

# Developing a broad-based innovation policy in Finland

## Societal opportunities confronting administrative and political challenges

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### SUMMARY

Across advanced industrial countries, science, technology and innovation have come to play an increasingly important role among state policies as governments aim at fostering knowledge-based economic growth. Both in the European Union and in Finland, policies in this area are currently being transformed into a broad-based innovation policy. This article analyses this policy transformation and pays attention to the changes in the goal-setting of the policy, in particular by looking at how and to what degree other goals than economic growth and competitiveness have been integrated into the policy framework. In addition, the article identifies three key administrative and political challenges related to the emerging framework of a broad-based innovation policy.

### INTRODUCTION

During the last decades, Finland has embraced a national strategy of knowledge and knowhow in which the role of research and new technologies has been central. Science policy and, more importantly technology policy, have gained increasing weight among state policies since the 1980s. More recently, innovation policy has become a prominent and expanding policy sector while the state itself has gradually transformed from a welfare state towards a competition state (Pelkonen 2008a).

Internationally, Finnish policies in these sectors have been considered successful, manifested in the rapid structural change of the national economy during the 1990s as well as several top positions in global competitiveness rankings in the early 2000s. Although Finland has slightly lost its position in the latest rankings, it still ranks among the most competitive countries in the world (e.g. World Economic Forum 2008). Also the administrative model of Finnish science and technology policy has been object of much international attention (e.g. European Commission 2003; Swiss Academy of Engineering Sciences 2004).

Regardless of the recent success, both the administrative system as well as the policy content are currently being transformed in order to further promote the development of innovations and the competitiveness of the national economy. This article focuses on the current efforts to transform national science and technology policy towards a broad-based innovation policy (e.g. Cabinet Programme 2007; Ministry of Employment and the Economy 2008) and scrutinises challenges that emerge from these attempts. This transformation implies that the policy focus is being shifted from the development of technology and innovations towards their introduction and application across the sectors of the society. Besides being considered as a source of economic growth, innovations could thus be increasingly seen as solutions to far-reaching societal and environmental problems. As a result, the scope of the policy expands and such issues as the production of public services, func-

tioning of health care systems and human well-being become targets of innovation policy. At the same time, it also means that the promotion of innovations is becoming an increasingly important objective across state policy sectors.

This article analyses the expansion of the sphere and scope of science, technology and innovation policies in Finland. Attention is also paid to current innovation policy guidelines of the European Union as there are significant similarities with the new Finnish policy formulations. How have the goals of the policy changed and how are other goals than economic growth and competitiveness integrated into the framework of a broad-based innovation policy? To what extent has the expansion of science, technology and innovation policies made them more socially and environmentally oriented? What kinds of political and administrative challenges does the development of a broad-based innovation policy entail?

The article is based on three sets of data. First type of data consists of key policy documents related to the development of science, technology and innovation policies in Finland and in the European Union, in particular since the early 1990s. This includes the policy guidelines and reports by the most important policy-making actors – in particular the Science and Technology Policy Council, the Ministry of Trade and Industry (as of January 2008, Ministry of Employment and the Economy) and the Finnish Funding Agency for Technology and Innovation, Tekes. Second, two sets of interview data have been used. The first interview data comprises 17 interviews with decision-makers in Finnish technology policy and has been collected in 2000–2001. This interview data describes well the expansion of the sphere of technology policy in Finland in the late 1990s. The second interview data consists of 18 personal interviews with political decision-makers, members and secretaries of the Science and Technology Policy Council and representatives from different ministries, the Academy of Finland and Tekes. These interviews were carried out 2003–2005. This data focuses on issues of coordination and horizontal collaboration of science and technology policies. Third set of data consists of the Parliamentary discussion concerning the Government Report to the Parliament on Innovation Policy, held November 15, 2008. The transcribed discussion consists of 48 addresses and comments by ministers and members of the Parliament. Besides providing additional informa-

tion on the current Government's approach to innovation policy, the latter data also allows for shedding light on the views of different political parties, a perspective that has largely been missing in the analysis of innovation policy in Finland.

## COMPETING PARADIGMS OF NEW INNOVATION POLICY

Across advanced industrialised countries, the pursuit of knowledge-based economic growth has been placed among the core objectives of state policies. This can be seen as a part of a broader transformation from welfare states towards competition states. Bob Jessop (2002), among others, has argued that this change implies that states increasingly focus on competitiveness, put increasing weight on competitive advantages at the regional level and largely subordinate social goals to economic concerns. This transformation has also been reflected in the reshaping of policies concerning knowledge creation and diffusion, moving them towards promoting innovation and entrepreneurship (Borrás 2003). Accordingly, policy focus has shifted from science policy that has emphasised basic research and scientific education first to technology policy that stresses industrial application of research, the development of strategic technologies and technology transfer from universities to industry. Lately it has moved towards innovation policy which sees innovation processes increasingly complex and interactive, highlights the institutional and organisational factors that bear on the production and application of knowledge and in particular focuses on enhancing networks between different actors. Moreover, such a move towards innovation policy has tended to shift the emphasis from broader social objectives to economic aspects of the policy (Lundvall 2001).

Yet more recently, the paradigm of innovation policy has been questioned and a discussion of a new direction for policy-making in this area has emerged at the supranational level as well as at the national level in various advanced countries (e.g. OECD 2002; European Commission 2003). This has been related to the observed weaknesses in the area of innovation policy in the OECD countries (Edler et al. 2003). In particular, policies have been considered as being dominated by a linear model of innovation and characterised by a high degree of sectoralisation and low inter-

departmental cooperation which amount to a narrow interpretation of innovation policy. Accordingly, it has been argued that innovation policy should encompass a broader approach by taking into account factors that influence the emergence of innovations on a larger scale and by developing linkages and coordination across policy sectors (OECD 2002).

Broadly speaking, there are two somewhat competing and contrasting approaches to this new conception of innovation policy. On the one hand, it has been interpreted as a paradigm that further stresses the economic goals of growth and competitiveness. In this view, innovation should become a central target in all policy sectors. This should take place by placing innovation "at the heart of each policy area" (European Commission 2003, 11). This would largely be characteristic of policies of the competition state, as argued by Jessop and others. Such a perspective could be termed as *growth oriented innovation policy*.

On the other hand, there have been views of a comprehensive innovation policy which balances the goal of economic growth with other goals that may be in conflict with it, such as social and environmental policies (OECD 2005). In this perspective, innovation is seen not only as a source of economic growth but also – and perhaps increasingly importantly – as a solution to various societal and environmental problems. Accordingly, a broader innovation policy would not imply the penetration of market and innovation thinking into other sectors of policy but adjusting the imperatives of various policies under a broader framework (OECD 2005; cf. Pelkonen 2006; Lundvall 2001). Recently, Hautamäki (2008) has paid attention to the problems caused by the economic growth policy paradigm (in particular environmental degradation and climate change) and has urged that economic growth should be replaced by wellbeing, human development and sustainable development as the primary goal of innovation policy. Such 'sustainable innovation' would be based on ethically, socially, economically and environmentally sustainable principles and would take into account the long-term impacts that innovations and innovation processes have on people, societies, the economy and the environment. This would provide a basis for *sustainable innovation policy*. Given the recent reformulation of both EU and Finnish innovation policies, it is worth analysing to what degree they adopt these two competing approaches.

## **POLICY TRANSFORMATION IN FINLAND – FROM COMPETITIVENESS-ORIENTATION TO BROAD-BASED INNOVATION POLICY**

### **Strengthening of technology policy and the competitiveness objective**

During the 1960s the Finnish state became active in promoting science, and the societal importance of science became of increasing interest to policy-makers. Both the organisational machinery and resources for science policy were developed during the 1960s and 1970s. Towards the end of 1970s, however, the significance of new technologies as a source of growth and competitiveness of the economy was increasingly acknowledged. At the same time it was observed that Finland was a backward country in technological development and that economic growth in the country cannot rely on the traditional factors such as increasing use of forests, protected markets and adapting foreign technical knowledge (Lemola 2001). Together with the economic crisis and information technology revolution, these factors promoted the organisation of national technology administration. The starting shot was the establishment of a Technology Committee in 1979 to examine the social and economic effects of automation and micro-electronics. In its final report, the committee laid the foundations for the future development of technology policy in Finland. A strongly resourced technology policy was started with information technology, biotechnology and material technology as central objects of public funding. In 1982 the Government made a decision-in-principle in technology policy in which it decided to raise the share of R&D of GDP from 1,2 to over 2 percent by 1990. In the following year the National Technology Agency (Tekes, currently the Finnish Funding Agency for Technology and Innovation) was established to promote and finance technological development by implementing national technology programmes. Tekes quickly became an important planning and implementing organisation in technology policy with growing funds from the state budget. In 1987 the Science Policy Council was transformed into the Science and Technology Policy Council which strengthened the links between science policy and technology policy, created a high level political forum for the consolidation of these separate policy fields and gained increasing political weight (Pelkonen 2006). During the late 1970s and

the 1980s technology policy thus gained increasing importance and a strong position with respect to science policy (e.g. Allardt 1995).

In the 1990s, the state orientation towards innovations gained increasing ground. The concept of the national innovation system – referring to the totality of factors that influence the development and utilisation of new knowledge and expertise – was raised as the central organising concept of science and technology policy (Science and Technology Policy Council 1990; see also Miettinen 2002). The aim was to develop a broad framework for policies related to knowledge creation and diffusion, and, subsequently, the concept penetrated into various sectors of policy. Besides science and technology policy, it was also adopted as a main starting point in economic policy and national industrial strategy. Throughout the 1990s the concept was further elaborated in the state administration and there has been a strong commitment to it among civil servants as well as political decision-makers. Recently the concept of national innovation system has been gradually substituted by the concept of ‘innovation environment’ conceived primarily as the business environment of firms.

Although it is unclear to what degree the use of the concept of the innovation system has changed actual policy-making practices (Miettinen 2002), it has tended to reinforce the economic and commercial aspects in science and technology policies. This has taken place by putting the concept of innovation – instead of concepts like knowledge, science or research – at the centre of policy. In this respect, the key point is that the concept of innovation, ultimately, tends to refer to activities that are economically beneficial (Allardt 1995). Accordingly, an important consequence of this line of policy has been that a growing emphasis has been placed on the commercialisation of research in universities and research institutes. Universities have thus become actors in the innovation system and are expected to contribute to all phases of the innovation chain (e.g. Kutinlahti 2005).

The strengthening of technology policy during the 1980s and the subsequent adoption of the innovation system approach in the 1990s have thus emphasised economic objectives. The contribution to economic growth and the promotion of competitiveness have become increasingly central goals also in science policy and research activities in more general terms. This shift towards competitiveness and innovation-orientation is clearly visible for

instance in the guidelines of the Science and Technology Policy Council (Pelkonen 2006). Here there is a persistent line of policy since the 1970s that stresses growth in national investments in R&D, and the need to increase the internationalisation of research, raise the quality of Finnish research as well as promote postgraduate education. Alongside this rather stable line of argumentation, there was in the 1990s an increasing emphasis on the competitiveness and attractiveness of Finland, economic growth, and excellence, productivity and profitability of research activities.

Accordingly, technology and innovation policy has become ever more influential in government policies in general, and its objectives have also penetrated into various other areas, such as university policy (Kutinlahti 2005), regional policy (Häyrynen-Alestalo et al. 2006a) and health care (Tuominen 2007). This implies that other policy sectors are increasingly expected to contribute to innovation objectives (Kuitunen & Lähteenmäki-Smith 2006).

### **The broadening sphere of technology and innovation policy**

At the same time, however, both the sphere of operation and goals of technology and innovation policy have started to broaden. Although economic goals have remained primary, broader perspectives, such as environmental issues for example, have increasingly been linked to the technology and innovation policy framework. With respect to Tekes, the most important state agency funding technological development, the broadening of the objectives started in the 1990s. Representatives of Tekes describe this change in their interviews as follows:

“To put it roughly, our primary objective is economic benefit that produces jobs and tax revenue. In other words, we try to create prosperity and it is then others’ task to distribute it. But undoubtedly, environmental issues, as well as others, are integrated.” (A representative of Tekes.)

“We strive for welfare and employment, but our main target is competitiveness in the international markets. Our objective is that we [Finnish firms] can do better in the international markets – that’s where we meet the international competition – so that the added value of production increases. But as Tekes has grown, other societal values have also become more important. And that’s why we increasingly try to promote such issues as health, environment,

education, safety and so on. - - - It is a big challenge for us to determine how much emphasis we can put on these broader value targets and how much they count in respect to our primary goal which is growth and competitiveness. - - - While our core goal is still the same, these other values and goals are now much more pronounced than they were before." (A representative of Tekes.)

This change is also visible in the way Tekes describes its goals in its mission statement (Annual Reports of Tekes 1984–2007). Since its establishment in 1984 until 1992 Tekes' primary objective was defined as "to raise and maintain the technological level and to secure the international competitiveness of Finnish industry". In the early 1990s, the objective of increasing wellbeing was added to the mission statement. In the 1993 and 1994 mission statements, wellbeing was even raised the most important target: "the objective of Tekes is to promote the wellbeing of the society and stable societal development by raising directly or indirectly the capacity of Finnish industry for technological renewal." In the late 1990s, also the goal of increasing employment was integrated to the objectives along with competitiveness of Finnish industry and service sectors and growth of production and exports. In the latest Tekes' strategy (2008) wellbeing is one of three key objectives of Tekes' activity. Wellbeing is, however, considered as 'indirect' goal in the sense that it will be promoted through economic growth, technologies and innovations.

While the goals of Tekes' activities have broadened, also its sphere of operation has extended to new areas, such as the service sector and welfare and health care services. In the above-mentioned Tekes' strategy, for instance, wellbeing and health is raised as one of the key future themes by focusing on the development of the whole Finnish welfare society, and in particular welfare and health care services. The strategy emphasises that new modes of operation are needed in the public sector service production in order to meet the growing demand (Tekes 2008, 13). This seems to refer in particular to partnerships between public, private and the third sector, but also to the need to develop functioning markets in the welfare sector. Although not stated explicitly, this could imply an increasing opening of public social and health care services to market competition (cf. Tuominen 2007; Häyriinen-Alestalo et al. 2006b). The launch of the *Innovations in social and health care services* programme reflects well the current importance of

welfare and health care sector for Tekes' activities. The total budget of the programme will be 240 million euros for the years 2008–2015 which makes it one of the largest Tekes' programmes thus far.

To some degree, the broadening sphere of technology and innovation policy can also be seen in the guidelines of the Science and Technology Policy Council (as of January 2009 Research and Innovation Council) which directs and coordinates these policies at the highest level of decision-making. In its policy reviews, the Council has indeed made some references to the interfaces of technology and innovation policy with regional policy, employment policy and information society policy (e.g. Science and Technology Policy Council 2003). In the 1996 policy review, the Council discussed the relationships between science and technology policy and various other policy fields (Science and Technology Policy Council 1996, 49–51) and in the 2006 review the importance of horizontal relationships between policies are increasingly acknowledged (Science and Technology Policy Council 2006, 33–34). The main attention here is paid to education issues. Overall, compared to the broad field of operation of Tekes, the Council has, however, focused on a more narrow and traditional concept of science and technology policy.

The most visible initiative of the Council in this respect has been the introduction, in 2003, of the concept of social innovation to the policy framework. On the whole, the concept can be seen as an attempt to integrate the perspective of social development into the technology and economy-dominated frame of technology policy. However, the concept was not properly defined and social innovations were just considered as providing "impetus for social and cultural development" and as contributing to the "prevention of factors causing negative societal and social development" (Science and Technology Policy Council 2003, 6, 16). This has caused confusion in terms of the attempts to interpret and implement the concept (Hämäläinen & Heiskala 2004, 10). Overall, the consequence has been that social innovations have become a part of the vocabulary of technology and innovation policy. Many issues and renewal processes are currently termed social innovations, but it is uncertain whether more profound changes in the policy content have taken place.

### March of the concept of a broad-based innovation policy in the EU...

Following this broadening of the sphere and objectives of technology and innovation policy, also the concept of a broad-based innovation policy has politically broken through in the early 2000s. At the level of the European Union, the Commission published a document entitled *Broad-based Innovation Strategy for the EU* in September 2006 (European Commission 2006a) and in December the Council of the European Union laid down the strategic priorities based on the Commission's broad-based strategy (Council of the European Union 2006). The core of these guidelines is to promote culture supportive to innovation and turn the business environment more innovation-friendly:

"Europe has to become a truly knowledge-based and innovation-friendly society where innovation is not feared by the public but welcomed, is not hindered but encouraged, and where it is part of the core societal values and understood to work for the benefit of all its citizens" (European Commission 2006a, 3).

The strategy implies a move away from technology-oriented innovation policy towards emphasising non-technological innovations such as innovations in service sector and organisational innovation. Accordingly, there is also increasing attention to innovation in public sector services (Council of the European Union 2006). The role of the public sector in fostering innovation is also emphasised by encouraging the use of public procurement as a tool of innovation policy as well as by urging the creation of lead markets for innovative products. Furthermore, it is underlined that in order to create such a "true European innovation space", there is a need to engage all actors – business, the public sector, civil society organisations and consumers. It is believed that such a wide partnership will create "a virtuous circle where supply of new ideas and demand for new solutions both push and pull innovation" (European Commission 2006a, 3).

In terms of its goals, the broad-based innovation policy at the European level seems to be rather strongly oriented towards economic competitiveness: the innovation strategy is primarily considered as means to tackle the challenges of the global economy. Although increasing individual wellbeing, protection of the environment and challenges related to climate change are mentioned as sources of citizen concern and thus motives for innovation

policy, wellbeing is not emphasised as a goal in itself for innovation policy. In this regard, the comprehensiveness of the strategy relates primarily to promoting the framework conditions for innovation on a broad scale – such as education, internal market, intellectual property rights and standards – for the sake of economic growth. It thus largely adopts the model of a growth-oriented innovation policy and aspects of sustainable innovation policy are relatively marginal.

The European experience is worth to note here in particular for two reasons. First, as will be seen below, there are significant similarities between the new European innovation policy guidelines and the new Finnish innovation strategy that was prepared shortly afterwards. Second, Finnish policy-makers had a significant role in formulating the European guidelines. Prior to the Commission strategy, Esko Aho, who at that time was the president of Sitra, the Finnish National Fund for Innovation, had chaired an independent expert group nominated by the European Commission to present a view on how to reinforce EU's research and innovation performance (European Commission 2006b). The group urged the development of innovation-friendly markets in Europe which is largely reflected in the Commission's broad-based innovation strategy. In addition, the Council of the European Union conclusions and strategic priorities on the broad-based innovation strategy were largely formulated during the Finnish presidency of the EU in autumn 2006. This active involvement probably also explains, at least partly, the similarities between the strategies.

### ... and its adoption in Finland

In Finland, a new national innovation strategy was prepared during 2007–2008 (Ministry of Employment and the Economy 2008) and in October 2008 the Government presented a report on innovation policy to the Parliament, largely based on the national innovation strategy (Council of State 2008). These two documents raised the concept of a broad-based innovation policy to core of Finnish science, technology and innovation policy.

These documents relatively strongly adopt the perspective of a growth-oriented innovation policy: productivity growth is considered as the primary objective of innovation policy which should also lead to economic growth (and eventually also to

increasing wellbeing). Accordingly, also the concept of innovation is defined in the strategy in an economy-oriented way as “an exploited, competence-based competitive asset” (Ministry of Employment and the Economy 2008, 2). The perspective of sustainable innovation policy is relatively vague. It is stated, however, that the aim is that “economic growth is combined with the wellbeing of citizens and the environment” (ibid. 4). Furthermore, broad-based innovation policy and activity is considered as a means to tackle “social challenges” (ibid.), and is thus not developed uniquely in order to secure economic growth.

According to these documents, broad-based innovation policy is fundamentally *cross-sectoral* or *horizontal* as it focuses on a growing number of policy sectors and *systemic* as it requires a comprehensive approach and extensive transformation processes instead of a variety of individual and separate policy instruments. Such a systemic view is considered necessary, for instance, in solving various environmental problems, in turning public services more efficient and in building regional innovation centres. In this regard, the documents strongly adopt the growth-oriented innovation policy approach as it is proposed that “the innovation perspective will be introduced as a leading idea throughout the steering and operations of all public sector fields” (Ministry of Employment and the Economy 2008, 40). Key policy sectors which the broad-based innovation policy will focus on are social and health care, energy, transport, information society, education and regional development. In addition, the development of working life is introduced as a new area of innovation policy.

Of these sectors, particular attention is paid to education as broad-based innovation policy will focus on the whole educational system with the goal of providing Finland with a learning environment which is “motivating innovation on a broad basis” (ibid. 31). Along the lines of growth-oriented innovation policy, this implies, among other things, that the “encouragement of entrepreneurship, creativity and innovation will be included in the curricula of all stages of education”. Although one cannot deny the importance of promoting creativity in schools, it however seems somewhat exaggerated to emphasise issues like innovation and entrepreneurship while there seem to be more profound problems in the Finnish school system. For instance, there are important signs that pupils do not like it at school. According to a study conducted by the

World Health Organisation, only around 10 percent of 11–13-year-old Finnish pupils reported that they like school a lot (Samdal et al. 2004, 44). For 15-year-olds the corresponding figure was around 4 per cent. When compared to 33 countries, Finland had the lowest figures both for 11-year-olds and 15-year-olds. For instance, the corresponding figures for Norway were around 42 percent for 11–13-year-olds and 30 per cent for 15-year-olds. Accordingly, it seems that while the Finnish schools system produces good learning results according to the PISA studies (OECD 2007), there are some problems related to how pupils experience the school. This aspect was also raised up in the Parliamentary discussion on innovation policy where also the equality and diversity of the school system was emphasised:

“We greens want to underline that the comprehensive school and the opportunities for studying and hobbies should be equal for all children and the young. - - - We must put an end to school bullying. - - - We have to make investments so that pupils enjoy their time at school”. (Group speech, Green Party, MP Karimäki)

In terms of new policy approaches, the strategy aims to add demand and user orientation as an entirely new element to Finnish innovation policy along with traditional supply-side measures. Accordingly, there is a need to pay increasing attention to consumer and customer needs in innovative activity and also related policy has to take this into account. In practice it implies that open innovation models will be supported, public procurement will be used to promote innovation and attempts will be made develop lead markets in selected fields. Furthermore, as in the EU innovation strategy, broad-based innovation policy in Finland will increasingly focus also on public sector activities: “also the public sector will have to renew its service systems and modes of operation actively by promoting innovations” (Council of State 2008, 13). According to the new innovation policy framework, the Finnish public sector should become active developer, applier and user of innovations. In the Parliamentary debate, this approach was also broadly supported by all parties. The Left Alliance, however, considered that the report is based on a “clichéd” understanding of the public sector inefficiency. In this regard, also the Green Party emphasised that for instance in social and health care services – where a lot of expectations are currently placed in terms of increasing use of innovations – productivity

cannot be raised in a similar manner as in other sectors of production. In addition, they maintained that it should be recalled that machines and electronic services will not replace people and human interaction which are central in these services.

### **BROAD-BASED INNOVATION POLICY: ADMINISTRATIVE AND POLITICAL CHALLENGES**

#### **Balancing the various goals of a broad-based innovation policy**

As has been examined above, the goal-setting of technology and innovation policy has broadened over time as such targets as welfare and environmental issues for instance have been included in the policy framework. Yet, productivity and economic growth still remain as the primary targets of innovation policy. Human wellbeing and sustainable development are considered, roughly put, as side-effects of economic targets. Recent attempts to formulate strategies of broad-based innovation policy, in Finland and in the European Union, do not radically change this picture of growth-oriented innovation policy.

The concern over the welfare dimension of the emerging broad-based innovation policy was also raised in the Parliamentary debate. The parties in the opposition, in particular the Social Democratic Party, the Left Alliance and the Christian Democrats, criticised the report for focusing too much on economic issues: they emphasised that innovations create structural changes which also have negative side-effects such as lost jobs and income as well as need for adjustments. Innovation policy should take a broader responsibility in this respect and strive to increase human wellbeing instead of productivity growth and economic competitiveness.

"In our view, the strategy is very much economy-driven. Innovation policy should be integrated with science policy, education policy and social policy. For instance, solving mental health problems of the youth urges social innovations. - - - Innovation policy is here presented as a means to respond to globalisation. Social democrats want to secure life worth human dignity in the midst of this transformation." (Group speech, Social Democratic Party, MP Lipponen.)

"Increasing productivity must not be a goal that is pursued at the expense of a life fit for a human being

and quality of life. - - - Commercial and societal exploitation of innovations are emphasised in the report. Use of innovations in the social area in terms of promoting quality of life is left aside." (Group speech, Christian Democrats, MP Rauhala)

"I am not able to find any discussion on social cohesion in this report". (Group speech, the Left Alliance, MP Yrttiaho)

At least thus far, Finnish innovation policy has lacked a systematic balancing of objectives and perspectives of innovation policy with the goals of other policy domains (see also e.g. Pelkonen 2006). Furthermore, also the concept of social innovation tends to be insufficient to capture the broad social dimension related to science, technology and innovation including issues like wellbeing, equality, participation and democracy. Such questions cannot be covered by focusing on social innovations and in this respect complementary perspectives are needed.

However, as the broadening of the sphere of innovation policy inevitably integrates new policy sectors and their goals to the policy framework, the question of balancing and integrating the goals will become increasingly topical. If such an integrative approach is not adopted, it may be that the expansion of innovation policy will simply imply a unidirectional transfer of its primary targets – such as productivity, efficiency, and creating new markets and business opportunities – to new sectors to which they may not be adaptable. Although it still is somewhat unclear to what degree this is taking place, examples of such transfers are already visible. For instance, in health-related innovation policy, contradictions have emerged due to the dominance of the goal of promoting business vis-à-vis the goal of improving the health service system and its cost-effectiveness as a whole (Häyriinen-Alestalo et al. 2005, 130–133). Similarly, with respect to regional development, the growing integration of regional and innovation policies has implied that the goal of economic growth and competitiveness has become increasingly promoted over the goal regionally balanced development (e.g. Pelkonen 2008a). Accordingly, the question of to what extent other policy sectors can be reasonably adapted to the promotion of innovation thus is becoming a fundamental issue for broad-based innovation policy in the near future (cf. Lundvall & Borrás 2006, 613–614).



## Horizontal coordination

In practical terms, the balancing of the economic and welfare targets would require a strong capability for horizontal collaboration across policy sectors from the government, ministries and various state agencies involved in innovation policy development. Furthermore, horizontal coordination is not only needed to balance the goals, but also in order to secure that different policies and measures “work together” and that they are not in conflict with each other but rather make a coherent whole. Given the expanding sphere of innovation policy, need for policy coordination will inevitably increase.

In the Finnish innovation policy system, policy coordination across the state administration has largely been on the responsibility of the Science and Technology Policy Council. At the level of ministries, there are, naturally, various kinds of collaboration, and as a matter of fact, there has been growing cooperation between the Ministry of Trade and Industry/Ministry of Employment and the Economy and the Ministry of Education in questions related to science and technology policy (Pelkonen et al. 2008). On the contrary, however, in issues related to education policy, coordination between the two ministries has not been that strong. Similarly, at the agency level, Tekes, the Academy of Finland and Sitra, the Finnish Innovation Fund, have also substantially increased their collaboration. In the context of a broad-based innovation policy, however, coordination of innovation policies will need to extend to various other ministries, policy sectors and agencies as well.

As mentioned above, with respect to the policy content, the Science and Technology Policy Council has paid attention to the perspectives of various other policy sectors in its reviews, but in practice it has not taken a strongly comprehensive and integrative approach. The case of sustainable development policy provides one example of this. While the Council has made references to environmental issues in its guidelines, the members of the Council maintain that environmental questions have not been very much addressed in the Council's actual work. As a matter of fact, there seems to be lack of interaction between science and technology policy and environmental policy (or sustainable development policy) at the agenda-setting level (Hjelt et al. 2005).

“If we think about environmental aspects, such horizontality has not been discussed there very much” (A member of the Science and Technology Policy Council).

“There are different emphases on how broadly we look at the innovation system; is it just investing in the development of technology or do we take, or how broadly do we take, social implications, ecological implications into account” (A member of the Science and Technology Policy Council).

From the perspective of broad-based innovation policy and the related need for horizontal collaboration, also the operating model of the Science and Technology Policy Council is problematic in two respects. First, its influence is mainly limited to core science and technology policy administrations while it does not have a similar position with respect to other sectors, even in terms of research-related issues. The Council thus has relatively limited possibilities to coordinate activities across the state administration. Second, although the Council has a broad line-up<sup>1</sup>, it is problematic that important policy sectors from the perspective of research and innovation have been lacking representation in the Council. For instance, until 2008 the minister responsible for regional development<sup>2</sup> had never been appointed as a Council member, and ministers responsible for social and health policy and agricultural policy have very rarely been nominated to the Council. Furthermore, the role of those sectoral ministers who have been appointed to the Council has been rather marginal in terms of participation in the Council's work. The Council's mode of operation hence remains closely tied to the administrative branches of the Ministry of Employment and the Economy and the Ministry of Education.

In the new national innovation strategy, two institutional reforms were proposed in order to enhance horizontal coordination and steering of innovation policy. First, the Science and Technology Policy Council was proposed to be replaced by a Research and Innovation Council which would be broader both in terms of its tasks and composition. Also the resources and expertise of the Council's secretariat would be enlarged. While the need to broaden the composition and tasks of the Council has already been brought forward in academic discussion (see Pelkonen 2006), it now seems to move into practice: Given the coordination requirements of a broad-based innovation policy, such reform indeed seems necessary. In particular, it

would be important that all key sectors in terms of innovation activities are concretely integrated to the work of the Council and that they would have a solid possibilities to participate in formulating the innovation policy guidelines. This would lead to enhanced interaction between the policy sectors and also innovation policy would need to take into account the perspectives and goals of other policy sectors. In January 2009, the Council's name was indeed changed into Research and Innovation Council but no substantial changes were made at this point.

Second, it was proposed to expand the Cabinet Committee on Economic Policy<sup>3</sup> into a Cabinet Committee on Economic and Innovation Policy which would "act as the forum for the state consortium's strategic management" as well as "provide extensive cover for issues pertaining to the promotion of the exploitation of innovation activity" (Ministry of Employment and the Economy 2008, 44). It is interesting to note that this proposition has appeared every time when the institutional organisation of Finnish science, technology and innovation policies has been under discussion during the last 15 years but thus far nothing has been done to reorganise the Committee. The aim is to create a better path from discussion and preparation at the level of experts and ministries to the political level and to the government. This is related to the fact that Finnish political decision-makers have been relatively passive with respect to science, technology and innovation policies. As a consequence, policies and programmes have been prepared in a strongly expert-driven way without political discussion.

### **Legitimacy and public participation**

The weak participation of politicians and political parties and the orientation towards expert-driven decision-making in technology and innovation policies has implied that the decision-making system has remained rather closed, for instance with respect to civic organisations and other inputs outside the established corporatist policy-making circles. In innovation policy decision-making, formal parties have been the central actors: representatives from key ministries and state agencies (in particular the Ministry of Employment and the Economy, the Ministry of Education, Tekes and the Academy of Finland), high tech firms, universities and research

institutions as well as labour market organisations. Such a closed model of decision-making may, however, be in conflict with the expanding scope of a broad-based innovation policy and it could be increasingly questioned in the near future.

Indeed, there have recently been some indications of increasing integration of non-governmental organisations into biotechnology policy (Rask 2008) and information society policy (Pelkonen 2008b). Also during the preparation of the new national innovation strategy, an open online consultation was used in which over 500 persons participated. Overall, the Finnish decision-making model could, however, largely be defined as 'exclusive corporatism' as distinct from more inclusive forms of corporatist decision-making like in Norway (Kallerud 2004) or more participatory or deliberative forms of governance like in Denmark (Bertilsson 2004). The issue of public participation in decision-making has thus not become an important concern in Finnish science and technology policy. Instead of attempting to bring the public closer to technology policy decision-making, educational and market-based forms of governance have been characteristic of Finland (Häyrynen-Alesto et al. 2004). On the one hand, there have been efforts to educate and convince citizens so that they understand the benefits that the adoption of new technologies brings. This has been evident, for instance, in national information society strategies in which citizens are encouraged to educate themselves, continuously learn new things, take increasing responsibility and, in particular, learn to use new ICT devices in order to be active members in the information society (Pelkonen 2008b). On the other hand, citizens have been regarded as consumers of technological devices and products who express their will through actions in the marketplace (Snell 2002).

Yet, as the sphere of innovation policy expands and an increasing number of issues and areas come to be linked with it, there is also a growing need for enhancing the legitimacy of the policy. Currently the strategies of broad-based innovation policy emphasise the integration of users into innovation processes, but they ignore the need to engage political decision-makers and integrate citizens and non-governmental organisations into decision-making processes. As it is unclear how non-governmental organisations' and citizens' voice could best be integrated to the decision-making processes (Kuitunen & Lähteenmäki-Smith 2006), stimulating

and enhancing public and political discussion on key innovation policy issues and priorities could provide 'first aid' for the matter. The need for public engagement was also called for in the Parliamentary debate:

"The success of innovation policy requires that the creativity of all citizens will be taken into use and that citizens feel that they are engaged in this policy" (Group speech, Social Democratic Party, MP Lipponen.)

Furthermore, also the emergence of various ethical questions and growing public concern related to the societal and environmental impacts of certain new technologies add to the need of public participation. This has already taken place in many countries, and to a limited degree also in Finland, in particular with respect to recent developments in biotechnology. For instance, questions related to the increasing commercial use of tissue sample collections and other types of biobanks (see Tupasela 2008) tend to call for public discussion and engagement. Given the dominance of a growth-oriented approach to innovation policy, such issues will become increasingly salient in the future.

## CONCLUSION

Across advanced industrial countries, science, technology and innovation have come to play an increasingly important role among state policies as governments aim at fostering knowledge-based economic growth. Both in the European Union and in Finland, policies in this area are currently being transformed into a broad-based innovation policy. This article has analysed the policy transformation in Finland and paid special attention to the changes in the goal-setting of the policy, in particular by looking at how and to what degree other goals than economic growth and competitiveness have been integrated into the policy framework. In addition, the article has identified three administrative and political challenges related to the emerging framework of a broad-based innovation policy.

Overall, the development towards a broad-based innovation policy provides important opportunities for enhancing both economic and social development. In terms of economic development, it promises to open up new business possibilities and turn activities more efficient. In terms of social development, it could, for instance, provide better public services, enhance the conditions in working

life and protect the environment. Yet, although welfare and environmental targets have been brought into the policy framework, the new broad-based innovation policy largely adopts the perspective of a growth-oriented innovation policy in which economic competitiveness and productivity growth are the central objectives. The first challenge, thus, concerns the adoption of a more comprehensive approach to innovation, here discussed in terms of sustainable innovation policy, in which well-being, human development and sustainability would become central goals of the policy. In such a view, creating technologies and innovations that are primarily focused on increasing human well-being would be placed at the core of the policy. Given the growing importance and the broadening sphere of innovation policy, however, the need for balancing the goals of innovation policy will become increasingly salient in the future.

Secondly, a related challenge for broad-based innovation policy is horizontal coordination. Broad-based innovation policy will touch upon an increasing number of policy sectors which lead to a need to enhance collaboration and coordination across the state administration. Overall, horizontal collaboration is a significant challenge for state administration in virtually all countries and the Finnish state administration has not been an exception in this regard. With respect to innovation policy, horizontal coordination has largely been on the responsibility of the Science and Technology Policy Council which has, however, had important limitations in this regard. It will be interesting to see whether the proposed changes in the Council's structure and tasks will in practice increase its capacity for horizontal collaboration.

Third important challenge concerns the legitimacy and public participation related to the emerging innovation policy paradigm. Both the broadening sphere of the policy as well as an increasing number of ethical questions related to new technologies and innovations tend to call for broader public discussion related to these developments. Thus far such discussion has been limited in Finland.

## NOTES

<sup>1</sup> The Council is chaired by the Prime Minister and its members include Ministers of Education, Economic Affairs and Finance and maximum four other ministers. In addition, there are up to ten other members in the Council representing key actors and stakeholders of the innova-

tion system such as the Academy of Finland, Tekes, universities, industry and labour market organisations

<sup>2</sup> Along with the establishment in January 2008 of the Ministry of Employment and the Economy the responsibility for regional development shifted to the Minister of Economic Affairs who has a permanent seat on the Council.

<sup>3</sup> The Committee is the government's central preparatory body in issues related to economic development and public finance.

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