PROFILING AND ASSESSING THE NORWEGIAN INNOVATION POLICY SYSTEM

Contribution to the OECD MONIT project

Workpackage 1A

By

Svend Otto Remøe, Aris Kaloudis, Rannveig Røste, Finn Ørstavik og Siri Aanstad

STEP – Centre for innovation research

Oslo

9.1.2004

Draft, not to be quoted

Table of contents

Introduction

The MONIT project was endorsed by the TIP working party in December 2002. Building on the results of the TIP NIS project, its main objective is to generate knowledge on how to improve innovation policy governance and create a more coherent and comprehensive innovation policy. The focus is on how to achieve a more horizontal innovation policy through co-ordination with non-core policy areas, vertical integration and coherence, and new forms of governance and policy making processes. More specifically it studies the foundations for innovation policy governance by highlighting issues such as political leadership, building effective co-ordination mechanisms, socio-political foundations for information exchange and policy learning, cultural factors in policy systems and related sources for coherent policy making.

The MONIT project is organized in 3 work packages (WP):

- WP1 consists of a broad analysis and assessment of the national policy profiles and challenges, as well as of key governance issues;
- WP2 includes policy case studies in the areas of information society, sustainable development and transport, and regional policy;
- WP3 will synthesize the results from WP1 and WP2 and draw the policy implications.

STEP is in MONIT studying the Norwegian innovation policy system through several inter-linked studies. A main focus is to better understand the underlying logic of the Norwegian system, its roots in terms of cultural traditions and the main priorities coming out of it. Both mapping studies and more detailed studies of parts of the innovation policy system are therefore covered in the project.

The current paper is the contribution to the Norwegian WP1A, which sets out to present broadly based information on STI performance, policy challenges as perceived by key agents in the innovation policy system, overview of the current policy mix, as well as some crude indicators of horizontalisation in the policy system. The current version is a draft, basically descriptive, and will later be amended and integrated in a national report for Norway, including the rest of WP1 as well as lessons from the three case studies in WP2: Regional policy, policy for sustainable development and for the information society.

Performance of the STI system

The MONIT project is not aimed at benchmarking the performances, policies and institutional set-ups across countries. Rather, the aim is to provide such information and lessons on the individual countries so as to help generate learning both within and across participating countries.

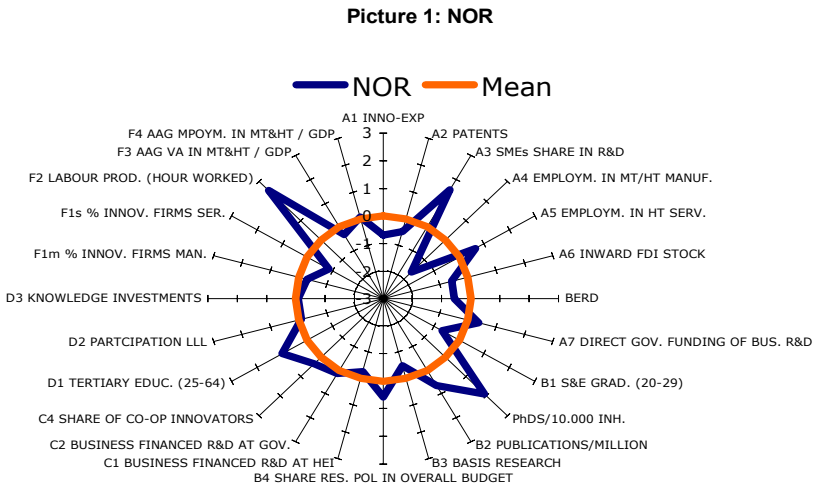
A key set of information has been reliable, comparable information on how each country performs on a set of science, technology and innovation indicators. To avoid unacceptable workloads, a dataset was chosen that included most countries as well as the main indicators relevant for the study. Hence, a recent EU study was chosen, and expanded with data on non-EU countries that were willing to provide information on those same indicators[1]. The statistical work has been done by the Dutch team for all involved countries. To better present

[1] "Benchmarking national research policies: The impact of RTD on competitiveness and employment (IRCE)", EU Commission, STRATA-ETAN Expert Group, 2002.

how each country scores relative to the others, without creating nation-specific patterns that were not comparable due to the scales, all data were normalised, and the performance for each country is illustrated on the backdrop of the "average others". Hence, the scales have no meaning in absolute terms.

The result for Norway is shown in figure 1 below. The (red) circle depicts the average of all countries involved, while the black, broken line illustrates how Norway scores relative to this average.

Fig 1: STI performance for Norway



The picture reveals an interesting, albeit somewhat contradictory message. Norway score relative high on labour productivity, although this must be seen in relation to the large GDP, a fact that also leads to lower GERD (Gross expenditures on R&D) than what would have been the case without the oil rent. More illuminating is the combined effect of high scores on tertiary education (without which knowledge investments (D3) would have been lower) and number of Ph.D.s. It illustrates well that Norway is an education society, with a great number of Ph.D.s in the overall economy. On the other hand, the production of graduates in science and engineering is very low, a recurrent theme in Norwegian debates. Taken together with the fact that BERD (Business expenditures on R&D) is low, it seems reasonable to argue that the significant knowledge investments in Norway create a well educated work force, but one which is not engaged significantly in business R&D.

Looking more closely at the innovation-related indicators (A1-7), patenting, employment in medium and high tech manufacturing, inward foreign direct investments and BERD are all low. On the other hand, the share of SMEs in R&D is high, as is employment in high tech services as well as direct government funding of business R&D. This would tell us that employment in high tech services are well developed, and telecom probably influences this. The other side of this coin is the relatively low share of innovative firms in services in general (F1s). The combination of low, innovation expenditures, low patenting, low FDI and low BERD is particularly worrisome, as it conveys a message about a low overall innovation activity and vitality in the Norwegian economy.

The combination of relatively acceptable scores on C2 and C3 should be seen together with A7 to confirm a picture consistent with Norwegian R&D policy to have been greatly focused on direct support in a way that includes incentives for collaboration with research institutes and universities. This is also linked to low levels of basic research, leading to a conclusion that public investments in knowledge are skewed towards higher education and applied, business oriented support, while basic research and graduations in science and engineering suffer.

It should be noted that these data are from 2000, before the introduction of tax incentives for R&D in 2002-2003 (see separate section). Still, the picture being presented in this graph should lead Norwegian policy makers to re-examine some of the emerging biases. While government activity is acceptable on several areas, areas to be rectified are in particular those that seem to be linked to low levels of capability and attractiveness of Norwegian firms, most notably employment and activity in business with higher levels of R&D (medium and high tech), production of science and engineering graduates, foreign direct investment, and innovation and R&D activity in the economy in general.

Perceived policy challenges and policy mix

In this section, we map the *central challenges* in Norwegian innovation policies as they are perceived by actors in the policy system, as well as the *current policy mix* – that is the set of established priority areas and actual policy efforts within the field of innovation policies. The mapping is done against the background of an actor oriented picture of the national innovation system (NIS), as shown in figure 2.

By comparing the information of central challenges and current policy mix, we assess the degree of correlation between perceived problems and actual efforts in today's Norwegian innovation policies. Although one may expect a considerable degree of overlap between the pictures, this is not necessarily the case. It is expected that factors such as lack of attention, lack of capabilities for experimentation, and inertia leading to politically untouchable areas are typically part of the policy system and should hence lead to significant gaps.

Perceived policy challenges

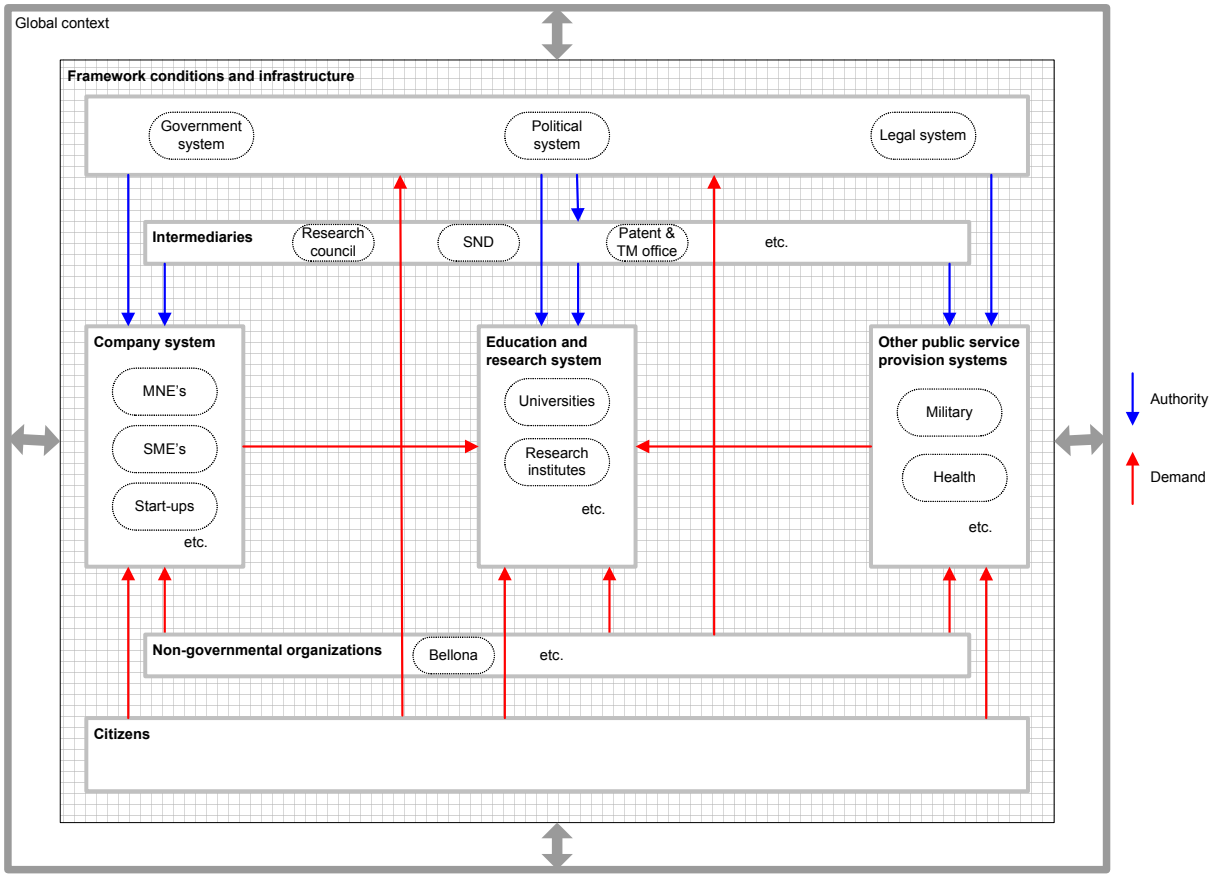
A methodological note

Our mapping of perceived challenges in Norwegian innovation policies is based on two data sources: 1) a survey carried out among actors in the policy system, as well as 2) an analysis of relevant policy documents. Altough not providing a complete picture, the mapping exercise gives an overview of what is perceived to be the central challenges by both individuals and organizations across a wide spectrum of the innovation policy system.

Survey

In November 2003, a questionnaire was distributed to a total of xx persons who work in organizations[2] that are involved in the development and implementation of innovation policies in Norway (results from this will be integrated in the next version).

Figure 2. An actor oriented picture of the national innovation system (NIS)



Policy document analysis

In addition to the survey, we have chosen to build our analysis on primary material which is eminently suited to our purpose. A significant collection of documents has been available to us in which key actors in the innovation policy system detail what they see as key challenges in the innovation policy system, what role their own institutions plays, and should play, and how specific issues concerning their own operations ought to be addressed. The documents are a response to the Ministry of Trade and Industry's call for contributions to and opinions

[2] covering the Ministries of Trade and Industry; Education and Research; Local Government and Regional Development; Finance; Labour and Government Administration; Fisheries; Agriculture; the Research Council of Norway (NFR), the Norwegian Industrial and Regional Developments fund (SND), the Industrial Development Corporation of Norway (SIVA), and the Norwegian Trade Council. It should be noted that the SND and the Trade Council on 1.1.2004 merged with the Norwegian Tourism Council and the Norwegian Government Consultative Office for Inventors.

on an overall revamping of the innovation policy system in Norway.[3] The following analysis is primarily based on a content analysis of this collection of documents.

Challenges

The various statements submitted to the Ministry of Trade and Industry are very different in both scope, length, as well as in the generality of the perspectives. Small institutions with particular missions address narrow issues, while the larger organisations such as the Norwegian Research Council (NRC) and State's Industry and Development Fund (SND) chose to submit voluminous reports addressing the broad issues concerning not only their own activities, but the overall structure and function of the Norwegian system of research and innovation.

Here, we relate the central challenges that are highlighted in these statements to our map of the innovation system presented above, and we discuss these in the subsequent sections under the headings:

- General challenges
- Performance of the governance system
- Performance of the R&D and education system
- Performance of the company system
- Non-governmental organizations
- Citizens

We are not able to pay attention to specific issues concerning actors and opinions, to what extent opinions are shared or contested, what actors hold what positions, etc. In general, we portray the key issues that seem generally to be focussed in the debate, and that are generally considered relevant and important.

General challenges

Framework conditions and infrastructure

Judging from the documents we have reviewed, there is a rather broad agreement that the general conditions for pursuing innovative business ventures are relatively poor in Norway. Macro-economic policy is one concern. There is a need for restricting the use of oil revenues in order to curb inflation and in order to keep interest rates low. Contrasting the need for fiscal restraint, there is a broad concern about tax policies. Seen in isolation, tax levels are too high, and this, many believe, creates competitive disadvantages for Norwegian firms and hinders innovation and industrial growth.

Liberalization of trade and globalisation trends represents formidable challenges for many firms and industries in Norway. The challenge concerns new competitive pressures at home, but obviously also the successful migration of business activities to foreign markets.

Are the policy institutions, the R&D and education system, and the company system, able to cope? What should be done to strengthen actors in these systems so that they may prevail in the times ahead? Such questions are asked by many in the innovation policy system, and

[3] The documents are referenced at the end of this document. At the time of writing, the documents are available at the internet address http://www.odin.dep.no/nhd/norsk/p30000694/p30003208/024091-990021/index-dok000-b-f-a.html.

proposals are made for changes that will effect most of the subsystems and the interfaces in the innovation system. Collaboration, alliances, legal and institutional reform are among the issues most frequently mentioned.

The need for strengthening infrastructure for transport of people, goods and information is pointed out, and is seen as intimately related to the above issues. In a similar vein, the need for strengthening infrastructure for regional development is also emphasised. In order to create opportunities for innovation, business development and industrial growth around the country, there is a need to improve transport infrastructure, and to gear investments to the needs of innovation systems, rather than to focus on equal access to infrastructure of comparable quality in peripheral areas.

Broadband development and telecommunications infrastructure seems not to be of very great concern today. The privatisation of the public telecommunications systems is a thing of the past. Today, only one significant issue seems to be on the agenda: What should be the role of government with respect to promoting the development of broadband "information highways"? Should this be a sole concern of the private telecommunication companies, or ought the state play a leading role? How should this in case be done?

An insufficient level of spending on R&D and innovation
The concern with R&D and innovation spending is a continuing theme in the innovation policy debate, from top to bottom in the innovation policy system. Nearly everyone seems to be in agreement that the low level of investment is a bad thing, and there is considerable debate concerning what ought to be done about this.

An ideological and professional dividing line demarcates two approaches to the issue. The dominating paradigm for dealing with the issue is economic, and addresses the problem with an economic vocabulary where terms such as market imperfections and additionality are key concepts. A core issue for proponents of this line of thinking is what is called "crowding out". The question is: Do public activities, in spite of all good intentions, in effect replace private activities which would have been able to emerge if it weren't for the public activities going on already? Is there a crowding out of what could be normal economic activities, when government establishes itself in functions and roles that could just as well be filled by private firms?

On the other hand, there is a line of more systems oriented thinking which focus on systems failures (or bottlenecks) and which has a more pragmatic and evolutionary approach to innovation policy issues.

The two strands of thinking do not only lead to conflicting policy implications. All agree that there is a need to create incentives that help fostering research in industry, and more collaboration between researchers and people in industry. However, there is disagreement on the need for and the usefulness of direct measures targeting specific industries, technologies or firms. It appears that the systems perspective today increasingly is entering the scene in the policy system as a theoretically well grounded alternative to neo-classical economic arguments.

Systemic flaws
To what extent concrete systems mappings and bottleneck analysis can deliver what policy makers need, cannot yet be fully established. The fact remains, however, that the systems

perspective has entered decisively into the Norwegian innovation policy debate. There is broad concern with the structure and function of the innovation system. In particular, there is focus on the key interfaces, and on the volume and quality of links between agents within and across subsystems. Issues that are raised in the debate concern, for example, the ability and willingness of people in business and academia to establish collaboration and alliances. Also, there is a concern with the ability of government institutions to collaborate strategically with actors in the company system. Further, there is concern with how much and how well different institutions in government are able to collaborate. Beyond this, there is, as mentioned earlier, very much concern with the ability of Norwegian firms and institutions to enter into collaborations and alliances internationally.

Performance of the governance system

The disagreements referred to above influence the policy debate to a great extent. Some feel a great need for bridging the gap, or at least for establishing a theoretical framework that could make it possible to establish a more solid scientific rationale for more direct and hands on policy action. In this perspective, and in line with the dictum that nothing is as practical as a good theory, some of the participants in the innovation policy debate are convinced that the performance of the policy system could be greatly improved, if only a better and more coherent theoretical rationale for policy action could be established. In reality, the large scale and ambitious reorganisation of the RCN as well as the SND (now part of Innovation Norway), build on opinions about what is necessary and important, for example with respect to needs for basic and applied research, that are not at all well grounded in theory and knowledge.

The systems oriented and the neo-classical economics oriented approaches do not always contradict each other, but they seem to lay the ground for distinct initiatives with respect to policy action. In general, economists play a very important role when analyses are concluded. There is, thus, a very strong tendency to see the introduction of market based and for-profit interactions (privatisation) as a necessary means to achieve greater effectiveness and efficiency in most areas of activity. In part, institutions are transformed by changing the framework conditions within which they operate. Not seldom, this transformation amounts to moving an agency from the Government sphere into the Company system. Less drastically, the activities of centrally placed bureaucratic structures are transformed by dividing them into smaller units, placing each unit in different regions, in effect, it is claimed, “moving the agencies closer to their customers”.

Finally, there is a current concern today with the overall structure of the government system, the coherence of decisions and actions, as well as the timeliness and rationality of decision processes. This concern is voiced by key players, not least in the ministries and at the level of Government Ministers. (The financing of MONIT project activities in Norway is a result of such concerns.)

Performance of the R&D and education system

In the innovation policy debate, there is a concern with both the quality and volume of research being undertaken, as well as a concern with the way the investments actually being done in these areas pay off with respect to commercially successful innovation. Results depend on the performance of the company system, a fact we will return to in the next section.

The quality of disciplinary research has been a concern for a long time. Norwegian researchers do not publish sufficiently in academic journals, and many are preoccupied with why this is so, and what can be done about it. As will be pointed out later, the current government has embarked on a program of concrete policy action to promote higher quality in university level research. The task is ideologically problematic, as the principles of academic autonomy and individual freedom for academics are potent rhetorical weapons against conventional approaches to management reform and organisational streamlining.

Another issue which is considered very important is the issue of size and structure of the public and semi-public research institute sector. Over the years, the institutes have increasingly been moved away from the system of government and public services towards the company system. Institutes have gradually had to deal with economic competition, in addition to the academic competition faced by institute researchers aiming at scientific publication. The institute sector is still large, public financing of the sector significant, and it is a key issue to decide on the future development path of this sector.

It appears unavoidable that further debate on this raises fundamental questions about roles, relationships and missions of the research institutes seen as elements in the larger innovation system. So far, little has been said about this.

The relationship between business and academia is a key concern, and many are critical to the ability of academic researchers and research institutions to relate meaningfully to firms, business activities and real life innovation processes. Academics are seen as being located too far away from milieus where commercial applications are being developed. This is not least seen as a cultural issue, but also as a clear result of institutional and individual incentive structures.

Performance of the company system

The debate may be critical to the actual contribution of academic researchers to innovation processes, but it is no less preoccupied with the ability and willingness for firms to connect to advanced research in order to exploit the fruits of this effort. The industrial structure of Norway is considered to be a problem, in two ways: There are too many small firms in which the absorptive capacity with respect to science and research results tends to be very low. At the same time, the industrial structure of Norway has a bias in the direction of process oriented activities around exploiting raw materials and cheap energy. Not enough business activities are knowledge based, and more should be done, it is claimed, in order to develop such knowledge based industry in Norway.

The debate on performance of the company system does not seem at present to pay much attention to corporate governance. This relates to the fact that there is broad political agreement (in the policy system) to reduce the role of state ownership in commercial activities. This is a general view relating to the overall layout of the Norwegian innovation system, but it is also an issue which is seen as touching upon the company system in particular.

In general, framework conditions are considered essential. The push for privatisation in the sense of reducing state ownership, and in the sense of moving public agencies and services

towards the Company system (corresponding to new approaches to public management), is very important today, at least in the political rhetoric.

Some steps are taken to improve innovation effectiveness for private firms, as well as the competitive environment. The debate on the need for a tax incentive scheme for allocation of resources to R&D, a scheme which has recently been implemented, is a sign of this. Taxation overhaul which would improve profitability of firms is argued to be another effective means for promoting the establishment of new firms and to promote a entrepreneurial spirit among citizens in Norway.

But several of the ideas and opinions on why the Norwegian company system is underperforming with respect to research and innovation run counter to this. Some of the themes brought up are the following: What can be done to counter the almost total lack of private venture capital which new firms experience today? What can be done to stimulate collaboration and networking between firms, and between firms and other institutions, inside Norway as well as internationally?

Non-governmental organisations

NGO's are critical elements in the innovation system, as they gather and focus popular demand for renewal both in commercial and non-commercial operations. It is an interesting fact that NGO's are not mentioned in the innovation policy debate that we have analysed.

Citizens

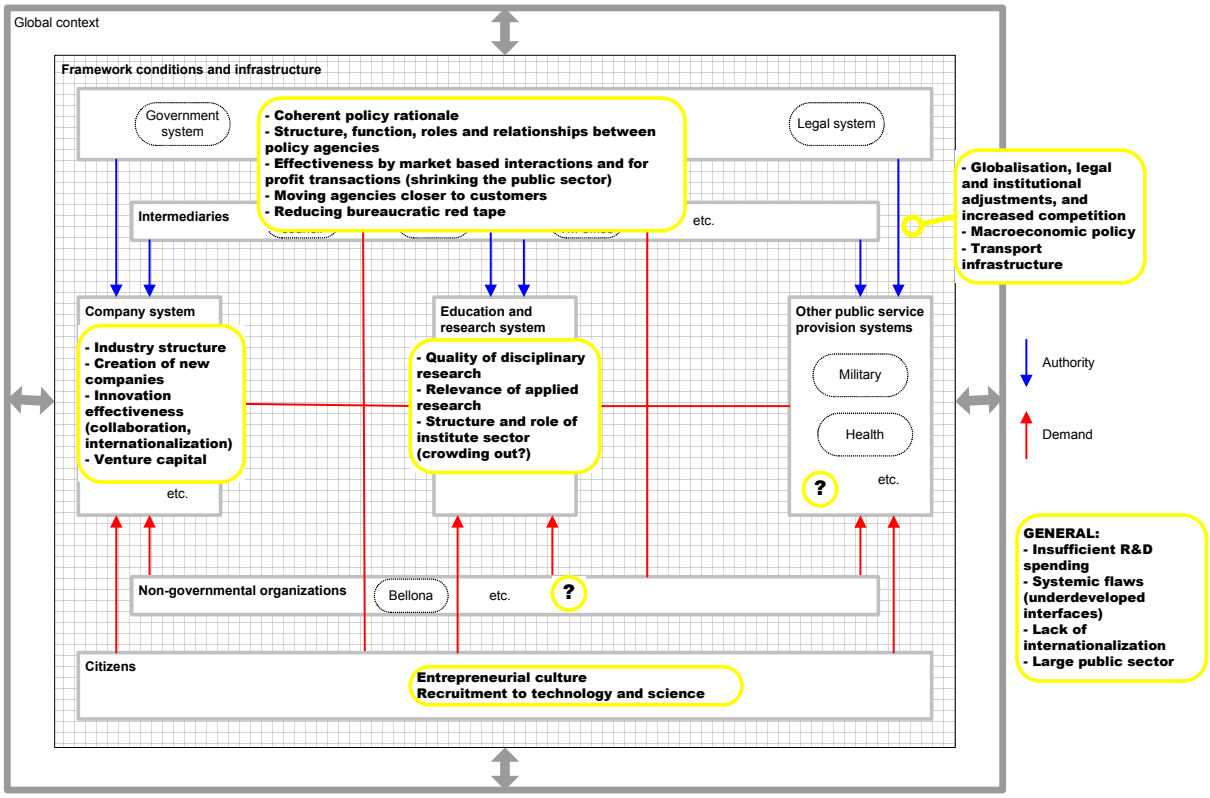
Citizens are focused on in two ways in the debate. First, by pointing out that a culture for entrepreneurship must take root in the population as a whole. Interest for and commitment to industrial renewal may well be seen as a cultural trait, and the role of the education system and other opinion formers in promoting such a culture is called for.

Secondly, citizens are seen as the most basic and essential of resources for innovation efforts, and the need to recruit and motivate the young to embark on studies and careers that are key to technological and other innovation efforts, are emphasised.

The overall picture

A graphical representation of what we have found is presented below. In sum, the perceived challenges include some of the usual suspects, like low R&D funding, an industry structure not conducive to future needs of the economy, lack of venture capital and lack of entrepreneurship (start up of new firms with growth potential). However, beyond these there are several interesting issues coming up. In particular, we would like to highlight the focus on a lack of coherent policy rationale and the overall governance of the innovation policy area. This also leads to an awareness of the problems linked to the macro-economic policy, and implicitly the dominance it takes in the Norwegian policy environment. Notable are also transport and infrastructure as well as issues linked to globalisation and international competitiveness. Lastly, we note a clear awareness of weaknesses in the core education and research system, including basic research and the role of the research institutes in the innovation system.

Figure 3. A summary of perceived challenges



Policy mix

By policy mix, we understand the set of established priority areas and actual policy efforts within the field of innovation policies. First, current priority areas are identified on the basis of the latest Trend Chart reports for Norway[4] as well as recent policy documents such as white papers, government reports, action plans, law amendments, etc. Secondly, we provide a picture of the the scale and direction of actual policy efforts by mapping the largest innovation policy measures by annual budget.

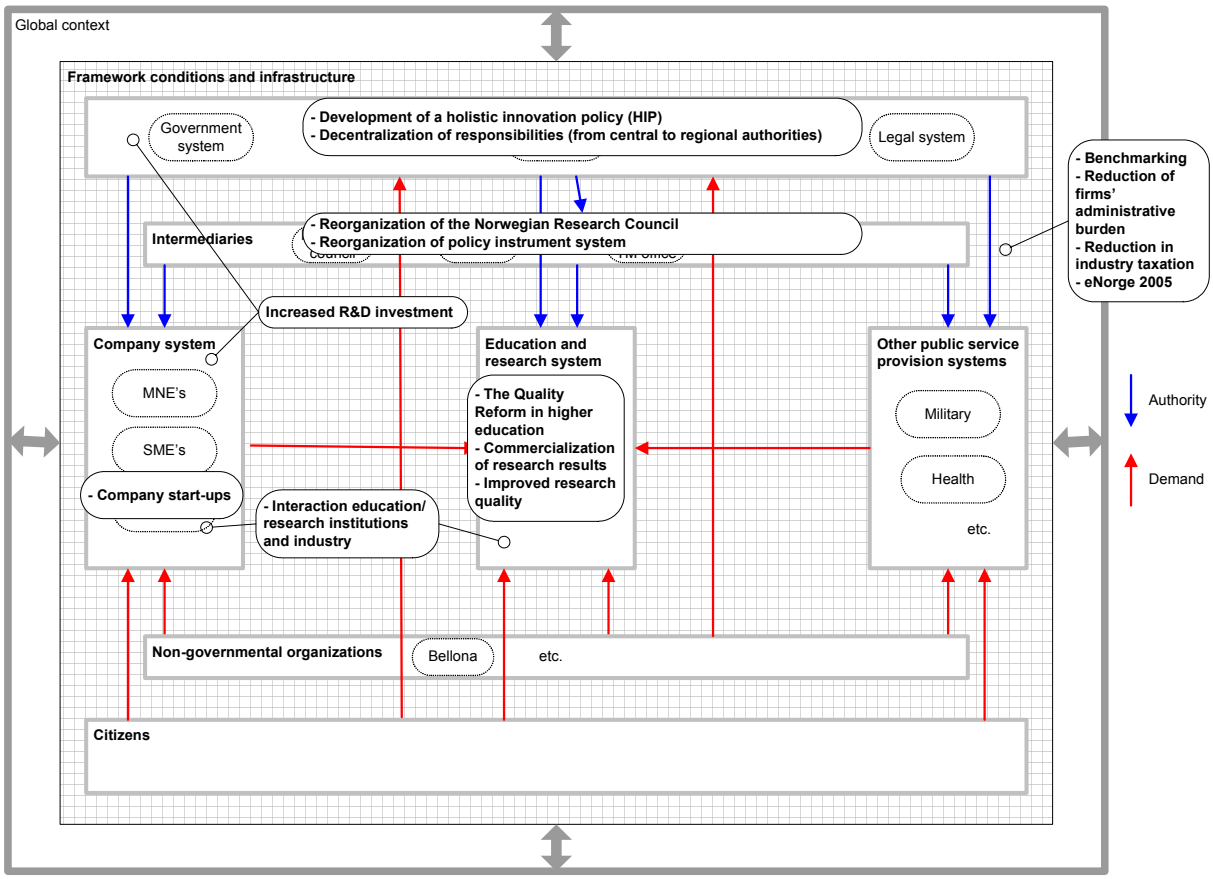
In conclusion, we provide a summary of the recent government proposition *Instruments for an innovative and creative industry*. The proposition is part of the Government's plan to develop a new "holistic" innovation policy. Thus, the proposition - and the reactions to it in Parliament - gives us an indication as to how the Norwegian policy mix will develop in the future.

Current priority areas

Figure 4. provides a picture of current major features in Norwegian innovation policies.

[4] The reports contain a section on innovation policy developments, which accounts for the areas in which the focus and drive in innovation policies are concentrated.

Figure 4. Current priority areas



Against this background, it is possible to identify seven overriding areas in which the present interest and drive in Norwegian innovation policies is concentrated: the actual contents and organization of innovation policies; the general framwork conditions for Norwegian industry; the scale and quality of national research and development; the quality of higher education; the commercialization of research results; the level of interaction between industry and institutions for education and research; and the scale of company start ups.

Contents and organization of Norwegian innovation policies

The development of a new holistic innovation policy (HIP) was initiated by the Minister of Education of Research in 2002 (see separate assessment). The new policy is to be characterized by a coherent understanding of traditionally separate policy areas in order to ensure an effective use of existing resources and to avoid that different policy measures are in conflict with each other or in other ways hinder innovation. The process has been placed under the leadership of the Ministry of Industry and Trade, but - as the main objective is to establish a horizontal, intersectoral policy - it involves other Ministries as well as actors outside the Government.[5]

5 Koch, Per M., TREND CHART Country Report: Norway, September 1 2003

The process has hitherto resulted in an "innovation plan" entitled "Fra idé til verdi", which was published on October 23rd 2003.[6] As part of the HIP process, the Government has also proposed a comprehensive reorganization of the business oriented policy instrument system.[7] The proposition is presented in more detail below.

Another recent effort concerning the organization of the Norwegian innovation policy system is the reorganization of the Norwegian Research Council (NFR) which came into effect in September 2003. The decision was made by the Government in 2002, and was for a large part based on an evaluation of NFR which pointed to weaknesses in the coordination of Norwegian research. The previous six "theme- based" divisions have been replaced by three "function-based" divisions:

- a division for disciplinary development
- a division for innovation and user-initiated R&D
- a division for strategic efforts

The new organization is to ensure that Norwegian research actively contributes to innovation and industrial development by facilitating interaction between on the one hand industry and the institute sector, and on the other hand basic and applied research.[8]

The delegation of responsibilities from central to local authorities is yet another current focus area touching upon the organization of the Norwegian innovation policy system. The Government is in favour of giving the counties more responsibility for resource allocation and development in the regions. Thus, the administration and allocation of innovation policy measures and funds are to be increasingly the responsibilities of regional rather than central authorities. This trend is discernable in the 2003 state budget where parts of the regional funding have been decentralized to the counties, who are free to use parts of this funding to finance innovation policy measures.[9]

Framework conditions

The appointment by the Government in 2000 of a Commission for Benchmarking (Referansetestingsutvalget) reflected an interest in improving the framework conditions for industrial activities in Norway on the basis of comparisons with framework conditions in other countries. The commission was to evaluate the use of benchmarking as a method and develop a system for the evaluation of the framework conditions for industrial wealth creation. In its report, the commission recommends that the Ministry of Industry and Trade - possibly in cooperation with other ministries - is made responsible for industrial framework condition benchmarking; that there should be established a reference group with the

6 http://www.odin.dep.no/archive/nhdvedlegg/01/09/fraid001.pdf

7 St.prp. nr. 51 (2002-2003) Virkemidler for et innovativt og nyskapende næringsliv

8 http://odin.dep.no/ufd/norsk/aktuelt/pressem/045071-070067/index-dok000-b-f-a.html; http://www.tu.no/arbeidsliv/article.jhtml?articleID=21680; Koch, Per M., Monitoring, updating and disseminating developments in innovation and technology diffusion in the Member States – The TREND CHART: Norway, Covering period: October 2001-September 2002

9 White Paper No 31 (2002-2003), White Paper on Big Cities (St.meld. nr. 31 (2002-2003), Storbymeldingen); Koch, Per M., Monitoring, updating and disseminating developments in innovation and technology diffusion in the Member States – The TREND CHART: Norway, Covering period: October 2001-September 2002

responsibility for updating and development; and - with reference to the EU Lisbon-strategy - that benchmarking exercises should be held every second year.[10]

In order to increase productivity and efficiency in industry, it is a political goal to reduce firms' administrative burden. As part of a broader programme for the modernization of the public sector, the Government has introduced the action plan "Simplifying Norway". The plan is to provide Norwegian industry with a sound regulatory framework and user-friendly public services. Emphasis is placed upon:

- making the regulatory framework easily accessible
- improving regulations in targeted areas
- strengthening the knowledge base for decisions on new regulations and other government reforms
- reducing firms' reporting obligations
- making the public sector aware of the needs of industry

It is the Government's ambition that the quality of Norwegian public services is to give firms an international competitive advantage. An advisory forum with participation from the business organizations has been set up in order to secure a balance between the needs of industry on the one hand and society at large on the other hand. The Government is to present a revised and updated plan in the autumn of 2003.[11]

Traditionally, competition policies have not been an integral part of Norwegian innovation policies. However, stimulating the development of an innovative industry is presented as one of the motives for the action plan for competition policies which has been initiated by the Government. The action plan is part of the programme for modernizing the public sector, and the main focus is upon

- strengthening the position of the Competition Authority (Konkurransetilsynet)
- assessing laws and regulations in order to remove arrangements that may impede competition
- developing a public purchasing policy that promotes competition.[12]

Improving the conditions for value creation by reducing industrial taxes is a core issue for the present Government and a central priority in the 2003 state budget. 2002 saw the removal of the investment tax and an increase in depreciation rates. One central initiative in 2003 is the extension of the tax incentive scheme SkatteFUNN. Whereas the scheme, which gives tax

10 http://odin.dep.no/nhd/norsk/publ/utredninger/NOU/024001-020006/index-ved001-b-n-a.html; http://odin.dep.no/odinarkiv/norsk/dep/nhd/2000/pressem/024041-070003/index-dok000-b-n-a.html; Koch, Per M., Monitoring, updating and disseminating developments in innovation and technology diffusion in the Member States – The TREND CHART: Norway, Covering period: October 2001-September 2002

11 From words to action – modernization, efficiency improvement and simplification in the public sector (Fra ord til handling – modernisering, effektivisering og forenkling I offentlig sector), report to Parliament from the Ministry of Labour and Government Administration, 24.01.02 (electronic version at http://www.dep.no/archive/aadvedlegg/01/02/85128065.pdf); Presentation of the action plan Simplifying Norway on the Government's web-pages (in English), http://odin.dep.no/nhd/engelsk/publ/handlingsplaner/024081-220006/index-dok000-b-n-a.html

12 From words to action – modernization, efficiency improvement and simplification in the public sector (Fra ord til handling – modernisering, effektivisering og forenkling i offentlig sektor), report to Parliament from the Ministry of Labour and Government Administration, 24.01.02 (electronic version at http://www.dep.no/archive/aadvedlegg/01/02/85128065.pdf)

reductions for industrial R&D investments, originally was targeted towards small and medium sized enterprises, it now applies to all firms - irrespective of size.[13]

eNorge 2005 is the Government's plan for IT policies for the period 2002-2005. The overriding goal of these policies is to exploit the possibilities offered by information technologies, the use of which is seen as an important impetus for societal change and improvement. eNorge has three focus areas:

- Value creation in industry: A strengthening of the development and use of information technology in industry is believed to contribute to value creation in industry by increasing innovation and competitiveness.
- Efficiency and quality in the public sector: The use of IT is to improve the quality and efficiency of public services.
- Participation and identity: The possibilities offered by IT are to be open to all citizens, and to be exploited in the conservation and development of Norway's cultural heritage, identity and languages.[14]

Research and development

Increasing R&D investments as a proportion of GDP is a central political objective. In 1999 investments amounted to 1,70 % of GDP, which is below the OECD average and the lowest share among the Nordic countries. The Government's goal is that Norwegian investments by 2005 as a minimum should have reached the OECD average. The State is to play a significant role in achieving this goal, i.a. by increasing the capital of the public Fund for Research and Innovation. However, the Government maintains that industry is to be responsible for 60% of the increase. The tax deduction scheme SkatteFUNN has been introduced as an instrument for increasing industrial spending on R&D.[15]

It is also the ambition of the Government to strengthen Norwegian research in qualitative terms. Several evaluations have indicated that the quality of the research being conducted is low, at least in some disciplines. One subsequent government initiative is the establishment of "centres of excellence" - research groups united under a common leadership which are given long-term financing based on a research plan. In addition, the Government wishes to increase the number of researcher recruits and to strengthen the funding of scientific equipment.[16]

Quality in higher education

The Norwegian system of higher education is presently undergoing major changes referred to as "the quality reform". Among the changes are

- the introduction of a new degree structure consisting of three levels: Bachelor (three years), master (two years) and Ph.D. (three years)
- the introduction of a new grades system

13 Government proposition No 1 (2002-2003) The state budget including the Social Insurance Scheme [folketrygden]

14 http://odin.dep.no/nhd/norsk/enorge/p10001876/024101-990129/index-dok000-b-n-a.html

15 Koch, Per M., Monitoring, updating and disseminating developments in innovation and technology diffusion in the Member States – The TREND CHART: Norway, Covering period: October 2001-September 2002; http://www.skattefunn.no

16 Koch, Per M., Monitoring, updating and disseminating developments in innovation and technology diffusion in the Member States – The TREND CHART: Norway, Covering period: October 2001-September 2002; http://www.skattefunn.no

- the establishment of a new national organization for quality in education, NOKUT, whose main task is to evaluate the mechanisms for quality assurance in both public and private universities and colleges

The quality reform was initiated by the previous Labour Government in 2001, and has been followed up by the present Conservative-Centre Government.[17]

Commercialization of research results

It is a political goal that inventions based on publicly funded research should be commercialized, and hence exploited to the benefit of society at large. Universities and colleges have been given a legally based responsibility for promoting the practical use of scientific research results. In 2002, a government appointed committee presented its report on commercialization of results from university and college research. Based on this work, there has been a political process leading up to a recent amendment of the law on rights to inventions by employees. Unlike other employees, teachers and researchers at universities and colleges have hitherto had the primary right to patent or commercialize their own research results. The law amendment implies that this right is transferred to the institution. This is believed to result in the establishment of institutional structures which will ensure that research results are patented and made available for industrial use.

The political interest in stimulating the commercialization of research results is also reflected in several policy instruments. The FORNY programme aims at promoting commercialization of research based business concepts or ideas conceived at universities and colleges as well as research institutes. Also, the science parks actively help university and college researchers patenting, developing and marketing their inventions vis-à-vis industry.[18]

Interaction between industry and education/research institutions

Interaction between education/research institutions and industry is a central theme in Norwegian innovation policies. In the so-called "Government-platform" - a document which outlines the main ambitions of the present Government - it is emphasized that the knowledge transfer between universities/colleges and industry is to be strengthened.

A number of policy measures aim at increasing the links between research institutions and industry, e.g.:

- the user driven programmes, the objective of which is to actively involve firms in publicly funded R&D programmes
- the NT programme, which gives support to innovation in Northern Norway by i.a. developing networks of companies and knowledge institutions
- the MOBI programme, which aims at promoting innovation in firms i.a. through establishing links to research environments

17 http://odin.dep.no/ufd/norsk/aktuelt/pressem/045071-070077/index-dok000-b-f-a.html
Koch, Per M., Monitoring, updating and disseminating developments in innovation and technology diffusion in the Member States – The TREND CHART: Norway, Covering period: October 2001-September 2002

18 Innst.O.nr.6 (2002-2003) (electric version at http://www.stortinget.no/inno/200203-006-001.html; Koch, Per M., Monitoring, updating and disseminating developments in innovation and technology diffusion in the Member States – The TREND CHART: Norway, Covering period: October 2001-September 2002; http://program.forskningsradet.no/forny/om/

- Value creation 2010, which is to promote innovation at the regional level through strong interaction between industry and reseach
- Science parks, which are property-based initiatives with operational links to education/research institutions designed to encourage the formation and growth of knowledge-based industries[19]

Company start-ups

Facilitating company start-ups is an expressed political goal and a central motive behind the current restructuring of business oriented policy instruments and institutions. Today, there are several policy instruments oriented towards start-ups. Science parks play an important role in encouraging the establishment of new technology-based companies, as do the programme for incubator activities (in which science parks may participate) which stimulates the establishment of "incubators" – environments for the development of firms in the start-up phase. A related measure is the incubator grant scheme which provides financial support to entrepreneurs located in an incubator.[20]

A summary of innovation policy measures

This overview, illustrated in fig.5 below, confirms that the Norwegian policy mix has taken up the innovation systems perspective to a great extent, but, relative to the challenges perceived by many, fails to address some deeper concerns like industrial structure and globalisation. Still, some of the challenges are being met, at least in terms of political ambitions, like improved coherence and rationale in policy. The overall assessment is that the Norwegian system is capable to address proper challenges on the fringes, but fails to integrate and renew the foundations for industrial policy using perspectives from the innovation policy tool box and thinking. A number a areas are still challenges, as they have been over many years, like the institute sector and funding of R&D, without being addressed properly in the wider policy system.

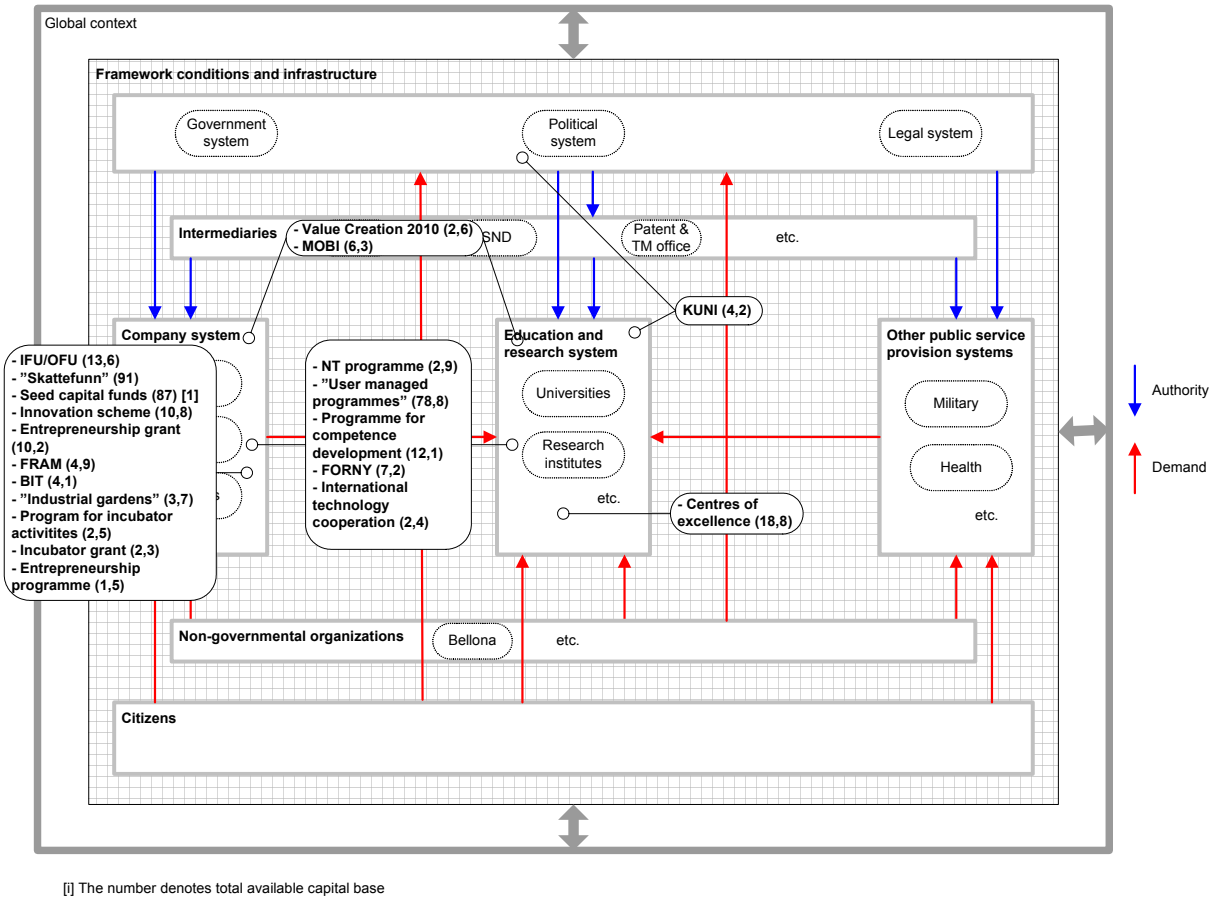
Looking ahead: the 2003 Government proposition Instruments for an innovative and creative industry

On March 28th 2003, the Ministry of Trade and Industry presented to Parliament a proposition entitled Instruments for an innovative and creative industry. In this document, the Government proposes a comprehensive reorganization of the business oriented policy instrument system, with the aim of making the system more efficient and better suited to facilitate value creation in Norwegian industry. The proposition is based on a review of the existing innovation policy instruments (Virkemiddelgjennomgangen), and is part of the Government's initiative to introduce a new "holistic" innovation policy.

19 Koch, Per M., Monitoring, updating and disseminating developments in innovation and technology diffusion in the Member States – The TREND CHART: Norway, Covering period: October 2001-September 2002

20 Koch, Per M., Monitoring, updating and disseminating developments in innovation and technology diffusion in the Member States – The TREND CHART: Norway, Covering period: October 2001-September 2002

Fig. 5: The 20 largest policy instruments



[i] The number denotes total available capital base

According to the document, the policy instruments should increasingly be targeted towards the same goal, which should be to promote innovation nationwide. To achieve this, the instruments are mainly to focus upon the following three areas:

- research and competence development
- the idea, development and commercialization phases
- internationalization,

and to target the following five main groups:

- entrepreneurs
- young companies
- the innovation system
- small and medium sized enterprises with ambition and potential for growth
- researchers and R&D environments in industry and the research and education sector.

On a more specific level, the reorganization of the policy instrument or delivery system leads to the establishment of a new organization for innovation and internationalization by January 1st 2004. It is proposed that the new organization is to be represented abroad as well as domestically, and that it is given the responsibility for the measures presently administered by

the Norwegian Industrial and Regional Development Fund (Statens Nærings- og Distriktsutviklingsfond, SND), the Norwegian Government Consultative Office for Inventors (Statens Veiledningskontor for Oppfinnere, SVO) and the Norwegian Trade Council (Norges Eksportråd), as well as some of the innovation oriented policy measures administered by the Research Council of Norway (Norges Forskningsråd, NFR).

The suggested organizational form of the new unit is a "Special law company" (Særlovselskap). The company is to own and administer a network of offices all around the country, which is to provide a single "point of entrance" to the policy instruments and thus making them more easily available to their users. The main reason for organizing the unit as a "Special law company" is that such an arrangement allows for the necessary balance between the Government's need for control on an aggregated level on the one hand, and the unit's need for independence and freedom to make decisions on a day-to-day basis on the other hand.

Other proposals forwarded in the document, include an increase in the budget for regional funds from NOK 500 mill (€ 60,7 mill) to NOK 1 billion (€ 121,4 mill) and that the Norwegian Space Agency (Norsk Romsenter) is to become a more independent state institution (forvaltningsorgan med særskilte fullmakter).

The government proposition was discussed in Parliament on June 18th 2003, and was in general positively received. There was broad agreement on the need for increased co-ordination of the policy instruments, and that innovation should be a central goal.

Parliament was also in favour of the establishment of a unit for innovation and internationalization. It was however decided that the unit should include the Norwegian Tourist Board (Norges Turistråd, NTR) in addition to the institutions suggested in the proposition. Also, the possibility for including other institutions or instruments at a later point is to be held open.

While Parliament's reactions to the proposition all in all were positive, a few critical comments were made. For one thing, some Members of Parliament expressed "a slight surprise" with the fact that decisions regarding policy instruments have been made before the actual content of the new "holistic" innovation policy has been established, pointing out that it would have been more rational to deal with the two matters in reverse order. Also, several of the parties in opposition argued that more attention should be paid to regional development, and that the objective of the policy instrument system should be to promote regional industrial activities in general, and not only activities that are related to innovation.

Indicators of horizontalization

Measuring *horisonatilisation* in national STI policies is a challenging task. So far there is no an established set of indicators for measuring that. The challenge in this part of MONIT is to grasp qualitative aspects of policy in a meaningful system of metrics. There is a growing number of studies on qualitative indicators for policy action. This body of knowledge can be helpful for MONIT. However, one should be aware of the obvious limitations of such indicators.

The Norwegian organization of STI policies is in this respect an interesting case study for several reasons. Firstly, there is a strong and long tradition of a *sector-oriented R&D and innovation funding policy,* meaning that each ministry has a particular responsibility *to fund*

research relevant to ministries' objectives. This decentralized pattern of public R&D funding has recently been viewed as a major hindrance for an overall harmonisation of the Norwegian innovation policy efforts (Arnold, 2001).

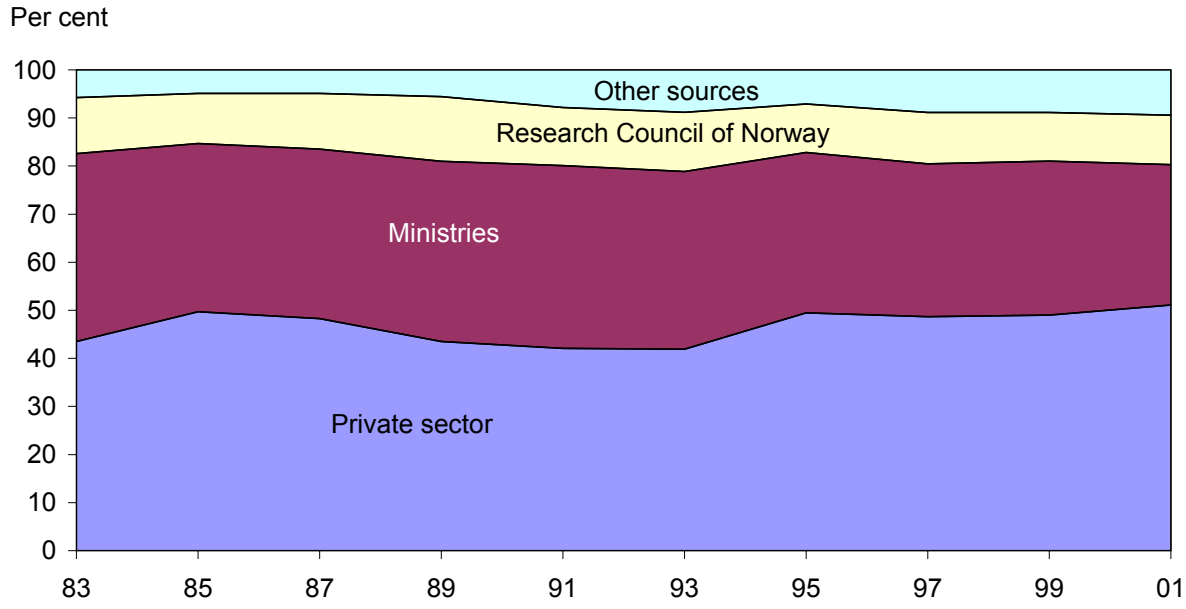
Secondly, the Research Council of Norway was established in 1993, by merging Norway's existing 5 research councils. The main *coordination* responsibility of national STI-policies is delegated to the Research Council of Norway (Norges forskningsråd), despite the principle of sector-oriented R&D and innovation funding policy.

Therefore, there is a tension between ministries' sector-oriented R&D funding policies and a centralized Research Council of Norway which complicates the horisontalisation efforts of national STI- policies in Norway. In the following we shall briefly present some basic indicators and facts about STI-funding policies in Norway.

ST funding in Norway

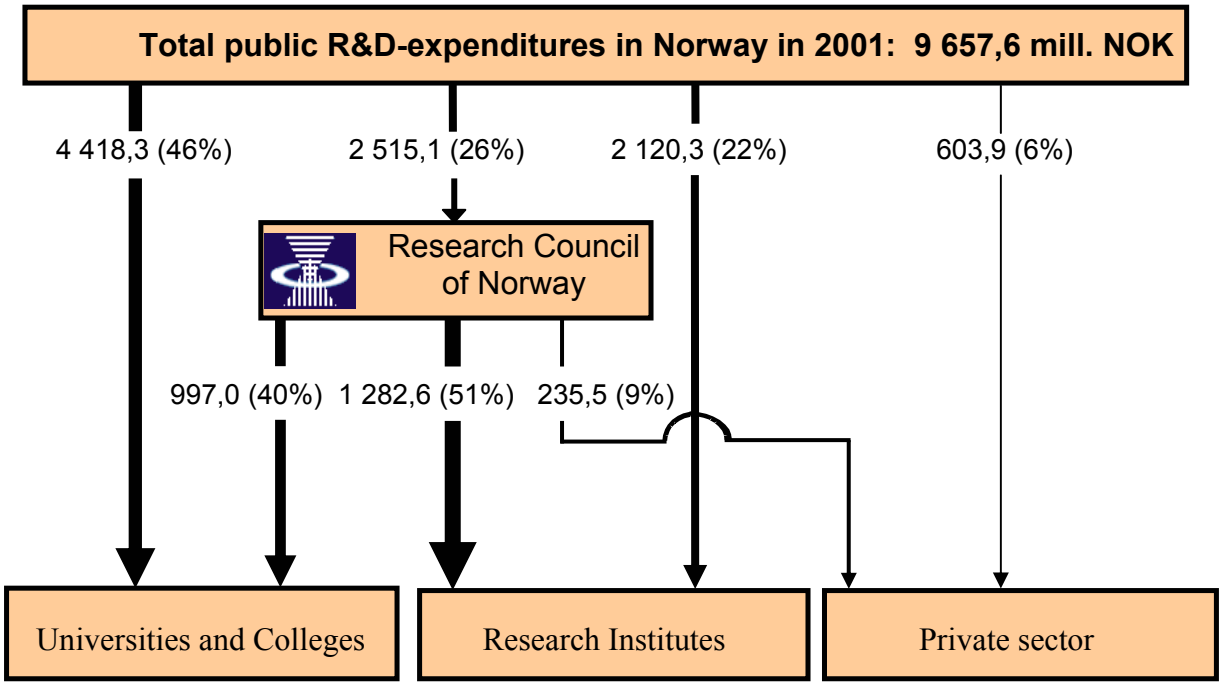
Figure 5 displays shares of R&D funding in the Norwegian innovation system the last 20 years. In 1990's there is a marginal change towards more private R&D funding relative to public sector. Figure 6 below displays the flows of public R&D funds in 2001.

Figure 5: R&D expenditure in Norway by source of funding. Shares of total R&D-funding (20,3 billion NOK in 2001). 1983-2001.



Source: NIFU and Statistics Norway

Figure 6: Public funding to performing sectors. 2001.



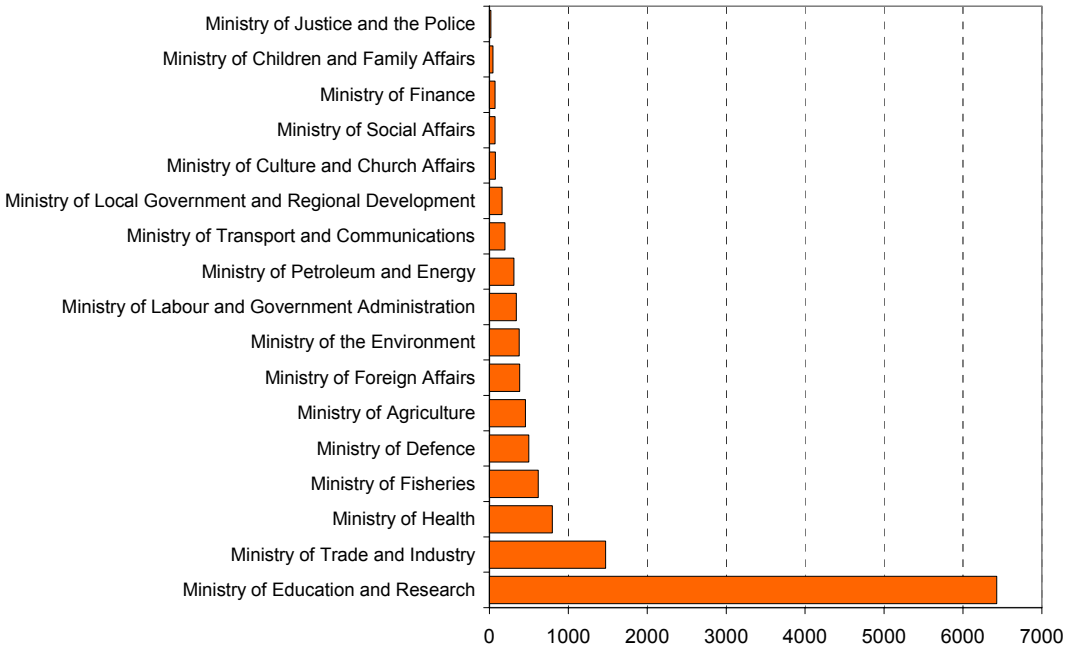
Source:NIFU/SSB

Figure 6 illustrates some of the dilemmas in coordinating ST-policies in Norway. Research Council of Norway (RCN) share of the total public R&D funding was 26 per cent in 2001. R&D direct subsidies to the private sector (as performing sector) are mainly channeled through other sources than RCN, mainly through The Norwegian Industrial and Regional Development Fund (SND). Collaboration between SND and RCN has been quite successful the last years and there are several concrete examples showing an increasing degree of intended complementarity between these two key institutions for innovation policy in Norway.

Ministries funding of R&D performing institutions takes place either directly with funding allowances or through RCN/SND. Figure 3 shows the breakdown of public R&D funding by ministries.

Figure 7 shows clearly the sector-oriented character of public R&D funding in Norway. Of course the most important ministries for ST-policies in Norway are the Ministry of Education and Research and the Ministry of Trade and Industry. However, other ministries, such as, The Ministry of Health, Ministry of Fisheries, etc. are important funding actors of R&D performed by research institutes and the private sector. Several studies of the Norwegian innovation system concludes that a better coordination between Ministry of Education and Research and the Ministry of Trade and Industry could be achieved.

Figure 7: Norwegian public R&D-funding by ministries.2003. Project assignements excluded. Million NOK.



Source: NIFU

For a better understanding of the potential for an horizontal and coordinated ST-policy in Norway is important to know not only *who* are the main funding agencies, but also what kind of funds are channeled through the state budget. Table 1 below shows some of the main types of R&D funding in Norway in addition to ordinary R&D transfers via the state budget.

Table 1. Types of public funding of innovation in Norway

Ministries' funding of R&D and innovation
Funding of the Norwegian participation in international R&D organizations and in EU's research
Research Fund (Forskningsfondet)
Tax deductions of R&D costs (SkatteFUNN)
Public procurement of technological products and services

Norwegian participation in EU's Framework programmes is seen as the main instrument for a more international oriented R&D activities in Norway and have had a remarkable direct and indirect effects on how modern innovation policy is performed in Norway. Not only R&D performers have been more exposed to international R&D collaboration, but also ministries and RCN has been exposed to international policy processes. From this point of view the Norwegian participation to EU's research at a policy level have had a catalytic effect on the advancement of a more coordinated Norwegian ST-policies.

Apart from the ordinary governmental R&D funding there is another important ST funding source in the Norwegian policy system. That is the *Norwegian Research Fund* of about 350 million NOK in 2002. This type of funding is mostly earmarked for high-quality basic research, but it also provides funding to alleviate various 'bottlenecks' in the Norwegian innovation system (see Forskningsrådet 2003). This type of funding is of great interest in the future since it could be used as an instrument to achieve a better coordination within and between national ST-policies. Yet, it is too early to assess the long-run effects of the Norwegian Research Fund on the Norwegian innovation performance.

Tax deductions for R&D expenditures is also a new policy measure in Norway, launched in October 2002, and has been welcomed by many firms, most of them having a low R&D performance. A high-profile evaluation of the effects of this new policy measure is already under planning. A particular important issue in this evaluation is the direct and indirect effects of tax R&D deductions on the overall coordination of ST-policies.

Last but not least is the question of how *public procurement policies* are managed and coordinated in Norway. To our knowledge there is a poor if any kind of coordination between state agencies and ministries with respect to procurements of high importance for the Norwegian innovation system. This is a key question, since the value public procurement in Norway amounts to 200 billion NOK per year. Although this figure includes all types of public procurements, it is almost certain that the value of procurements of innovation intensive products and services is much larger than the value of the total R&D public funding.

Measuring coordination in innovation policy agendas

Some few qualitative indicators may be introduced in order to address this question. These are:

- *Importance and frequency of innovation white papers:* The Norwegian innovation white paper is signed by the minister of education and research and is published every 4-6 years. The last white paper has been published in 1998 (Stortingsmeld. Nr. 39, 1998-99). The innovation white paper is signed by the minister of education.

- *A mechanism for regularly producing a government innovation policy agenda or innovation strategy.* The Ministry of Education and Research is responsible for the overall R&D policies, for funding large parts of basic science in the universities and colleges, and for coordinating sectoral R&D policies. In this respect and at the governmental level there are two high level committees both chaired by the Ministry of Education and Research focusing on science and technology policy related issues: the inter-ministerial Research Forum for Government Officials (departementenes forskningsutvalg – DFU) and the Government's Research Board (Regjeringens forskningsutvalg – RFU). DFU consists of high level civil servants in ministries with a substantial R&D-budget and its main responsibility is to discuss issues of organization of research and innovation policies, including R&D-budget. RFU consist of ministers in ministries with a substantial R&D-budget and its main responsibility is to prepare policy proposals for the cabinet.

- *The number of ministries mention innovation in their mission statement*: In Norway only the Ministry of Trade and Industry explicitly mentions innovation as its major objective. However, and as mentioned earlier, almost all ministries have and take

seriously their responsibility for funding research (and innovation) falling within their cognitive domain (see for example Fiskeridepartementet 1998, Landbruksdepartementet 2001, Miljøverndepartementet 2001). From this point of view one may say that in the Norwegian governmental system there is relative high awareness but, perhaps, little focus on ST policies.

- *Number of STI-programmes are governed by more than one ministry?* RCN identifies and implement a large number of multidisciplinary R&D-programmes. All these programmes are almost invariably discussed, negotiated, approved and funded by one or more ministries. Therefore, in important innovation areas, such as, biotechnology, ICT, nanotechnology, etc. there are many R&D-programmes funded jointly by many ministries. This again underlines the importance of a RCN as a coordinating actor of STI-policies in Norway, but highlights also the high degree of coordination costs for funding type of innovation not clearly defined within ministries jurisdiction.

Annex: Innovation policy measures 2002: Complete list

	Title	Period	Annual budget 2002 (NOK)	Annual budget 2002 (€)	Description	MONIT classification
1	TaxFIND	2002-indefinite	750 mill	91 mill	SkatteFunn is a measure that gives SMEs tax allowances for investments in R&D. 18% (or 20 % in the case of SMEs) of expenses for R&D projects may be deducted. The basis for deduction is R&D expenses of up to NOK 4 mill (approximately € 530 000) for internal projects, and another NOK 4 mill for co-operative projects (or NOK 8 mill for co-operative projects alone). The R&D projects should aim at generating new knowledge, information or experience which is of value to the development of new products, services or production processes.	Company system
2	The seed capital funds	1997-indefinite	720 mill*	87 mill*		Company system
3	User driven programmes	Start date varies – no definite ending	App. 650 mill	App. 78,8 mill	The public 'user driven' R&D programmes are based on the premise that enterprises wishing to take part in publicly funded R&D programmes should have a decisive influence on the direction, control, management and implementation of the relevant programmes and projects.	Company system Education/research system
4	Centres of excellence	2001-2011	155 mill	18,8 mill	The instrument Centres of Excellence is to stimulate Norwegian research environments to establish centres dedicated to long-term, basic research at a high international level to raise the quality of Norwegian research.	Education/research system
5	The IFU/OFU programme	1994-indefinite	112 mill	13,6 mill	The main objective of the IFU programme is to increase the co-operation between SMEs and larger	Company system

					firms. An IFU-contract is an agreement between two companies, aimed at developing a product or a process needed by one of the companies (the customer). One of the two should be an SME. The State will support the endeavour financially. In the OFU-programme the customer is a public institution.	
6	Programme for competence development	2000-2003 (may be continued)	100 mill	12,1 mill	The Ministry of Education and Research has established a programme for competence development that is to contribute to innovation in the market for life long learning. Companies, municipalities, knowledge institutions, labour organisations and others may initiate projects under this programme.	Company system Education/research system
7	Innovation scheme	Includes several schemes with varying start dates – ending not decided	89 mill	10,8 mill		Company system
8	The entrepreneurship grant/the business establishment grant	1989-indefinite	84,2 mill	10,2 mill	The entrepreneurship grant is a scheme for business entrepreneurs in all parts of Norway, but with a particular emphasis on entrepreneurs in cantonal Norway. The main aim of the scheme is to stimulate to increased business establishment, to create durable and profitable jobs for both women and men.	Company system
9	FORNY	1994-2010	59 mill	7,2 mill	The FORNY programme is to support the process for wealth creation by improving the ability to commercialise research-based business concepts or ideas conceived at universities, colleges and research institutes, professionalize the process of commercialisation; turn the commercialisation of research-based business concepts into a strategic area of activity and set up a permanent service of	Company system Education/research system

					commercialisation of research-based business concepts through the establishment of a company that can deal with all aspects of the commercialisation process.	
10	MOBI Consists of three sub-programmes: • TEFT • ARENA • nHS	2002-2009 TEFT: 1994-2003 ARENA: 2001-2005 nHS: 2002-2004	52,1 mill TEFT: 20,8 mill ARENA: 2,3 mill nHS: 28,9 mill	6,3 mill TEFT: 2,5 mill ARENA: 0,3 mill nHS: 3,5 mill	MOBI (Mobilisation for R&D related innovation) is an 'umbrella' programme covering several smaller programmes. Its main goal is to promote learning, innovation and value creation in companies with little experience with R&D. In general this means SMEs. In many of these companies there are barriers to innovation, e.g. high risk associated with innovation activities, lack of relevant expertise and of knowledge of how to acquire such expertise, and lack of capital. MOBI's ambition is to reduce the number and impact of such barriers. The programme also aims at increasing the companies' R&D based innovation efforts by stimulating long term co-operation with other companies, R&D environments and actors from innovation policy institutions, particularly on a regional basis. MOBI is to continue and develop the activities of the BRO Programme, and covers the following four sub programmes: *Industry oriented focus on colleges* (nHS, Næringsrettet høgskolesatsing) – the objective of which is to establish competence increasing co-operation between companies and public university colleges *SME Colleges* – which aims at strengthening the position of university colleges in regional innovation *TEFT* – which aims at promoting the transfer of technology from research institutes to SMEs	Company system Education/research system Political system TEFT: Company system Education/research system ARENA: Company system Education/research system Political system nHS: Company system Education/research system

					ARENA - Regional innovation pilots – the goal of which is to contribute to the development of regional innovation systems and industrial clusters In addition to stimulating the innovation efforts of firms, MOBI's ambition is to increase industry oriented research within R&D environments and to improve the institutional framework for innovation. The programme will also function as a 'laboratory' for the development of innovation policy measures, where existing measures are to be improved and new measures developed and tested.	
11	FRAM	1992-2005 (may be continued)	40 mill	4,9 mill	FRAM supports basic learning within SMEs, particularly in the field of leadership and the building of company strategies, the goal being to make the companies more profitable.	Company system
12	KUNI	2002-2007	35 mill	4,2 mill	KUNI is a research programme which aims at strengthening the theoretical and empirical knowledge base for industrial innovation policies. The programme wishes to contribute to the development of a clearer appreciation of the factors contributing to value creation ; a better decision basis for industrial policies at both national and regional level ; and prominent research environments that can contribute to the international knowledge development in the field. KUNI focuses on two areas of research: (1) Innovation policy and value creation in an open economy; and (2) The role of knowledge development in innovation. Within the first area, there is need for more knowledge about the factors influencing innovation ; the factors prompting commercial exploitation of innovations ; the areas in	Education/research system Political system

					which returns on innovation differ significantly between industry and society at large ; the effect of innovation on firm organization ; clusters and cluster formation ; the factors that promote and restrain innovation ; the relative importance of selective and general measures in innovation policy and regional policy ; the relative importance of market power and competition in promoting innovation based industrial development ; and the relationships between ownership and innovation. Important issues within the second area of research are the value creation potential in new forms of knowledge and new combinations of knowledge; the facilitation of systematic knowledge development; and the exploitation of the possibilities offered by ICT. The programme encourages research environments to develop projects within the two areas of research. The programme gives priority to a small number of large projects in order to secure quality through concentration and long term activity. Some small projects will be included, however, to ensure flexibility. The results of the programme are to be communicated continuously through seminars, conferences, the internet, mass media and scientific journals.	
13	BIT	1989- ending not decided	34,1 mill	4,1 mill	The BIT Programme is to improve the profitability and competitive ability of firms by developing common ICT solutions adapted to specific sectors of industry.	Company system
14	Industrial gardens	1999-ending not decided	30,6 mill	3,7 mill	The objective of the industrial garden programme is to stimulate value creation in the regions by creating	Company system

					regional clusters of SMEs which offer attractive work opportunities for highly educated persons. An industrial garden is a group of knowledge intensive firms gathered under one roof. The idea is, that by sharing premises the firms constitute a professional and social environment which stimulates co-operation, exchange of knowledge, and mutual skills upgrading. The industrial garden environment is to stimulate the starting up of development activities – either within the single firm or in co-operation between the firms. In addition, the arrangement gives the participating firms the opportunity of establishing a cost saving common technical infrastructure. Each industrial garden is connected to the other industrial gardens - i.a. through a common web-site and seminars - and should also be linked to wider industrial and competence networks. As of today, there are 30 industrial gardens in Norway. Most of them are specialized within the fields of data processing, business services, trade and health and social services.	
15	The NT programme	1987-2004 (may be continued)	24 mill	2,9 mill	The programme gives support to innovation in Northern Norway, by providing capital and advice and by developing networks of companies and knowledge institutions.	Company system Education/research system
16	Value creation 2010	2001-2010	21,3 mill	2,6 mill	The main goal of the Value creation 2010 programme is to promote in-firm and network based innovation, particularly at the regional level. On the one hand the programme aims at stimulating broad employee participation and co-operation with researchers within single firms. On the other hand networks – or	Company system Education/research system Political system

					development coalitions – of firms, research institutions and actors from innovation policy institutions are to be established. In addition the ambitions are to increase scientific knowledge about development and innovation processes and to improve the effects of innovation policy instruments.	
17	Programme for incubator activities	2000-2007	20,5 mill	2,5 mill	The objective of the programme for incubator activities is to stimulate the establishment of new firms with growth potential, and thereby to contribute to the development of strong regional and local environments for value creation. An incubator is an environment for the development of firms in the start-up phase. The incubator is located in an established centre of competence, and offers the firms physical premises and a technical infrastructure, advice and guidance on all matters concerning the start-up, and links to wider networks of competence and services, such as research and financial institutions. Any innovation oriented organizations, such as science parks, private firms, and knowledge intensive public enterprises (i.e. hospitals), can be hosts for an incubator. The incubators are open to firms who have a considerable growth potential, and who are in an early phase when support is crucial and the activity is connected with a high risk. The firms are to leave the incubator as soon as they have become well established and economically viable.	Company system
18	International technology co-operation	1999-ending not decided	20 mill	2,4 mill	The objective of this national scheme is to strengthen the international competitiveness of Norwegian firms, by stimulating technology transfer from	Company system Education/research system

					abroad; mapping the marketing possibilities for technology developed in Norway; and establishing networks and alliances between Norwegian and foreign firms. The target groups are various public institutions, universities and other research institutions, as well as firms.	
19	Incubator grant	2001-ending not decided	19 mill	2,3 mill	The aim of the incubator grant is to stimulate to increased establishment of competitive, future-oriented and innovative businesses contributing to innovation and business renewal in general. The incubator grant is a scheme for entrepreneurs located in an incubator. The grant is designated for start-ups with a high knowledge and technology level.	Company system
20	The entrepreneurship programme	2002 – ending not decided	12 mill	1,5 mill	The programme aims at helping knowledge intensive high tech SMEs commercialize their products and introduce them in international markets. The programme offers assistance in the fields of strategy, networking and marketing in the initial phase of commercialization and internationalization.	Company system
21	Women in focus	2000-indefinite	12 mill	1,5 mill	The goal of the measure is to increase the share of women in boards and in the management of SMEs, as well as to increase the share of women establishing their own businesses. The project will make use of women's competences and experiences, especially in areas in need of change and innovation.	Company system Education/research system
22	Programme for Entrepreneurship and Innovation in Norway	2001-2005	8 mill	1 mill	Programme for Entrepreneurship and Innovation in Norway (Program for entreprenørskap og nyskaping i Norge) was initiated by the organization Young Entrepreneurship. The programme is to develop methods, material and networks for the establishment of closer links between educational institutions and industry and the promotion of entrepreneurship in	Company system

					education on all levels. The programme will anchor a nation wide permanent institution which is to develop and implement models and methods for entrepreneurship in education and training in schools, colleges and universitites	
23	Network credit/network bank	1992-indefinite	7,3 mill	0,9 mill	The goal of the measure is to stimulate increased entrepreneurship to create new and profitable workplaces for entrepreneurs with limited capital needs. The measure is in principle sex neutral, but has until now mostly been used by women. The measure was first put into action by the women's committee of the fishing industry in Norway inspired by network banks in Bangladesh.	Company system
24	The Norwegian school of entrepreneurship	1999-ending not decided	5,8 mill (2003) **	0,7 mill (2003) **	The objective of the school is to increase value generation from research based start-ups at institutions of higher learning. The school offers an entrepreneurship education programme aimed at creating a culture where entrepreneurship is applauded.	Company system Education/research system
25	Venture cup	2000-2004	3 mill	0,4 mill	Venture cup is a competition that rewards good business plans.	Company system Education/research system
26	The icebreaking measure	1998-not decided	1 mill	0,1 mill	The goal of the measure is to contribute to increased use of design as a competitive force in Norwegian business life. The goal of the programme is increased understanding of the significance of design, and coordinate initiatives to increase the use of design in Norwegian businesses.	Company system
27	Dynamic local schools		750 000	92 500	The scheme is to stimulate entrepreneurship in order to establish new jobs. The programme0 is based on cooperation between schools, local authorities and local businesses and aims at teaching kids and young	Company system

					people industrial creativity and entrepreneurship.	
28	Start Norway		150 000 (2003)***	18 191 (2003) ***	The organisation gathers students for meetings where they can discuss entrepreneurship and get relevant information. The main aim of the organisation is to motivate students to innovation and renewal activities.	Company system

* The number denotes the total available capital base
** Annual budget for 2002 is not available
*** Annual budget for 2002 is not available