted to the Storting.

In an effort to improve conditions for the recruitment and use of manpower, the Government will:

- promote increased mobility between the private and public sectors
- follow up on the report of the Employment Law Committee, which will be submitted in December 2003. The Government has already performed the following changes:
 - the self-employed have been granted the right to receive maternity benefits
 - the overtime provisions have been amended as far as concerns overtime restrictions over the course of one week as well as over the course of four consecutive weeks.
- propose a softening of the current regulations on the scope for temporary recruitment.

To increase the user-friendliness of the public sector, the Government will:

- continue work on the "Modernisation Programme: User Orientation, Efficiency, and Simplification"

The Government has already delegated responsibility and authority relating to the use of regional and rural development policy instruments to the regional administrative level.

To achieve a regulatory framework that requires the minimum possible amount of resources to ensure compliance, the Government will:

- present, during the autumn of 2003, a status report concerning work on "Simplifying Norway"
- perform a review of regulations that may impact on small and medium-sized businesses in an innovation perspective
- continue the development of S rakel, with a view to ensuring improved assessment of the consequences to enterprises of any government reforms, regulations and measures
- establish AltInn as a joint Internet-based solution for electronic reporting from businesses to government.



6. Knowledge and competency

The Government's objective:

An outstanding system for learning and education, offering industry access to people with relevant knowledge of a high quality.

In order to achieve this, the Government will:

- Develop educational institutions, from primary and secondary school to higher education, that generate and convey relevant knowledge of a high international standard.
- Strengthen competency within the sciences, and increase enrolment in these subjects.
- Strengthen lifelong learning and the ability of businesses to convert knowledge into creative practises.
- Promoting the exchange of knowledge between industry, on the one hand, and knowledge and competency centres, on the other hand, regionally, nationally, as well as internationally.

6.1 Background

Accelerated development of knowledge and technology, together with increased international competition, make knowledge and competency the prime inputs in terms of innovation, competitiveness and wealth creation. The ability to make use of knowledge and competency, and to combine these in new ways, is nowadays of decisive importance to any innovation process in any type of business. This imposes strict requirements, in terms of relevancy as well as quality, on the knowledge and competency accumulation taking place both within the formal

education system and within the business community.

6.2 Quality and relevancy of formal education

The education level in Norway has increased significantly, and is now high by international standards. A full 86 percent of the Norwegian population in the 25 – 64 year age bracket has upper secondary level education or higher, compared to an average of 64 percent for the OECD countries.⁷ This represents a competitive advantage on the part of Norway. However, some surveys indicate that the quality of Norwegian education is somewhat varied,⁸ showing, amongst other things, that the reading proficiency of Norwegian 15-year olds are no better than the OECD average. The same survey also indicates average mathematical and science proficiency (see Chart 6.1). Consequently, it is a key challenge to increase the quality of all Norwegian education, from primary school to research level.

However, it is not enough to have a highly educated population – a sufficient number must have an education that is relevant to business and industry needs. The OECD⁹ argues, in connection therewith, that further evolvement of education in Norway should focus on the capacity mix between different types of education, rather than on a further increase in the level of education.

The Government will improve the quality and relevancy of higher education and research

7 Cf. the OECD's Education at a glance, 2002.

8 OECD 2000: PISA.

9 OECD (2001): "Education Policy Review – Lifelong Learning in Norway".

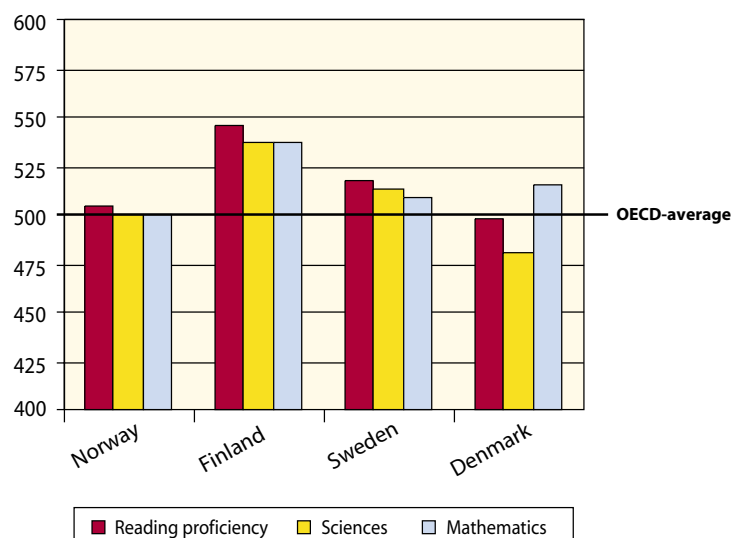


Chart 6.1 Reading, mathematics and science performance of the Nordic countries (PISA)

through the Quality Reform. As part of this, one is planning, amongst other things, closer follow-up of students, increased internationalisation of higher education, and improved interaction between educational institutions and the labour market. Moreover, educational institutions will be accorded more freedom and incentives to perform their duties based on regional and national challenges and needs. The Government has allocated more than NOK 1 billion to following up on the Reform. Its impact on national and regional innovation capability will be assessed during the planned evaluation of the Reform.

The Primary and Secondary Education Quality Committee submitted its main report (the NOU 2003:16 Green Paper, “In the front row”) in June 2003. In addition, the Committee submitted a sub-report in June 2002, with a special focus on quality assessment and development. The Government will in the spring of 2004 be submitting a Report to the Storting on quality and improved content in primary and lower secondary education. To improve the quality and throughput of research education, the Government will, in cooperation with the Research Council of Norway and the Norwegian Council for Higher Education, consider the establishment of so-called researcher schools.

In coming years, improving the conditions of

researchers will be given priority over the creation of new teaching and research positions.

6.3 Science competency

Science knowledge and competency is a key element of a high technology society. Marine and maritime industries, aluminium, oil and gas are important Norwegian industries that are in large part based on various forms of science competency. The development and exploitation of the wealth creation opportunities accorded by ICT is also dependent on access to science competency.

Despite the importance of the sciences, most Western countries are experiencing a noticeable shortfall in the number of students opting for the sciences, which shortfall is in many cases considerable (see Chart 6.2). There are several indications that this problem is particularly serious in Norway, both in terms of impaired science competency and a lack of motivation on the part of the young to choose education within these subjects.¹⁰ Surveys indicate average scores in mathematics and the sciences by international standards, as well as a deteriorating command of basic mathematical facts and skills amongst students embarking on studies requiring mathematical dexterity. Moreover, teachers at lower levels have little formal science competency compared to teachers in other countries, and the

10 The strategy “Sciences, naturally. Strategy for reinforcing the sciences 2002-2007”, Ministry of Education and Research, 2002.

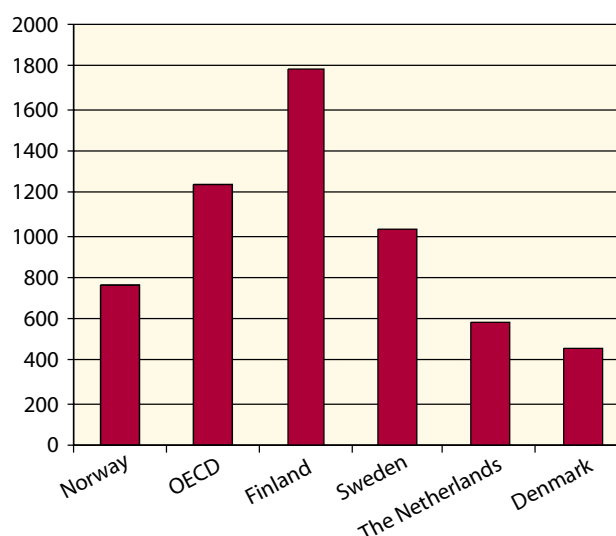


Chart 6.2 Number of science graduates per 100,000 members of the workforce in the 25-34 year age bracket

share of science graduates who become schoolteachers has fallen dramatically.

The Government has launched, against the above background, the strategy “Sciences, naturally. Strategy for reinforcing the sciences 2002-2007”, which strategy it will continue to pursue ahead. The strategy comprises descriptions of the status quo, proposals for a number of measures, and a plan for a more wide-ranging effort.

6.4 Lifelong learning

High innovation capability and adaptability requires a continuous supply of new competency, thus making it necessary to facilitate lifelong learning. Lifelong learning encompasses both formal education and informal education through work and other activities.

Lifelong learning requires learning and work to be closely integrated. An important element of the Competency Reform is the development of training schemes that exploit the possibilities offered by the workplace as an arena for learning. Good formal education programmes adapted to the needs of the labour market must be based on, and supplement, the learning already taking place internally and between businesses. An enhanced focus on supplementary and in-service training in a lifelong learning perspective, calls for, amongst other things, more flexible and user-adapted education, an expansion of tailor-made and module-based education, as well as of ICT-based distance education. Most of the framework of the Reform

has now been put in place. The Government has also, as part of the work on the Competency Reform, contributed part of the financing for the Competency Development Programme (KUP), charged with developing the market for supplementary and in-service training.

However, the formal education system is only one of several arenas for learning and the transmission of knowledge. Within businesses, much of the learning will be problem-oriented, and take place through continuous contact with users, customers and suppliers. The capacity of businesses to convert this type of knowledge into innovative practices is of critical importance to preserving their own competitive strengths.

The ability of businesses to establish, maintain and continuously improve their competency base is primarily the responsibility of businesses themselves, and depends, amongst other things, on their own qualifications and their ability to draw on external competency centres. As small businesses have fewer resources than large ones, small businesses may have a particular need of assistance from, and cooperation with, other players to stimulate their own strategic competency development. Both SND and the Research Council of Norway has established several programme activities that assist businesses in developing their own ability to undertake strategic competency development (see Box 6.1).

In addition, the Government has initiated the

Box 6.1 Examples of SND competency programmes

FRAM – Management and strategy development for enhanced competitive strength and profitability

Through strategy and management development, FRAM shall contribute to enhancing the long-term competitive strength, profitability, and renewal capacity of small and medium-sized businesses. FRAM is now a permanent fixture of the SND toolbox, and will in coming years focus on competency management, networking, and internationalisation.

The BIT Programme: Industry-oriented IT effort for efficient business practises

Through competency development, BIT shall contribute to more efficient use of IT within businesses, hereunder more efficient internal and external electronic business practises. The programme is based on a business-lead cooperation model, with SND contributing as a coordinator, a disseminator of experience, and in the form of tools/methodologies for implementation and quality assurance. The participants in the programme are small and medium-sized businesses, representing various industries and value chains.

As from 1 January 2004, the SND competency programmes will fall under the auspices of the new government enterprise for innovation and internationalisation, as established by special statute.

“Competency Report for Norway” project. The Report shall present competency as a driving force behind welfare and wealth creation in the wider sense. This encompasses, amongst other things, the development of new insight into how new and existing competency is made use of, and thereby contributes to innovation within businesses.

6.5 Interaction between industry and knowledge and competency institutions

New combinations and new uses of existing knowledge are of key importance to innovation. Good utilisation of the knowledge and competency available in regional, national, and international innovation systems requires close interaction between various players.

Many research and education institutions have also, in addition to national duties, a regional role, collaborating with regional industry and regional development players, with a view to develop, supply and disseminate relevant knowledge. Other regions have no such collaborative tradition, and have to develop user communities at a local level.

The 2002 amendments to the University and University College Act have accorded these institutions a greater responsibility for cooperation with the rest of society and working life, and for the increased application of scientific methods and findings within industries. Moreover, these institutions have been granted more freedom to

organise assignments and activities that are additional to the regular research and education duties of such institutions. One has for these purposes prepared a new regulatory framework, offering said institutions improved scope for establishing, and participating in, semi-autonomous research and education institutions, for collaboration with other public and private sector players, and for taking on external assignments.

Mobility is of key importance to the transmission of knowledge between various industries and sectors. Mobility is also important in terms of the interaction between academia and the business community. The latter is confirmed by the relatively strong correlation between previous industrial employment and subsequent research collaboration. The mobility between academia and the business community is relatively low in Norway, as compared to the other Nordic countries. It is therefore important to improve industry’s access to researchers. At the same time, industry has to improve its ability to make use of researchers and their competency. It is therefore important for industry’s exposure to various sources of knowledge to be linked to the most relevant national and international centres. Between 1991 and 2001, the share of foreign researchers in Norway has increased from 9 to 12.5 percent.¹¹ It will remain important to strengthen the international mobility of students, research workers, and industrial employees.

11 The Norwegian Institute for Studies in Research and Higher Education (NIFU) project report series no. 10/2003, “Inward researcher mobility to Norway”.

To develop educational institutions, from primary and secondary school to higher education, that generate and convey relevant knowledge of a high international standard, the Government will:

- ensure solid implementation of the Quality Reform
- submit, in the spring of 2004, a Report to the Storting on quality and improved content in primary and lower secondary education
- consider the establishment of so-called researcher schools.

To strengthen competency within the sciences, and increase enrolment in these subjects, the Government will:

- implement the presented science strategy, which includes, amongst other things:
 - developing an Internet-based supplementary science training programme
 - increasing science requirements for those applying for enrolment in science subjects at university level
 - offering teacher grants for supplementary and in-service mathematics training
 - evolving RENATE as a centre for science-oriented interaction with working life.

To enhance the exchange of knowledge between industry, on the one hand, and knowledge and competency centres, on the other hand, regionally, nationally, as well as internationally, the Government will:

- reward external activities through the new financing system for universities and university colleges
- continue the focus on programmes for the mobilisation of competency resources within small and medium-sized businesses under the auspices of the Research Council of Norway and the new unit for innovation and internationalisation
- present a "Competency Report for Norway"
- assess how to develop strong regional competency centres, and what role private and public sector players may take on in such a collaborative effort
- follow up on the new regulatory framework for semi-autonomous research and education ventures within the university and university college sector.



7. Research, development and commercialisation

The Government's objective:

More research-based industry.

In order to achieve this, the Government will:

- Aim to have Norway reach the OECD average for research effort by 2005
- Pursue the increased quality and internationalisation of Norwegian research
- Stimulate increased research and development on the part of industry
- Promote the commercialisation of research findings
- Stimulate improved interaction between knowledge institutions and business communities

7.1 Background

Research and development (R&D) are amongst the main sources of innovation and long-term growth.¹² Innovation may be in the form of radical innovations, generating new products and services, or gradual innovations that improve existing products and services. Research, development and commercialisation have an important role to play with regard to both forms of innovation. Consequently, an increased focus on R&D to

promote innovation must be accompanied by an increased focus on the commercialisation of research findings.

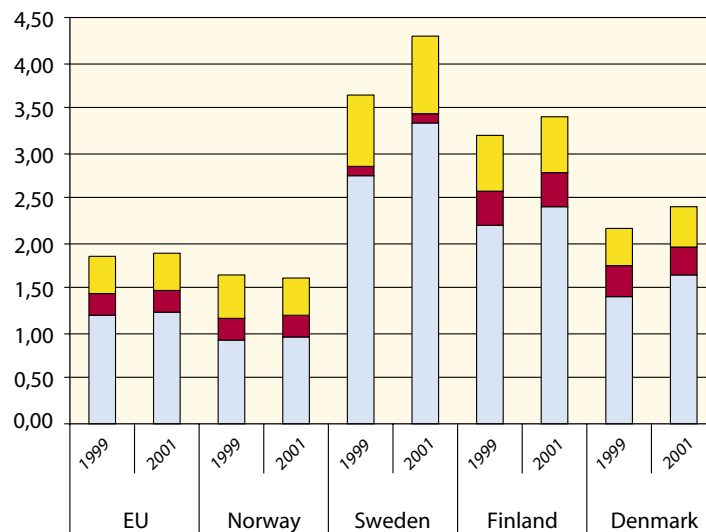
Research carried out in universities, university colleges, and research institutes has an important role to play in the development of present and future industries. Moreover, said institutions are important "importation channels" for knowledge and technology developed abroad. Businesses need closer interaction with research institutes, universities, and university colleges, both nationally and internationally, in order to access such knowledge.

Norway's R&D investment represents approximately 1.62 percent¹³ of GDP, of which industry accounts for some 51 percent, government for some 40 percent, and other/foreign interests for some 10 percent. Norwegian research and development investment, as a share of GDP as well as per capita, is the lowest in the Nordic region (see Chart 7.1). The EU aims to have Member Countries increase their research effort from the current 1.93 percent¹⁴ of GDP towards 3 percent of GDP by 2010. The EU aims for private industry to account for 2/3 of such investment.

12 OECD (2003): The sources of economic growth in OECD countries.

13 This figure refers to 2001. NIFU 2003.

14 This figure refers to 2000. Third European Report on Science & Technology Indicators, EU, 2003.



■ R&D expenditure attributed to the university and university college sector, as a share of GDP (%)
■ R&D expenditure attributed to the public sector, as a share of GDP (%)
■ R&D expenditure attributed to the business sector, as a share of GDP (%)

Chart 7.1 Private and public sector R&D expenditure as a share of GDP

7.2 Research

The journey from knowledge to innovation is often long and convoluted. Universities, university colleges, research institutes and hospitals are settings with time and resources to engage in research. Basic research and strategic research contribute to innovation in several ways. It happens directly through the commercialisation of research findings and ideas, and indirectly through industry's recruitment of graduates and researchers, through commissioned research, and through knowledge dissemination and competency development in collaboration with industry.

Professionally strong centres within both basic research and long-term strategic research are necessary prerequisites for international research collaboration, and for staying in touch with the international knowledge frontier. The fact that about 99 percent of all new knowledge and technology are developed outside the borders of Norway suggests that this is important. Moreover, underinvestment in research will contribute to Norway appearing less attractive in terms of the location of international R&D-intensive ventures. International evaluations show that there are several outstanding Norwegian specialist centres,

whilst quality is somewhat variable outside of such centres. Norway has a relatively high number of researchers relative to the size of its population, but Norwegian researchers achieve fewer international citations than do researchers in our neighbouring countries. Norwegian research centres have, nevertheless, achieved good results under the EU's Fifth Framework Programme for Research thus far.

The Norwegian research and education system is well developed throughout the country, with a good geographical spread in terms of universities and university colleges. However, the cities have an absolutely key role to play in the national innovation system. The main R&D and knowledge centres, such as universities and research institutes, are located in the cities, and these are also to a large extent the important "importation channels" for ideas from abroad. Apart from that, the towns point to the R&D activities of the regional university colleges as being of decisive importance to future development.

The Norwegian research institute sector is of considerable importance to research and innovation within Norwegian industry. Moreover, the research institute sector is large compared to

other countries, which is explained by the fact that it was developed to compensate for the Norwegian industrial structure, characterised by many small and medium-sized businesses with limited scope for undertaking own research. During 2005, the Government will submit a Report on research to the Storting, which Report will, amongst other things, review the research institute sector in terms of its size, structure, and role.

The Government has improved, through increased government research appropriations,¹⁵ conditions for knowledge- and research-based industry in Norway. The Government wishes to make additional contributions to more and better research in general, through the establishment of new Centres of Excellence, and through implementation of the escalation plan for post-graduate fellowships by the creation of 200 new fellowships in 2004.

7.3 Industry exploitation of, and investment in, research and development

Own R&D represents about half of industry's innovation costs. Research and development undertaken by businesses themselves contribute to the improvement of existing products and processes, and all give rise to new products, business areas, and businesses (spin-offs). Moreover, own R&D activity strengthens the competency of businesses, and their ability to absorb and make use of research and development taking place outside their business. However, there is a considerable difference between different industries in terms of their reliance on research and development. Research represents an important part of production within pharmaceutical industry, but is of less direct importance within parts of the services sector. Research and development may be of use within other industries than those that originated them. A good example is offered by the aquaculture industry, where research from the fields of IT and medicine has played a critical role.

On an overall basis, Norwegian businesses make limited research and development investment when compared to businesses in our neighbouring

countries. This may to some extent be explained by the Norwegian industrial structure, characterised by a higher proportion of industries that are not particularly research-intensive, as well as by small and medium-sized businesses commanding fewer R&D resources. However, a comparison of R&D investments shows that Norwegian businesses are not doing noticeably worse than foreign businesses within the same industry. Enterprises in the central part of southern Norway, as well as in Sør-Trøndelag, make the highest R&D investments. Enterprises in these areas also feature the highest proportion of enterprises that have traditionally engaged in some R&D activity, and which collaborate with research and competency centres. Northern Norway is a region where enterprises make relatively low R&D investments.

Norwegian industry in general have to increase their R&D efforts to safeguard innovation and long-term wealth creation. It is of special importance to get more small businesses to become R&D users, and to develop their own R&D competency. The Government wants to contribute to this through a continued focus on more effective deployment of existing policy instruments, as well as through measures aimed at reinforcing the interaction between industry, on the one hand, and educational and research institutions, on the other hand. With this in mind, the authorities are financing a number of relevant programmes and measures through the Research Council of Norway and through parts of the industry-oriented policy instrument system.

The new scheme offering tax credits for R&D projects, SkatteFUNN, is an important policy instrument for stimulating R&D within small and medium-sized businesses. The scheme is aimed at Norwegian industry in general, and supplements the more targeted programmes of the Research Council of Norway. For 2002, the Research Council of Norway approved 2,670 projects as qualified for tax credits or payouts in connection with the tax settlement. If these projects are implemented as planned, the businesses involved will be entitled to overall tax credits or payouts of about NOK 760 million. In 2003, SkatteFUNN has been expanded to larger businesses. Besides, the scheme has

15 NOK 1.6 billion increase for the years 2002 and 2003, and a proposed NOK 1.1 billion increase for 2004.

become better known, and businesses have had more time to prepare and pursue relevant R&D projects. One therefore expects considerable growth in the use of SkatteFUNN in 2003 and subsequent years.

The Government has completed a reorganisation of the Research Council of Norway. Its new Statutes state, amongst other things, that the Research Council shall promote innovation throughout Norway. The Research Council of Norway will, in connection therewith, strengthen its regional presence by locating designated employees in the district offices of the new innovation enterprise. In the first phase, one is planning such placements in seven regions.

7.4 Interaction between industry, on the one hand, and research and development institutions, on the other hand

Business interaction with research centres – in the form of collaboration, personal mobility, and networking – is of great importance to the promotion of industrial innovation. Whilst universities, university colleges, research institutes, and health enterprises play an important role in terms of research, development and the use of new knowledge, industry play an important role as collaboration partners and demanding customers as against the research centres. The quality and extent of such interaction is of great importance to Norwegian innovation capability.

There is a potential for increased cooperation between research centres and business and industry. Such cooperation may contribute to, amongst other things, an increased number of, as well as more relevant, research projects, more rapid absorption of research on the part of business and industry, as well as improved utilisation of research-based knowledge. The new regulatory framework for management of externally financed activities on the part of universities and university colleges may contribute to positive developments within this area. There are, in addition, special programme initiatives within the policy instrument system, hereunder the university college focus of the Research Council of Norway and the ARENA Programme of SND. Business and industry, on their part, must acquire a better understanding of the competency and the possibilities available through the research institutions. One should facilitate increased personal mobility between research and education institutions, on the one hand, and industry, on the other hand. In addition, various forms of collaboration projects and partnerships must be made more use of than is the case at present.

7.5 Commercialisation of research

Experience shows that only a limited number of new and patented ideas evolve into commercial successes. It is a particular challenge, in realising research-based innovations, to ensure the necessary commercialisation competency and market-orientation.

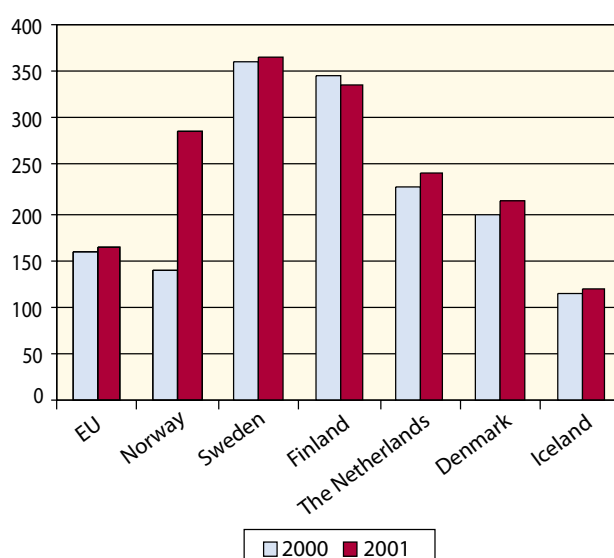


Chart 7.2 a. Number of patent applications per one million inhabitants (European Patent Office)

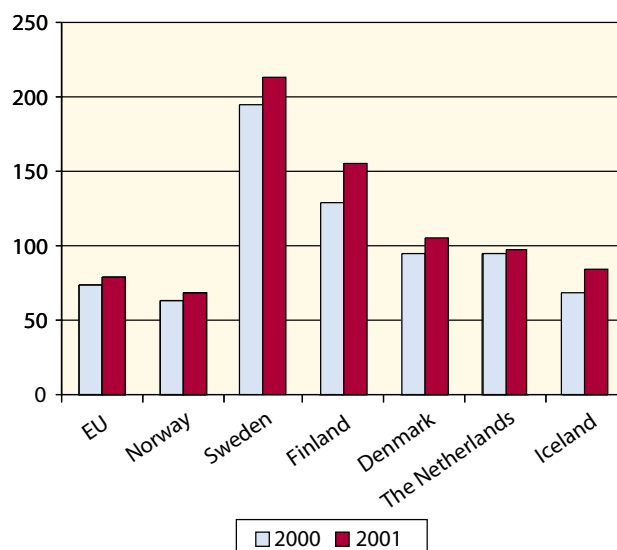


Chart 7.2 b. Number of patent applications per one million inhabitants (United States Patent Office)

Commercialisation requires extensive cooperation and an appropriate division of labour between private and public parties.

Patenting activity offers an indication of the scale and sources of creative efforts in Norway. Norway scores below average on most indicators – also in terms of applications filed abroad (Europe and the US) for patents within the area of high technology¹⁶ (see Charts 7.2a and 7.2b). During the period 1993-2000, Norway was at about the OECD average in terms of national patent applications per inhabitant, and the number increased by 16 percent from the 1993-1996 period until the 1997-2000 period. However, the overall number of patent applications in Norway increased by even more (22 percent) during the same period.

Intellectual property rights are accorded ever more importance in international agreements. Potential investors often consider intellectual property rights to be important “stamps of quality” for newly established technology-based enterprises, both because a patent is considered to be a “stamp of approval”, and because it ensures that said enterprise actually controls the technology on which its existence is based. For individual businesses, intellectual property rights will often be a necessary tool in ensuring access to capital in the early start-up stage, and, more generally, in realising a research-based creative effort. At present, small and medium-sized businesses in Norway are making little use of the potential

protection accorded by intellectual property rights. Two reasons for this are insufficient knowledge of the possibilities offered by the relevant regulatory framework, and the fact that it may be both complex and expensive to protect such rights. It is important for educational and research institutions, businesses, and public policy instrument administrators to cooperate on the dissemination of sufficient knowledge of intellectual property rights. The EU is considering the possibility of a joint European market-based research scheme, enabling the patentee to have his costs in relation to any litigation reimbursed.

In 2002, the Storting adopted the Government's proposed amendments to the University and University College Act, as well as to the Employee Invention Act. These amendments imply that universities and university colleges have, as from 2003, an expanded responsibility for the application of their own research and the commercialisation of patentable inventions made by the employees of the institution in question. The institutions must, in connection therewith, define their role in relation to existing policy instruments and players focused on research-based creative efforts. These amendments require new thinking on the part of both the institutions and their employees. Moreover, it is important for the public policy instruments for research-based creative efforts to be adapted to the present situation, with universities and university colleges as increasingly important players.

16 From “European Innovation Scoreboard 2002”

To contribute to Norway reaching the OECD average for research effort by 2005, the Government will:

- increase public research and development appropriations by NOK 1.1 billion in 2004.

To stimulate research and development on the part of business and industry, the Government will:

- evolve the SkatteFUNN scheme (estimated overall tax credits and payouts of about NOK 760 million for projects in 2002. A considerable expansion from this level is expected for projects in 2003 and subsequent years).

To increase the quality and internationalisation of Norwegian research, the Government will:

- strengthen efforts related to participation in the EU's Framework Programme for Research and Technological Development
- increase the number of post-graduate fellowships by 200 new fellowships in 2004
- offer new funds for Centres of Excellence in 2005.

To promote commercialisation and collaboration between knowledge institutions and business communities, the Government will:

- follow up on the amendments in the Act on Copyright to Ideas within the University and University College Sector, through, amongst other things, appropriations for the creation of five technology transmission offices (University of Oslo, University of Bergen, Norwegian University of Science and Technology, University of Tromsø, Agricultural University of Norway) and the FORNY programme for the commercialisation of research-based business idea (SND/Research Council of Norway)
- review public policy instruments aimed at the commercialisation of research
- consider the establishment of a special complaints commission for intellectual property rights.

In 2005, the Government will present a new report on research. One will, in connection therewith, perform a review of the research institute sector in terms of its size, structure, and role.



8. Entrepreneurship – starting up new businesses

The Government's objective:

More new start-ups with a potential for growth.

In order to achieve this, the Government will:

- Strengthen entrepreneurship training in schools and in higher education.
- Make it simpler to start up a new business in Norway.
- Target direct policy instruments at entrepreneurs, young businesses, as well as small and medium-sized businesses with a potential for growth.
- Contribute to improved risk management and access to capital in the early stage.

8.1 Background

New, innovative businesses represent an ever-increasing share of overall employment, innovation and wealth creation. In the last decade, various international surveys¹⁷ have shown a clear correlation between high start-up rates and wind-up rates, on the one hand, and productivity growth, on the other hand. In areas where the industrial community is relatively one-sided and offers limited opportunities, it is important for people to initiate their own businesses to exploit local and personal resources. Consequently, entrepreneurship is of key importance to ensuring adaptation, flexibility and innovation.

The Global Entrepreneurship Monitor (GEM) 2002 indicates high entrepreneurship activity in Norway. Between 20,000 and 25,000 new enterprises are

registered in Norway each year. 10 percent of these register two or more man-years in their first year, and less than half survive the first five years. 90 percent of them may be characterised as typical “livelihood enterprises”, whilst approximately 0.5 percent are new technology-based businesses focusing on export markets.

Women set up far fewer new enterprises than men do. When compared to other countries the difference would appear to be greater between men and women in Norway.¹⁸ One explanation, amongst others, may be insufficient motivation and willingness to assume risk, combined with the fact that social security schemes relating to childbirth are less generous to female entrepreneurs than to female employees. Moreover, both the start-up frequency and the growth of newly established enterprises vary by region, and are highest in urban areas.

Innovation often takes place at the fringes of entrenched core areas of industrial activities. A positive attitude on the part of existing businesses to employees testing new ideas, maybe within new businesses, may lend room for a considerable creative effort. Larger businesses often have resources that offer new products swifter market exposure and access than would normally be possible for start-ups.

Establishing a new business is demanding. In addition to the competency and attitudes of the entrepreneur herself, access to good advice, to

17 OECD Growth Project, OECD 2001.

18 Global Entrepreneurship Monitor (GEM) 2002.

networks, and to capital will be of critical importance to whether each individual entrepreneur or group of entrepreneurs will succeed. Moreover, it is important for it to be sufficiently simple, in purely administrative terms, to establish a new business.

8.2 Entrepreneurship in education

Entrepreneurship requires people with the right knowledge, skills, attitudes and ambitions. The skills include the ability to think in a new, creative and multidisciplinary manner. Competency in bringing new products or services to the marketplace is also important. Knowledge of entrepreneurship makes it simpler to establish new ventures, and increases the survival rate of start-ups. Entrepreneurship should be introduced at various levels within the educational system, to enable children and youth to develop entrepreneurial knowledge and skills already at an early age.

The realisation of new projects is often attended by considerable risk and uncertainty. Consequently, a

culture that rewards willingness to try out new things, and that appreciates the learning process involved in failing, is important to a country's creative effort. The ability of the educational system to disseminate knowledge of entrepreneurship processes is a prerequisite for the creation of a good entrepreneurship culture.

Teachers are important role models and mediators of knowledge to young people. A positive attitude to business, entrepreneurship, and wealth creation on the part of pupils is dependent on teachers having the requisite knowledge thereof. By changing the general teacher training plans, the Government has now accorded these elements a more visible role in teacher training. More arenas where the business community and schools can meet to enhance mutual knowledge of each other, and to dismantle cultural barriers, will improve both the quality and relevancy of education, as well as the long-term recruitment and competency development of business and industry.

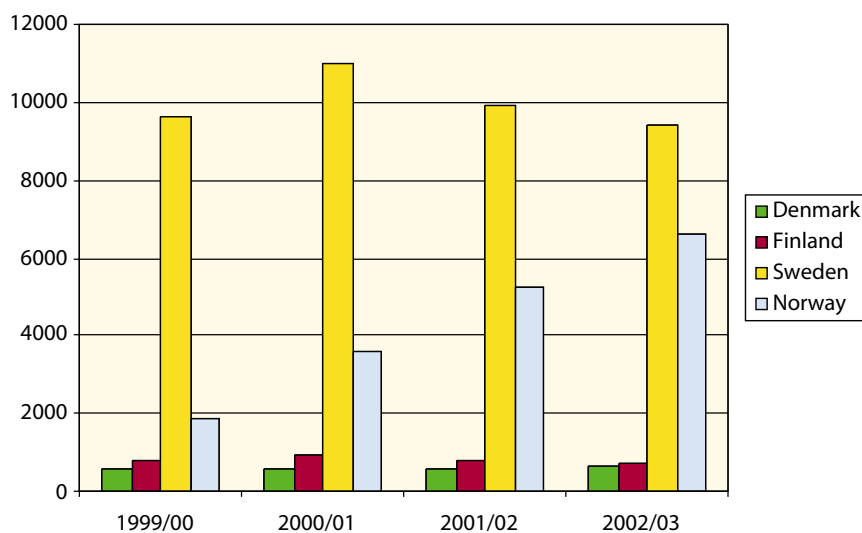


Chart 8.1 Number of pupils who have participated in Young Enterprises in upper secondary education.

Several organisations using different methods, from primary education to university level, are now pursuing important efforts and creating diversity within this area. Moreover, local and regional administrations, in their capacities of owners of primary, lower secondary and upper secondary schools, are important facilitators for entrepreneurship in education.

The Government will during the first quarter of 2004 present a national strategy for entrepreneurship in education. The strategy plan is being developed through cooperation between the Minister of Education and Research, the Minister of Local Government and Regional Development, and the Minister of Trade and Industry. The plan will address the entire education process from

primary school to university and university college level, as well as teacher training. Collaboration between schools and the business community will be a key issue in this context.

8.3 Simplifying starting up, transfer, and winding up

Setting up a venture should be seen to be as simple as possible, in order that government requirements and reporting duties do not have an unnecessarily demoralising effect on potential entrepreneurs. From May 2003 one has therefore permitted, as part of the Government's effort to make it simpler to set up a business in Norway, electronic registration of new enterprises of most organisational forms.

The probability of succeeding as an entrepreneur increases with the number of attempts made. Consequently, the regulatory framework design should not unnecessarily discourage entrepreneurs who have failed from starting up anew. Such concern must of course be balanced against other concerns, such as, amongst other things, the prevention of economic crimes. The Government will make use of lessons and conclusions from the EU projects "Restructuring, bankruptcy and a fresh start" and "Transfer of business" to assess the need for any amendments to the Norwegian regulatory framework.

8.4 Guidance, meeting places and networks

It can be difficult to establish the necessary contact with customers, suppliers, investors and competency centres in a country with a relatively dispersed settlement and localisation pattern, not least if said groups are located abroad. The public policy instrument system shall assume a facilitating role in regard to the setting up of meeting places, networks and infrastructure, and contribute to the development of innovation communities. The same applies to local and regional government, which partly implement their own measures and partly cooperate with national policy instrument administrators. There has, for example, been close cooperation between the Industrial Development Corporation of Norway (SIVA) and local/regional government on setting up, amongst other things, business parks and different forms of incubators.

Box 8.1 Examples of network programmes under the auspices of SND and the Research Council of Norway

The ARENA Programme under the auspices of SND (in collaboration with the Research Council and SIVA) shall develop regional innovation pilots. The purpose is to stimulate the development of regional innovation systems or "business clusters" in connection with knowledge centres. The Programme focuses on communication, interactive learning, and setting up meeting places for the participating parties. The collaboration is based on R&D projects.

The Wealth Creation 2010 Programme under the auspices of the Research Council – business development through broad participation – is a collaborative effort between the Research Council, the Norwegian Confederation of Trade Unions (LO), the Confederation of Norwegian Business and Industry (NHO) and SND – which started in 2001 and will remain in operation until 2010. The objective is increased wealth creation by businesses being stimulated to cooperate in terms of organisational development and creative efforts. This is achieved by using researchers as active facilitators. Learning and network building are at the core of the projects. The Programme supports regionally based projects.

The country's universities and university colleges have been given, through amendments to the Act on Copyright to Inventions Made by Employees¹⁹, greater responsibility for the commercialisation of their own research. This has resulted in more weight being attached to entrepreneurship also within such settings. The country's research parks and incubators should support the work now been carried out in universities and university colleges.

The Government aims for a simplified, better integrated, and more goal-oriented policy instrument system, and will therefore create, effective from yearend, a new enterprise for innovation and internationalisation, established by special statute and based on the policy instruments currently administered by SND, the Norwegian Trade Council, the Norwegian Tourist Board, and SVO (cf. Proposition No 51 (2002-2003) to the Storting; Policy instruments for innovative and creative industry). The new enterprise shall contribute to increased innovation throughout the country, and shall focus on entrepreneurs, young businesses, as well as small and medium-sized

19 Proposition No 67 (2001-2002) to the Odelsting, On Act on Amendments to the Act of 17 April 1970 No. 21 on Copyright to Inventions Made by Employees.

businesses with growth potential. Guidance, competency enhancement, and network building measures applicable to entrepreneurs are at the core of this new policy instrument enterprise.

In many cases, customers and markets that are both demanding and of sufficient size only exist outside the borders of Norway. This applies, in particular, to businesses based on niche products. Consequently, access to international networks and knowledge of foreign markets are important, and it would be inappropriate to separate innovation efforts from internationalisation efforts.

To simplify contact with the business-oriented policy instrument system, one will create a joint user-interface for all customers. This will comprise both a joint Internet-solution for all policy instruments, as well as a network of offices in Norway and abroad. All offices will offer information and competency on available business-oriented policy instruments.

8.5 Access to competent capital

Growth enterprises are often set up on the basis of a new product or service. The purpose of such enterprise is to develop said product or service with a view to market introduction and further growth. Such processes often depend on tapping into external sources of funds. New owners and/or new people in management may contribute, by way of capital, market knowledge and other expert

knowledge, to ensuring the further growth of the enterprise.

At the outset, the most common source of financing is the entrepreneur herself. Start-ups will often fail to meet the requirements imposed by banks for purposes of loan financing, for which reason such financing will typically be arranged in the form of a personal loan to the entrepreneur, who will then source the funds in question into the business as equity.

For the entrepreneur, the involvement of external investors means both less influence on the business and a reduced ownership stake in future profits. However, financing through external investors may have positive effects beyond the actual sourcing of capital, inasmuch as that the investor may also be able to contribute valuable competency and contact with its network. It is therefore important that one facilitates the creation of meeting places and networks – for example Business Angel Networks (BAN) – that may contribute to bringing together entrepreneurs and investors.

Venture capital firms will typically aim to maximise their return by investing in high-risk projects that might otherwise have experienced difficulties in obtaining financing, and will often focus on certain niches where they may contribute special competency. New capital has in recent years been

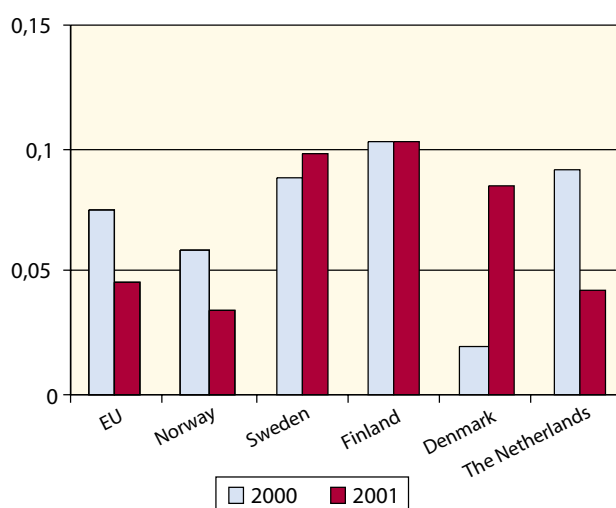


Chart 8.2 Early-stage venture capital investment as a share of GDP

made available in the market through various government-initiated schemes, such as the seed capital scheme and Argentum. These schemes are, in addition to making financing available, charged with strengthening and evolving the Norwegian venture industry.

The revised 2003 National Budget included

appropriations of NOK 400 million in the form of central government subordinated loans and NOK 100 million in the form of a loss fund for regional seed capital funds. Besides, the Government has proposed the creation of a new nationwide seed capital fund, backed by NOK 400 million in the form of a central government subordinated loan and NOK 100 million in the form of a loss fund.²⁰

To strengthen entrepreneurship training in schools and in higher education, the Government will:

- present, in the autumn of 2003, a national strategy for entrepreneurship education.

To make it simpler to start up a new business in Norway, the Government will:

- set up an Entrepreneurship Forum for dialogue between entrepreneurs and public authorities
- consider, in cooperation with industrial organisations, the formation of memoranda of understanding relating to mentoring for entrepreneurs in large Norwegian companies.

To target direct policy instruments at entrepreneurs, young businesses, as well as small and medium-sized businesses with a potential for growth, the Government will:

- establish, by special statute, a new enterprise with a joint user-interface, based on the policy instruments currently administered by SND, the Norwegian Trade Council, the Norwegian Tourist Board, and SVO.

To contribute to improved risk management and access to capital in the early stage, the Government will:

- set up four regional seed capital funds, backed by NOK 400 million in the form of central government subordinated loans and NOK 100 million in the form of a loss fund
- set up one nationwide seed capital fund, backed by NOK 400 million in the form of a central government subordinated loan and NOK 100 million in the form of a loss fund
- evaluate the current seed capital schemes, with a particular focus on their organisation and the general terms applicable to central government loans.



9. Infrastructure

The Government's objective:

An electronic and physical infrastructure promoting interaction between businesses, markets, knowledge centres and public authorities.

In order to achieve this, the Government will:

- Continue the development of an efficient, safe and environmentally friendly national transportation network that links the various regions to each other and ensures good international connections.
- Promote easy access to electronic signatures and good electronic payment solutions
- Facilitate effective competition in the construction of electronic communication networks, and in the development of services and content.

9.1 Background

An efficient infrastructure for the physical transportation of people and goods, and for electronic communication, is a fundamental prerequisite for innovation. The interaction and exchange of goods, services, and knowledge on which innovation processes are based, would not be possible without such infrastructure. A well-developed electronic infrastructure is an important driving force behind economic growth.²¹

Fast and cost-effective transport services for Norwegian export goods is of critical importance, given the long distances involved. Combining ICT

with physical infrastructure is important to achieve innovation within the logistics area. Increased use of electronic infrastructure (such as, for example, broadband) must be considered from the perspective of the design of physical infrastructure. Faster and more efficient information streams between suppliers, manufacturers, and customers necessitate new thinking within the logistics area, to ensure that more frequent and smaller deliveries do not lead to an increase in overall transportation needs.

Progress and efficiency improvements in terms of transportation infrastructure have over the last few decades offered peripheral regions increased opportunities and improved access to markets. Similarly, contemporary communications technology offers players in such regions improved scope for communicating with cooperation partners and competency centres throughout the world. Consequently, a good physical and electronic infrastructure is of considerable importance for regional development in Norway.

The importance of transportation to trade and industry, and the role of physical infrastructure in facilitating the operations of trade and industry, will be important themes in the report on the National Transportation Plan 2006-2015, which will be submitted to the Storting in the spring of 2004. The report will outline future transportation policy, and one will present a proposal for an investment programme prepared within the economic planning framework.

21 OECD Growth Project, OECD 2001

9.2 Electronic infrastructure

Electronic infrastructure includes, amongst other things, broadband, electronic signatures, and payment solutions. Efforts to improve electronic infrastructure require facilitation within all of the said areas.

Increased Internet use is attended by a need for security solutions that prevent misuse, for example in connection with the exchange of sensitive information or in connection with payment transactions. Individuals, businesses, and government bodies all have a need for secure exchange of data and dependable identification of communications partners. Development of a societal infrastructure for electronic ID and electronic signature, based on PKI (Public Key Infrastructure), will contribute to paving the ground for legally binding and extensive interaction over the Internet, thus opening up new opportunities for innovation and industrial development.

There is a need for cooperation between market players to enable interconnection between different electronic ID and signature solutions. In this regard it is important for the public sector to coordinate its electronic ID and signature requirements, in order to improve the scope for such infrastructure to be coordinated on the part of users. It is an important objective of eNorway 2005 for conditions to be prepared, within yearend 2005, for the general use of standard-based electronic signatures.

Development of electronic payment solutions will also offer scope for new electronic products. Traditional credit cards and direct transfers from bank accounts are currently costly due to onerous requirements in the form of safety procedures, user identification, and money laundering checks. A number of suppliers of, amongst other things, electronic content will depend on more modern payment solutions being capable of handling smaller amounts, through the creation of routines for the transfer of smaller amounts that are less elaborate than those applicable to other electronic transactions. Public sector coordination may contribute to creating the necessary critical mass for such simple solutions.

Broadband is a collective term for fixed and wireless telecommunication networks characterised by high transmission capacity, and represents the core of a future-oriented electronic infrastructure. The definition of what constitutes broadband depends on the needs in question. The Government's vision for broadband development is for the electronic infrastructure to cover all parts of the country, for it to constitute a competitive advantage on the part of Norwegian industry, for it to create growth opportunities for knowledge-based industries, and for it to contribute to the modernisation of the public sector. Private and public sector entities need good access to electronic infrastructure, and to be able to exploit the opportunities accorded by broadband. Content and services must be developed in line with market developments, and organisations and individuals must have the competency needed to realise the benefits available thereby.

Broadband enables simplification of communication with customers and suppliers, and makes it easier to automate processes. The use of broadband may also give rise to new and more efficient working methods within the public sector, as well as improved public services. Consequently, the capacity of the electronic communications infrastructure will play an ever-increasing role in terms of innovation, efficiency, wealth creation and environmentally effective solutions in society in general, as well as in trade and industry.

As per September 2002, 65% of businesses had the opportunity of opting for broadband.²² Coverage in the private market is expected to increase to about 85-90% towards 2005. Additional growth in the rate of coverage is uncertain, and is likely to take time. It depends, in particular, on technological developments, on the demand for broadband amongst those who have already been offered it, and on the development of attractive services and content. There is a close correlation between population density and broadband coverage. Coverage is the highest in areas inside, or in the proximity of, Oslo, Bergen and Stavanger, where competition is most intense and prices are lowest.

The overall situation in terms of broadband

22 ECON/Teleplan 2002, Report 92/02, Broadband Survey.

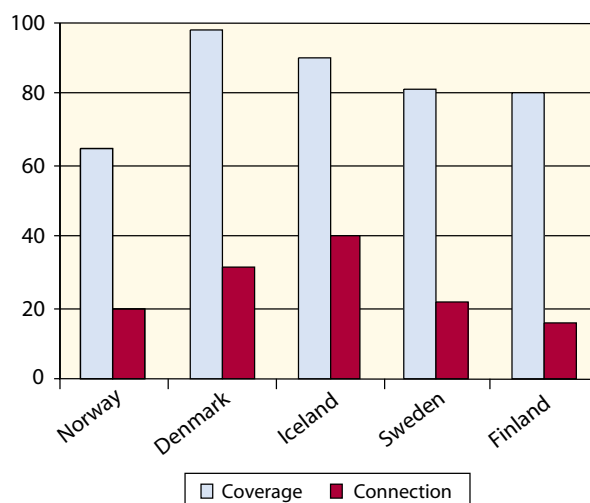


Chart 9.1 Expected percentage of broadband coverage and connection in the consumer market.

coverage (availability) at present, and the expansion expected towards 2005, seems reasonably good, although lack of coverage in some municipalities may result in less innovation activity in rural areas. The percentage of broadband users is still relatively low, but is growing rapidly. As per August 2003, about 16 percent of households and 15 percent of businesses were broadband users (see Chart 9.1).²³

The OECD has stated that Norwegian enterprises does not make sufficient use of technology to realise productivity gains.²⁴ It has also been questioned whether Norwegian businesses make sufficient use of solutions for electronic trade and commerce. Investments in a broadband network are not sufficient in themselves, as one must also create *services* to make use of the increased transmission capacity. The extent and quality of technology-related education in Norway may be a barrier to maximum exploitation of existing technology and infrastructure. Sufficient competency with regard to the opportunities offered by the new technologies, and the development of electronic content, is of decisive importance to the utility derived from broadband investments.

The Government has recently submitted Report No 49 (2002-2003) to the Storting, Broadband for Knowledge and Growth, in which one has opted for a market-based strategy for broadband expansion. Market players shall be responsible for the choice of technology and the construction of infrastructure for electronic communication, as well as appurtenant services. The authorities shall facilitate increased competition in the marketplace. One shall increase public sector demand for broadband, and facilitate services and content development, competency development, and the dissemination of experience. Moreover, the Government will consider measures targeted at areas where there is no commercial basis for expansion.

The HØYKOM Programme contributes to the realisation of broadband development targets, by supporting selected broadband projects within the public sector. The Programme has a considerable trigger effect and a good geographical spread, and has given rise to extensive cooperation both within the public sector and with private players. The Government has in the 2004 Fiscal Budget proposed an expansion, HØYKOM-district, aimed at broadband development in rural areas.

23 Norsk Telecom AS, August 2003.

24 OECD (2003), "Seizing the benefits of ICT in a Digital Economy".

To stimulate the continued development of an efficient, safe and environmentally friendly national transportation network, the Government will:

- present, in the spring of 2004, the overall transportation policy in the form of the National Transportation Plan.

To promote simpler access to electronic signatures and good electronic payment solutions, the Government will:

- facilitate cooperation between market players for purposes of ensuring interconnectivity between different solutions for electronic ID and signatures
- coordinate public sector requirements with regard to electronic ID and signatures
- promote the assessment of new electronic payment solutions as alternatives for public administration.

To facilitate effective competition in the construction of electronic communication networks, and in the development of services and content, the Government has:

- recently submitted a report on broadband to the Storting
- proposed an expansion of the HØYKOM Programme – labelled HØYKOM-district.