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# COST Action E51

## Policy Integration and Coordination: the Case of Innovation and the Forest Sector in Europe

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# Policy Integration and Coordination: the Case of Innovation and the Forest Sector in Europe

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# EXECUTIVE SUMMARY

The book "*Policy Integration and Coordination: the Case of Innovation and the Forest Sector in Europe*" deals with the questions of how the concept of innovation is integrated into policies that are relevant for forestry and forest-based industries, and how these policies are coordinated. These questions are also at the core of the COST Action E51 on "*Integrating Innovation and Development Policies for the Forest Sector*", which was carried out from 2006 to 2010 with the participation of approximately 40 research institutions from 20 countries. This COST Action studies innovation policies and processes in the forest sector at two levels: the policy level; and the level of innovation processes on the ground. This book presents the main outcomes from the policy level by analysing the seven policy fields that have the strongest influence on the innovation activities in the sector: forestry policy, forest-based industries policy, innovation policy, rural development policy, regional development policy, sustainable development policy, and renewable energy policy. This broad selection of policy fields was made in order to cover all the principal innovation fields in forestry and forest-based industries. The COST Action E51 examined two broad fields of innovation: (a) territorial goods and services associated with forests, and (b) wood value chains.

The main focus of this book is a comparative analysis of the central policy documents from the seven above-mentioned fields in 19 countries. The data were collected through a common questionnaire completed by expert teams from those countries that participated in the Action, namely, Austria, Bulgaria, Switzerland, Cyprus, Czech Republic, Germany, Estonia, Finland, France, Croatia, Italy, Lithuania, Norway, Poland, Portugal, Romania, Slovakia, Sweden, and Scotland (as a part of the UK). These standardised assessments of national policy documents are complemented by a more detailed analysis of selected policy areas: the EU Rural Development Programme as well as the Strategic Research Agenda and National Research Agendas of the European Forest-based Sector Technology Platform (FTP).

The results show that innovation has become an issue in, and is recognised by, most policy fields that are relevant for forestry and forest-based industries. The concept of innovation, however, is often used rather symbolically, without appropriate or substantive measures. There is a trend in most policy documents to describe the issue of innovation support from a systemic view; however, the measures often come from the traditional innovation support toolbox. While the traditional science and technology approach follows an understanding of innovation as a linear process from R&D to the market, a systemic innovation policy approach sees innovation as a complex process in an environment of multiple actors and institutions. Traditional innovation support focuses on public and private R&D, but systemic measures also address knowledge transfer, interface management or learning processes. In the forest sector, innovation policies mainly support diffusion of new technologies in timber production and processing. The support of radical innovations, learning or goods and services other than wood, is rare. Although innovation has been recognised as a policy goal, the forest sector has thus remained largely traditional. A similar gap between formal goals and informal practice is found in the coordination of actors. All of the studied policy documents claim to be well coordinated with other sectors; the detailed analysis, however, reveals that effective coordination of the relevant policies is often lacking.

Innovations in the forest sector do, all in all, address current societal challenges, e.g. in the fields of bio-energy and recreation. At the same time, it seems that a number of blind spots exist: environmental services such as biodiversity conservation, drinking water production, protection against natural hazards and health-related or spiritual services are only recognized to a minor extent. Possible future markets such as sustainable construction (with wood), or bio-based

products (food or chemicals) could be pursued much more strongly in the sector. As a general picture, it seems that radical innovations are developed more outside the traditionally defined forest sector than within it. The forest sector seems more active in diffusion than in supporting the development of novelties in the first place.

The delivery of support systems for innovation in the sector is not easy: territorial goods and services need specific policies because of their cross-sectoral and public good characteristics. Policies need to enable the development of local networks and partnerships that develop innovation. In addition, wood value chains need specific policy measures because of the prevailing micro-, small-, and medium-sized, as well as, family-run enterprises that are located in rural areas. For their support, specific policy means and innovation infrastructures are needed on the local-regional level, oriented towards traditional sector SMEs.

Rural development policy (RDP) is strongly targeted at the agricultural sector and not at the rural economy as a whole. The EU RDP measures that relate to forestry largely lack innovative approaches. The LEADER instrument is one policy approach that is promising in terms of systematically and systemically supporting innovation processes in rural areas and in bridging territorial and sectoral goals and approaches.

The FTP had a significant impact in promoting the topic of forest sector innovation. The establishment of the FTP Vision 2030 and the Strategic Research Agenda (SRA) initiated policy reforms on national level. While the SRA, however, aimed at broad innovation support and broad involvement of stakeholders, the development processes of the FTP National Research Agendas (NRAs) mostly included only those stakeholders that were closely linked to forest-based industries.

We conclude that policies are increasingly using systemic innovation support and coordination rhetoric, but substantive measures are often lacking. The change in language may, however, be the first step in a policy change towards an integrated and sustainable development of the sector. The following policy measures would be needed as further steps to strengthen sustainable innovation processes in forestry and forest-based industries:

- To raise awareness for the importance of integrated innovation for a sustainable development of the forestry and forest-based industry sectors, and for a stronger contribution of the sector to the sustainable development of society;
- To further develop and strengthen systemic strategies and measures to support innovation in forestry and forest-based industries;
- To foster transnational learning through cross-border interlinkages in the policy, administration and business spheres;
- To support cross-sectoral interaction on all administrative and practice levels: European, national and local, and in both innovation fields: (a) territorial goods and services, and (b) wood value chains;
- In order to support innovation in territorial goods and services, specific policies are needed that support diversification, local networks, new ideas, cross-sectoral interaction and bottom-up initiatives;
- In order to support innovation in wood value chains, specific policy means and infrastructures are needed on the local-regional level to support micro or small-sized, and family-run rural businesses.

# FOREWORD AND ACKNOWLEDGMENTS

This book is the outcome of the COST Action E51 on "*Integrating Innovation and Development Policies for the Forest Sector*", which studies innovation policies and processes in the forest sector in Europe. In its first phase, it analysed how innovation is integrated into policies that are relevant for innovation in the sector. With an account of the fact that the forest sector is influenced by so many policy fields, besides for forest policies, it compared policies from seven fields: forestry policy, forest based industries policy, innovation policy, rural development policy, regional development policy, sustainable development policy, and renewable energy policy. The COST Action that supported the co-operation of researchers from more than 40 organisations enabled data collection on national policies from 19 countries, all based on a common guideline. This opportunity was used to systematically compare central policy documents from seven policy fields across those respective countries. The results from this unique comparison are presented in the core of this book. This is accompanied by a theoretical introduction as well as a more detailed analysis of two policy fields that play a crucial role in the support of innovations in the sector: the EU Rural Development Programme and the policies of the European Forest-based Sector Technology Platform. These policies are important for two different innovation fields that are dealt with in the Action: (a) territorial goods and services of forests, and (b) wood based value chains. The conclusions give a number of insights into how policies actually support innovation activities in the sector, but also a number of gaps and recommendations. The book chapters have undergone an internal reviewing process. We hope that the results will be valuable and inspiring for policy-makers as well as researchers.

The book is the output of phase 1 of COST Action E51. Phase 2 focuses on innovation processes on the ground. It complements the analysis of the policy documents that was largely restricted to the formulation of the policies. In phase 2, detailed case studies examined numerous concrete and currently important innovation fields that span from timber construction to bio-energy, carbon sequestration and recreation. These results will be published in the final book of the COST Action in 2010/11.

The book at hand is essentially the product of more than 50 researchers that were active in the framework of COST Action E51. The idea for the Action goes back to Ewald Rametsteiner in his function as the leader of the EFI PC INNOFORCE, which is a project centre of the European Forest Institute that particularly focuses on the study of innovation in forestry and the forest sector. He initiated the COST Action and chaired it until June 2009 when he left for a new position. Gerhard Weiss who had worked alongside him took over the coordination of the COST Action – and with this, the editing of this book. Many thanks go to all of those who participated in the Action and who contributed to the data collection in the country reports! Their names are visible in the country reports and are also available on the COST Action website http://www.cost.esf.org – and here: A. Bauer, G. Berger, K. Kubeczko, E. Rametsteiner, G. Weiss, E. Kitchoukov, N. Stoyanov, M. Stoyanova, S. Posavec, M. Šporčić, A. Pirc, T. Starčić, L. Pudivitrova, V. Jarsky, K. Ventrubova, L. Sisak, P. Ollonqvist, A. Niskanen, M. Kajanus, A. Matilainen, P. Mäkinen, H. Vihinen, T. Rimmler, S. Mynttinen, R. Volk, R. Toivonen, A. Horattas, D. Mizaraite, S. Mizars, M-C. Belis-Bergouignan, G. Buttoud, C. Chauvin, E. Le Net, M. Böcher, F. Ebinger, P. Elsasser, E. Kastenholz, F. Setzer, B. Vennesland, T. E. Pedersen, J. Barstad, C. Nastase, G. Duduman, L. Bouriaud, L. Padureanu, D. Bancu, Z. Karaszewski, P. S. Mederski, W. Strykowski, A. M. S. Carvalho Mendes, D. Feliciano, J. Šálka, Z. Sarvašová, R. Šulek, L. Cesaro, L. Secco, D. Pettenella, F. Carbone, L. Ciccarese, P. Foglia, T. Nord,

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Finally, we would like to thank the officers at COST that facilitated the work in the Action as well as the publication. We appreciate their friendly and constructive support of our work, which was certainly not always easy.

Joensuu, Rome, Aberdeen, Vienna

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Action E51

# Policy Integration and Coordination: the Case of Innovation and the Forest Sector in Europe

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Chapter I

# Integrating Innovation and Development Policies for the Forest Sector – An Introduction

Ewald Rametsteiner

Economists have for decades struggled with the need to explain how economies grow. The absence of a theoretical body to fully explain GDP growth within mainstream theories was painful, as economic growth is the driver of employment and income and it is a major factor of well-being. This in turn is basically the core objective of economic policy making. In the late 1980s and early 1990s innovation was identified as the key driving force behind economic growth. It is by now widely accepted that innovation is a central element of economic performance and competitiveness. Baumol (2003) goes even further by putting competition over innovation, not over price, at the centre of the market economy system. Innovation competition is thus seen as the core of the capitalist system of wealth production.

What is innovation? Basically, innovation means "...a new way of doing something". The OECD (2005) defines innovation as "[…] the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations". Both definitions indicate the fuzziness of the borders of what to call an innovation from a mere modification, which remains a concern, particularly for measuring innovation, innovation performance, and effects of policy interventions in innovation processes.

While there is a general understanding of the importance of innovation as a concept and an activity in both business and policy circles, neither innovation processes are well understood, nor is it clear which kind of policies are most effective in encouraging innovation and how to integrate innovation policies in the wider policy setting. Thus, despite the strong political interest in innovation and innovation supporting policies, innovation related research still leaves many questions open. This is despite the fact that general innovation research has made considerable progress during the 1990s, with a shift from a linear understanding of innovation to a more complex systemic view (Edquist, 2004). This follows from the empirical observation that firms rarely innovate alone. Innovation often requires firms to interact with other agents, including input suppliers, consumers, and competitors. Furthermore, as proposed by Lundvall (1992), in the 'systems approach to innovation', innovation is supported by socio-economic, political and cultural, research and education, and financing systems, and the quality of regulation, among others.

## 1. Why have an innovation policy and what is it?

With the increasing recognition of the importance of innovation for economic development there was a parallel rise in efforts to devise policy means to support innovation, based on different concepts, and based on different rationales.

In many instances policy measures directly or indirectly address innovation processes, either explicitly or implicitly. Wherever supporting innovation processes or performance is an explicit goal of government policy, one can speak of an "innovation policy", which can be defined as a plan of action to guide decisions and actions with a view to influence innovation processes or performance. The objectives of innovation policy are often economic ones,

such as economic growth, productivity growth, increased employment and competitiveness, and directed at promoting innovation by firms. However, they may just as well concern any other organisation or area of desired improvements, including cultural, social, environmental, or political.

Two different types of failures are usually used to justify policy intervention: market failures and system failures. The market failure rationale is grounded in neo-classical and welfare economics, while system failure rationales became more prominent with the increasing empirical recognition of the systemic nature of many innovation processes as emphasized is evolutionary economics or social system sciences.

Market failures can occur due to the existence of a number of factors, of which the following are frequently named:

(a) Externalities and spillovers,
(b) Imperfect and asymmetric information,
(c) Network or coordination failures, and
(d) Market power.

Market failure related to positive externalities and spillovers causes firms to under invest in innovation activity, e.g. research and development (R&D), as they are not able to appropriate the full benefits of these investments. In other words, companies will under-invest in R&D because they are unable to keep all the benefits from these investments to themselves. According to this line of thinking, R&D results in technological knowledge with public good characteristics: it is non-rivalrous and non-excludable. Thus, other firms can benefit from (some of) the R&D efforts at no cost by incorporating new ideas in their own products and processes (knowledge spillovers).

If firms cannot appropriate the whole increase in surplus for consumers that results from the innovation, this results in rent spillovers to consumers. In other words, the social rate of return of an innovation is higher than the private rate of return of the innovator. As a consequence, firms under invest compared to the societal benefit that would emerge if they did. According to Oxera (2005) technological or knowledge spillovers are more likely to occur (1) the more general the knowledge created by the innovative activity, (2) the more unlikely it is that the inventor can appropriate all of its effects, and (3) the easier it is to transfer knowledge between agents. Appropriating the results of an innovation is more difficult (1) the more difficult it is to codify the knowledge, and (2) the easier it is to transfer such knowledge.

The market failure argument related to externalities and spillovers has been most commonly evoked as justification for subsidizing R&D, for promoting public sector R&D, as well as for creating intellectual property rights (IPR) protection regimes. All these policy measures are designed to help the innovating firm deal with spillover issues. These instruments form the traditional core of science and technology policies, including interventions such as managing the science base and designing financial incentives to industrial R&D.

Market failures resulting from imperfect and asymmetric information are often related to information about market opportunities, available technologies, and other relevant knowledge, including from existing research or finance. Coordination or networking failures concern the (in)ability of companies to coordinate or interact, and so develop and deliver innovation. Such failures can be a consequence of many aspects, including awareness, cultures, firm sizes, R&D project size, complexity, the dependency of firms to interaction, and risk. Market failures resulting from market power are likely to occur in product markets, e.g. where limited competition impedes innovation, with related barriers to entry due to existing market structures, or where excess competition impedes innovation.

Parts of the market failure rationale can be found in systemic failure rationales. In systemic “evolutionary” economic theories technological advance and innovation is characterised by constant interplay and mutual learning between different types of knowledge

and actors. Seen from a micro-economic perspective, innovation is a learning process, which is gradual and cumulative in character. Innovation performance is therefore not only dependent on how specific firms perform but also on how they interact with each other and with other organisations, such as universities and R&D-institutes, business support services, and other elements of a knowledge and innovation generating system. If these different organisations that are needed to create and assemble knowledge interact poorly, the rate and quality of innovations may be poor. Such mismatches between elements in an innovation system are one major type of systemic failures, which was listed under the market failure rationale as “network or coordination failures”. Another failure considered of key importance in systemic failures is imperfect information. Asymmetric information, however, is taken as a constitutive element of systems, contrary to the neo-classical school, which holds that “perfect information” to be one of its central points of departure of a working market system, and which thus classifies asymmetric information as a market failure.

Systemic approaches identify partly similar issues as neo-classical economics, but draw different lessons as regards the underlying reason and apply different policy measures to address the issue. Where neo-classical approaches put considerably more weight on the individual market actors (firms), systemic approaches address both non-market and market actors and in particular emphasize the interaction between these “system elements” to promote flow of information and knowledge. Systemic innovation policy therefore becomes a much more complex issue than in the market failure rationale. Systemic knowledge and innovation policies are about facilitation, i.e. developing the right framework conditions for the emergence of new knowledge, technology and innovation opportunities.

Gustafsson and Autio (2006) identify four types of system failures: (a) the sub-optimality in the adaptation of innovation structures, where firms are locked into prevailing systems and find it difficult to break away from these systems to pursue new knowledge or to establish new collaborations, (b) the lack of actor interactions and functions bridging knowledge production and knowledge use, (c) the sub-optimal lock-ins by implementing actors, e.g. due to institutional, social or technological relation commitments, and (d) the lack of supportive structures for innovation. Being locked in on a sub-optimal path of development, and locked out from more promising ones, such production systems tend to enforce exploitation rather than exploration.

According to systemic failure rationale of government intervention, there must thus be a 'systemic problem' which cannot be solved by either the actors or the market forces. Policy intervention is justifiable in areas where the system is not functioning well. According to Edquist and Johnson (1997) what needs to function in an innovation system to induce firms to innovate are (a) the reduction of uncertainties by providing information; (b) the management of conflicts and cooperation; and (c) the provision of incentives.

Smits and Kuhlman (2004), amongst others, use a somewhat different classification of functions that “innovation systems” should fulfil and deduct systemic policy instruments from these. They distinguish between the following functions:

- management of interfaces between actors and subsystems (such as the market system within which firms operate and the knowledge production system within which research organisations operate): overcoming borders, superseding tunnel visions and dead-locks of narrow negotiation arenas, stimulating the debate.
- building and organising (innovation) systems: facilitate construction and deconstruction of (sub) systems, initiate discourse, alignment, consensus; prevent lock-in, identify and facilitate prime movers and ensure that all relevant actors are involved.
- providing a platform for learning and experimenting: create conditions for various forms of learning such as: learning by doing, learning by using and learning by interacting.

- providing an infrastructure for strategic intelligence: identify new knowledge sources, build links between sources, improve accessibility for all relevant actors, and stimulate the development of the capacity to produce strategic information tailored to the needs of actors involved.
- stimulating demand articulation, strategy and vision development: stimulate and facilitate the search for possible applications, develop instruments that support discourse, vision and strategy-development.

A third type of failures to note is government failure, which is the public sector analogy to market failure. Government failures occur when a government intervention causes a more inefficient allocation of goods and resources than would occur without that intervention (active failure). It can also be considered a government failure if no intervention takes place where a market failure is not addressed, resulting in a socially inefficient allocation of goods and resources. Thus, for governments to intervene, net societal benefits need to exceed opportunity costs and costs of distortions due to the intervention.

Just as with market failures, there are different types of government failures that describe corresponding distortions. For example, Weisbrod (1978) has classified government failures into legislative, administrative, judicial and enforcement failures. Finally, state intervention almost invariably creates wealth transfers which provide individuals and groups with strong incentives to engage in "rent-seeking" activities which generate social waste rather than social surplus. Further distortions include crowding-out effects due to the government intervention, inelastic supply of government-controlled resources and other inefficiencies in implementation, and a lack of information and opportunities for "rent-seeking" due to asymmetric information or biased rules favouring elites. Proponents holding that government failures are likely to occur, or that market or system failures, where existing, can be corrected by these systems without explicit governmental interference usually support the proposition that innovation is a completely private sector issue and policy shouldn't interfere.

## 2. Why innovation policy integration and coordination?

Innovation policy has considerably changed over the last decades, in line with the growing empirical evidence of the importance and complexity of innovation processes. The first generation of innovation policy was based on the idea of a linear process from basic research via applied research to commercial applications (Lengrand et al. 2002). There is a distinct role for education/university ministries, considering innovation as the expected end of the Research and Technology Development (RTD) process, and economy/industry ministries dealing with innovation as a tool for encouraging investment and modernizing SMEs. As a consequence, the emphasis of policy was on fostering critical directions of scientific and technological advance (by the ministry responsible for science), and enhancing applied research and commercial applications (by the ministry responsible for industry). Integrating innovation into existing policies, and co-ordinating related policies in such an administrative setting is needed, but comparatively simple.

Second generation innovation policy (Lengrand et al. 2002) recognises the complexity of the innovation system, with many feedback loops between the different "stages" of the innovation process. It also gives more recognition to the generation and diffusion of innovations within "innovation systems". Policy seeks to enhance two-way communication across different points in the innovation "chain", and to improve innovation systems in ways that can better inform decisions about research, commercialisation, technology adoption and implementation, etc. Many, including market and non-market actors, are involved in this process. Each governmental body or agency has its own objectives and innovation related policies and measures. Not only need these bodies promote communication and coordination amongst those firms involved in the innovation

process, they would be asked to properly integrate and coordinate their innovation and development related policies themselves, both vertically across hierarchies of ministries, departments, and agencies, and horizontally across different ministries and agencies, and non-governmental stakeholders.

Some, such as Lengrand et al. (2002) or OECD (2005) see not only the need to broaden the focus from the original science and technology (S&T) platform to a more complex arrangement of innovation policy relevant actors in an "innovation system" setting, but the need for a more generic policy area or platform in which a number of ministries participate. In this third generation of innovation policy, co-ordinated, strategic actions are needed to induce a coherent policy framework for dynamic innovators and structural change. They thus call not only for more policy co-ordination but for higher levels of policy integration.

This understanding of innovation policy making being a multi-actor, multi-sector and multi-level process is compatible with the understanding of governance in policy studies and hence is often termed innovation governance (Boekholt, 2004). Political science scholars use the concept of governance for pointing to a growing complexity of political arenas and processes in terms of enlarged sets of actors and an enlarged set of coordination modes (Benz, 2004). A predominantly governmental view of political steering and control became replaced by the broader understanding of governance that emphasises the role of economic and political and civil society actors' interrelations in various forms of networks of adaptation, negotiation and control.

In particular in an area such as innovation, with its emphasis on knowledge sharing, interaction and learning, policy integration and co-ordination is evidently easier to achieve within existing hierarchies in administration, compared with horizontal policy integration and co-ordination across different administrative units such as agencies or ministries, or between governmental bodies, para-state agencies or private bodies. As governments attempt to respond to greater external and internal complexity and dynamism, policy co-ordination becomes the main means of achieving greater coherence.

Jacobsson and Johnson (2000) identified the following typical weaknesses of under-co-ordinated innovation policy making: poorly articulated demand, local search processes that miss important opportunities elsewhere, too weak networks (hindering knowledge transfer), too strong networks (causing lock ins, dominance of incumbent actors), legislation in favour of incumbent actors or technologies, flaws in the capital markets, or a lack of highly organized actors, meeting places and prime movers.

## 3. The forest sector and innovation related policies

The main objective of COST Action E51 is to develop a better understanding of the issues surrounding integration of innovation and development policies related to the forest for a more effective and sustainable development of the forest sector through promoting innovation by firms. This sector is often considered as a mature, "low-tech" industry which invests comparatively little into R&D and is mainly an innovation user. However, developments in the sector have led to a widely shared perception that past practice might not necessarily bring future success. Interest by society in recreation or environmental, including biodiversity, protection has grown in the last decades. This opens up opportunities for territorial services.

Many sectors in the forest industries in European countries have experienced the increasing demand for green labelling of their products, globalisation and industry concentration. In general, in all sectors, the number of jobs provided has declined and productivity has increased considerably. For quite a long time cost-cutting has been the main answer to economic viability, with the implementation of technological and organisational innovations. However, in recent

years the awareness has risen across the industry that a main area of strategic competition is occurring vis-à-vis other substitute products, in new fields and with new technologies.

In addition to private sector initiatives such as the Forest-based Sector Technology Platform (FTP) which aims to push the sector into a new era that will build more knowledge-based, more customer focused and more innovation oriented industry, a large number of national, EU and regional policies, programmes and initiatives exist that aim at promoting innovation or economic development, and that touch upon forest resources and their use.

Innovation policies as well as entrepreneurship related policies are a key pillar of the EU "Lisbon Strategy", the economic development policy of the EU endorsed in March 2000. On the EU-policy level, innovation is recognized as a crucial factor for the creation of economic growth and employment in the EU and for enhancing the development of rural regions. The European Union is trying to improve its competitiveness vis-à-vis other players in the global economy by increasing the innovation activities of the European enterprises. The Lisbon Strategy is, after its relaunch, operationally governed by the "Integrated Guidelines for Growth and Jobs" as adopted by the European Council in June 2005. These guidelines comprise broad guidelines for the economic policies of the Member States and the EU, including macro-economic policies for growth and jobs and micro-economic reforms to raise the growth potential as well as guidelines for the employment policies of the Member States. On the basis of these guidelines, Member States were requested to draw up National Reform Programmes (NRPs).

With regard to research policy, innovation is an explicit objective of the EU 7th Framework Programme for Research (FP7). The FP7 which is the Union's main instrument for the funding of research in Europe, contains four specific programmes that correspond to four major objectives of European research policy: cooperation, ideas, people, and capacities. Topics related to the multifunctional management of forests and to the forest-based industries are regularly included in the FP7 calls.

Rural development policies are a central policy area in EU and national policy making in relation to forests and rural development. Rural development policies are growing in importance for the forest sector due to the shift towards "decoupling" financial support from production volumes and the enlargement of the EU. The EU's rural development policy seeks to establish a coherent and sustainable framework for the future of rural areas based on the following main principles: multifunctionality of agriculture, multisectoral and integrated approach to the rural economy and subsidiarity. The overall principles of the EFS, e.g. multifunctionality and sustainability are reflected in the EU rural development policy by bringing together economic, social and environmental objectives. The forestry measures of the rural development programmes at the same time seek to contribute to more global issues such as climate change and biodiversity. The European Agricultural Fund for Rural Development (EAFRD) is the core instrument to achieve the objectives of the EU's rural development policy. EU member countries are required to develop national Rural Development Programmes in order to implement the rural development measures.

The EU regional development policy supports an integrated approach to regional development, taking advantage of natural assets and considering the economic, social and environmental dimensions of sustainable development. One of the principal conditions for creating cohesion in the European territory is to ensure complementarity and balance between urban and rural areas (including the forest areas). The European Fund for Regional Development (EFRD) defines its role and fields of interventions in the promotion of public and private investments helping to reduce regional disparities across the Union. The EFRD addresses regional development, economic change, enhanced competitiveness and territorial cooperation throughout the EU.

Funding priorities include research, innovation, environmental protection and risk prevention, while infrastructure investment retains an important role, especially in the least developed regions. Also the regional development policy was strengthened by a more strategic approach. This contains the Community Strategic Guidelines at European level and the National Strategic Reference Frameworks at the level of the EU Member States.

To complement the economic dimension of EU policies, and in support of the UNCED follow-up related work and processes on sustainable development the EU endorsed the Sustainable Development Strategy in Gothenburg in June 2001, which calls for a range of national follow-up actions, including the development of National Sustainable Development Strategies by EU Member States. Forests produce a renewable resource, wood, and the long history of the awareness and application of the concept of sustainability in this sector is a potentially important role model for other contexts.

The EU environmental policy includes forestry issues, namely climate change, nature and biodiversity, environment and health. DG Environment provides guidance in the areas of conservation of natural resources, agriculture, fisheries, and development and economic cooperation. It aims to achieve sustainable development and integrate environmental concerns into other sectoral policies and other policy areas (e.g. Natura 2000, Sixth Environment Action Programme). In 2007, as part of the EU environmental policies, the Commission took the first steps to address climate change adaptation issue, presenting the framework for adaptation measures and policies to reduce the European Union's vulnerability to the impacts of climate change.

Simultaneously with the climate change challenge, the EU faces a closely related challenge in its energy sector. Wood is a renewable energy source that is a substitute for fossil fuels, and, moreover, is a leading renewable sector for primary energy production in Europe. The Renewable Energy Road Map sets ambitious targets for all Member States, among others, that the EU will reach a 20% share of energy from renewable sources by 2020 and a 10% share of renewable energy specifically in the transport sector. It is included in the Climate and Energy Package, which was adopted by the European Parliament and the Council in 2008. In addition, the Commission Biomass Action Plan sets out measures to increase the development of biomass energy from wood, wastes and agricultural crops by creating market-based incentives to its use and removing barriers to the development of the market. The EU has adopted several directives for promoting renewable energy sources and bio fuels, which aim to increase the production and use of renewable energies, and also set up targets and thresholds. In 2006, the Council of the European Union invited the Member States to develop or update national Biomass Action Plans.

Policy instruments of the EU that specifically deal with forest issues are the Forestry Strategy and the Forest Action Plan. The Council Resolution on a Forestry Strategy for the European Union was adopted in 1998. After the report on the implementation of the forestry strategy by the Commission in 2005 an EU Forest Action Plan was put forward and adopted in 2006. The Action Plan provides a framework for the implementation of forest-related actions at Community and Member States level, and serves as an instrument of co-ordination between different Community actions as well as between Community actions and forest policies of the Member States.

Coordination of a harmonized European forest policy is a problem at EU Member State level, at international level, and thirdly it’s a matter of competences at EU level. Due to the missing legal basis for a common forest policy in the Treaties of the European Community there are no grounds for a common forest policy in the EU as is the case for e.g. common agricultural policy or common fisheries policy. In other words, forest policy in the EU has been largely a matter of national competence, although several other EC policies have important direct effects on the forest sector.

This calls for close coordination between EU and the Member States, within the EU, and across sectors.

National forest programmes (NFPs), promoted through international forest policy processes and commitments such as the so-called "IPF/IFF Proposals for Action", are seen as a tool to develop and implement forest policies in complex settings. NFPs put high importance on the integration of multiple goals, coordination of relevant policy fields and the inclusion of interested stakeholders in policy formulation and implementation.

Forest-based industries are part of the EU industrial policy while at the same time they are closely linked to forestry policy proper. The Communication on the State of the Competitiveness of the EU Forest-Based and Related Industries (1999) deals with the socio-economic characteristics and factors of competitiveness of the wood processing industry and related industries, investigating the challenges that the European wood processing industry is facing, as well as the actions in reaction to these challenges. Evaluation of the communication was carried out in 2004 and followed by the communication on innovative and sustainable forest-based industries in the EU (2008). The later document underscores the importance of forest-based industries for the EU's Growth and Jobs Strategy.

In 2004 the European Commission initiated several European technology platforms in order to support R&D in the EU economy and to mobilise the industry for this goal. The European Confederation of Woodworking Industries (CEI-Bois), the Confederation of European Forest Owners (CEPF) and the Confederation of European Paper Industries (CEPI) responded to that invitation and started the creation of a technology platform for the forest-based sector. This process aimed to include all stakeholders with major interests in forestry, forest-based materials and products. The forest-based sector technology platform was realised in three phases, the development of a common vision for the sector (Vision 2030), of a strategic research agenda (SRA) to meet the vision and implementation of the SRA. Part of the process are national support groups and the development of national research agendas (NRAs) for forest-based sector development in the countries.

## 4. COST Action E51 on integrating innovation and coordinating development policies

A considerable number of policies are directly relevant for the development of the forest sector and its innovation potential. However, those policies not necessarily all integrate innovation, and are not necessarily co-ordinated with policies that are directly relevant for the forest sector, such as the EU forestry strategy, or the Forest Technology Platform's "Strategic Research Agenda". This is where COST Action E51 takes up the issue. One of the objectives is to collect/map/build a body of knowledge on these existing EU as well as national strategies and programmes and their implementation mechanisms on: innovation and entrepreneurship, rural development, regional development and sustainable development policies.

COST Action E51 also aims to identify and analyse key issues in strengthening cross-sectoral policy integration and co-ordination in those key innovation areas relevant for forestry and forest sector enterprises and for local level development in rural areas. This concerns: (a) territory-based service provision (e.g. the provision of recreational forest services, nature conservation services, or protection against natural hazards), and (b) vertical production chains (e.g. timber frame housing, bio-energy or other).

COST Action E51 then aims to bring the analysis of national and EU level policies and programmes and the measures they employ to promote innovation together with the analysis of what firms and local regions aiming to develop innovations actually need. At the end of the day, this synthesis of the supply side and the demand side of innovation related support should help to develop more coherent policies and means of implementation, with a

view to reinforce the development of the sector, especially in rural areas. COST Action E51 thus pursues the following three research questions.

1. In how far is innovation integrated into development policies affecting forestry and forest sector policy?
2. In how far are these policies and programmes co-ordinated?
3. Do such policies and measures create an "innovation enabling environment" – i.e. meet the needs of innovating forest sector firms and promote local forest-based sustainable development?

This book addresses mainly the research question 1: In how far is innovation integrated into development policies affecting forestry and forest sector policy? After clarifying the conceptual and theoretical basis of policy integration and co-ordination, it brings together a number of contributions related to national policies. Ollonqvist and Rimmler address the issue of policies for low-tech and SME dominated industries, such as the forest sector. Gerhard Weiss et al. present the results of the country level analysis on the integration and co-ordination of national level policies across a wide range of development programmes in policy fields directly relevant for the forest sector. Sarvašová et al. look more in depth on a key programme of the EU to promote rural development, and how it relates to the forest sector. Using a number of country cases, Niskanen et al. look at policy diffusion in forest policy and forest industry policy to see whether there are similarities and differences in perceived current and future issues and strategies how to address them. In their contribution, Tykkä et al. analyse the existing national research agenda documents of the Forest Technology Platform to find out how they understand, address and contribute to the promotion of innovation activities in the forest sector.

## 5. The outlook

Innovation is a complex and evolving phenomenon, and the same can be said of innovation policy. The understanding of the importance of innovation for societal well-being and as a fundamental engine of the economy is continuing to evolve, and policy is bound to take account of this. Innovation policies are not standardised and uniform across Europe, reflecting the different contexts, but also different views on the role, importance and workings of innovation. Varying national policies reflect but also shape the way innovation is approached in the countries. They are adjusted to regional circumstances, and different sectors take innovation up differently, including those that are characterised as low-tech (i.e. with low R&D efforts) and dominated by small enterprises, such as the forest sector. This provides a wide range of approaches and experiences, and allows learning from the policies being tried elsewhere. One of the most challenging issues in innovation policy is the cross-cutting nature of the phenomenon of innovation, which does not follow neat sectoral boundaries, and often needs to cut across existing structures to emerge. This poses a challenge – both when trying to integrate innovation into policies, and to co-ordinate them.

## 7. References

Baumol, W. (2003) The Free-Market Innovation Machine: Analyzing the Growth Miracle of Capitalism. Princeton University Press, US.

Benz, A. (ed.) (2004a) Governance – Regieren in komplexen Regelsystemen. VS Verlag für Sozialwissenschaften Wiesbaden, Germany.

Boekholt, P. (2004) Ensuring policy coherence by improving the governance of innovation policy. EU Trendchart Workshop: Ensuring policy coherence by improving the governance of innovation policy. Brussels.

Edquist, C. and Johnson, B. (1997) Institutions and Organizations in Systems of Innovation. In: Edquist, Charles (ed.), Systems of Innovation: technologies, institutions, and organizations. London, Washington: Pinter.

Edquist, C. (2004) Systems of Innovation – A Critical Review of the State of the Art. In: Fagerberg J., Mowery D., Nelson R. (2004) Handbook of Innovation; Oxford University Press.

Gustafsson, R. and Autio, E. (2006) Grounding for Innovation Policy: The Market, System and Social Cognitive Failure Rationales. Paper presented at Innovation Pressure – Rethinking Competitiveness, Policy and the Society in a Globalised Economy – International ProACT conference, Tampere, Finland, March 15-17, 2006.

Jacobsson, S. and Johnson, A. (2000) The Diffusion of Renewable Energy Technology: An Analytical Framework and Key Issues for Research. Energy Policy, 28, 625-640.

Lengrand, L. (2002) Innovation tomorrow. Innovation policy and the regulatory framework: Making innovation an integral part of the broader structural agenda. Innovation papers No 28. Directorate-General for Enterprise. European Communities.

Mayntz, R. (2004) 'Governance im modernen Staat', in: Benz, A. (ed.): Governance – Regieren in komplexen Regelsystemen. VS Verlag für Sozialwissenschaften Wiesbaden, Germany.

OECD (2005) Governance of Innovation Systems. Vol 1: Synthesis Report. Organisation For Economic Co-Operation And Development, Paris.

Oxera Ltd. (2005) Innovation market failures and state aid: developing criteria. Report prepared for DG for Enterprise and Industry European Commission. European Communities.

Smits, R. and Kuhlmann, S. (2004) The rise of systemic instruments in innovation policy. Int. J. Foresight and Innovation Policy, 1, 4-32.

Weisbrod, B. A. (1978) 'Problems of Enhancing the Public Interest: Toward a Model of Governmental Failures'. In: B. A. Weisbrod, J. F. Handler and N. K. Komesar (eds.), Public Interest Law, University of California Press, London, pp.30-41.

Chapter II

# Policy Integration and Co-ordination: Theoretical, Methodical and Conceptual Approaches

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## 1. Introduction

The search for better policy coherence has received intensified attention by policy-makers as well as policy analysts. Administrative fragmentation, departmentalism, and coordination problems are recognised as one consequence of a higher functional differentiation of tasks in governance, which becomes more complex with a more globalizing world, and more involvement of non-governmental organizations in policymaking and implementation. Challenges such as environmental issues, globalisation, the European integration, the call for sustainable development, increased importance of innovation policy have led to a rethinking of the organisation of the political processes. Actors are increasingly aware of the need to find ways to govern interdependencies of different policy areas and sectors and the need of considering important societal goals such as sustainable development or innovation not only in one policy area but to integrate these goals into other policy areas as well.

Policy integration and policy co-ordination have thus become important keywords in political discourses on different levels of policy-making. In the international context, intensified coordination between nation states is demanded for solving global problems such as climate change or the loss of biodiversity. In the context of the EU, policy integration and coordination refers to activities and mechanisms between the single Member States and the institutions of the EU as well as the degree of European integration. On the nation state level policy integration and coordination often stand for horizontal mainstreaming of important issues and goals (sustainable development, innovation, etc.) as well as for vertical adjustments between the nation state and regions or different organisations. On the rural level, policy integration gained importance in the "integrated rural development" concepts of the 1970s. Recently, with the gradual reorientation from the EU Common Agricultural Policy focus on agriculture to rural development, the concept of "integrated rural development" has likewise received new impetus within the EU.

With the "integrated rural development" approach, cross-sectoral co-ordination became a central cornerstone of development strategies for rural areas. Integrated rural development asks for the co-ordination of different policies and sectors (horizontal), different levels of actions (vertical) and the inclusion of all relevant stakeholders of a region (participation). A range of integration aspects are inherent to the concept of integrated rural development, including the integration between economic activities whereas neither agriculture nor industry have prevalence any more, the integration between nature and society, the integration between rural and urban territories and societies, etc. (Sotte, 2003).

New political and analytical concepts such as governance, policy learning, innovation system approaches, or network theories have additionally contributed to the increasing significance of the concepts of policy integration and co-ordination.

Policy integration and coordination is of high relevance for forest policy as this sector has manifold interferences with a range of other policy areas and sectors, for example rural development, land use planning, agriculture, regional development, tourism, public infrastructure, environment, nature protection and energy policies. Whether these policies are complementary, mutually beneficiary, duplicating or contradictory depends among others on how goals, actors, instruments and procedures of these policies and sectors are co-ordinated at different levels.

Innovation policy is no longer understood to be limited to traditional research and technology policy but is considered to be a policy issue with large interfaces with other policy areas. A number of recent studies and workshops have supported the search for better coherence in the area of innovation policy (Arnold and Boekholt, 2003; Boekholt et al. 2002; Edler et al. 2003; and Smits et al. 2002). Furthermore, innovation is not any more understood solely as a means for reaching economic growth, strengthening competitiveness and employment. Rather innovation is increasingly understood as a means to contribute to the solution of a range of societal problems and goals, most prominently in environmental protection.

This chapter is based on a background paper for the COST Action E51 "*Integrating innovation and development policies for the forest sector*" (Bauer, 2007, p. 578). It aims at clarifying the two concepts "policy integration" and "policy coordination" for the use in the context of the COST Action. The COST Action E51 deals with two questions:

1. In how far is innovation policy integrated in forest policy, forest sector policy, in rural, regional and sustainable development policies?
2. How, and in how far is policy coordination undertaken between policy actors in the context of innovations of firms in territory-based services and vertical production chains? This includes e.g. forest sector policy, in rural, regional and sustainable development policies, innovation policy, tourism policy, nature conservation policy, energy policy, etc.

## 2. Clarifying concepts – policy integration and policy coordination

The two concepts – policy integration and policy co-ordination – are not clearly and consistently defined in the literature and therefore open to interpretations. Various definitions exist and the delineation of the two concepts is not always clear. Besides, a variety of other terms are used (often synonymously) for referring to policy integration and coordination, e.g. policy coherence, policy consistency, policy diffusion, joined-up government or holistic government or governance. The following section will provide a clarification of the concepts with regard to their use within the work of the COST Action E51.

### *2.1. Policy Integration*

Several theorists in the fields of public policy and public administration have dealt with concepts such as policy coherence, policy integration and policy coordination. One of the first academic references to the term policy integration is found in Underdahl (1980). According to Underdahl's definition:
"*A policy is integrated when the consequences for that policy are recognized as decision premises, aggregated into an overall evaluation and incorporated at all policy levels and into all government agencies involved in its execution*" (Lafferty and Hovden, 2003, p. 8).

Underdahl further formulates three criteria that should be met in order for a policy to be qualified as integrated:

- First, comprehensiveness, including the recognition of a broader scope of policy consequences in terms of time, space, actors and issues,
- Second, aggregation, i.e. a minimal extent to which policy alternatives are evaluated from an overall perspective, and
- Third, consistency, i.e. a minimal extent to which policy penetrates all policy levels and all

government agencies. (Meijers and Stead, 2004, p. 2).

According to Meijers and Stead (2004, p. 2) "*policy integration concerns the management of cross-cutting issues in policy-making that transcend the boundaries of established policy fields, and which do not correspond to the institutional responsibilities of individual departments*". For Meijers and Stead (2004) policy integration thus aims at the development of a joint new policy for the concerned sectors. Policy integration consequently demands more interaction and resources than policy coordination.

Similarly Eggenberger and Partidario (2000) define integration in terms of the establishment of something new: "*integrating in fact means a new entity that is created where new relationships are established, bearing on individual entities that have specific characteristics and specific dynamics but in combination act in a different way*" (Persson, 2004, p. 204). Their criterion for integration in contrast is rather oriented towards coordination: "*whenever there are two professionals with different backgrounds looking at the same problem with similar objectives they are integrating. Whenever there are two different topics that need to be tackled together, there is integration*" (Persson, 2004, p. 204)

For other authors as well, policy integration is close to policy coordination:
"*Policy integration is an activity that links policy actors, organizations, and networks across sector boundaries. Facilitating, supporting, and rewarding processes that cross, expand, or otherwise link policy sector boundaries is a necessary characteristic for intersectoral policy integration.*" (Shannon and Schmidt, 2002, p. 17).
Briassoulis (2004, p. 10) defines policy integration in two ways:
"*Policy integration can be conceptualized as a process either of coordinating and blending policies into a unified whole, or of incorporating concerns of one policy into another (output)*".

The latter definition is also defined as asymmetric policy integration – one policy incorporates concerns of another but this is not always met by similar moves in the other policy (Briassoulis, 2004, p. 4).

Similarly Kivimaa and Mickwitz (2006, p. 730) define policy integration as "*integrating specific policy objectives such as environmental protection or gender equality into other policy sectors*".

To sum up, no single definition of policy integration exists but three basic conceptualisations of policy integration may be found in the literature (see Figure 1):

1. Policy integration as process and output of policy coordination of different policy areas (Shannon, 2002; Eggenberger and Partidario, 2000)
2. Policy integration as the incorporation of the concerns of one policy area into another policy area (Briassoulis, 2004; Kivimaa and Mickwitz, 2006)
3. Policy integration as the development of a joint new policy (Briassoulis, 2004; Eggenberger and Partidario, 2000; Meijers and Stead, 2004).

The concepts of policy integration is most often applied and widely analysed in the context of Environmental Policy Integration (EPI). Environmental policy integration has become a normative principle in the EU environmental policy making (Lenschow, 2002, p. 5) and for many EU Member States. In general, the concept of sustainable development demands the integration of environmental concerns and objectives into non-environmental sectors.

Collier (1994, p. 36) defines environmental policy integration broadly as aiming at:

- Achieving sustainable development and preventing environmental damage;
- Removing contradictions between policies as well as internal inconsistencies;
- Realising mutual benefits and making policies mutually supportive.

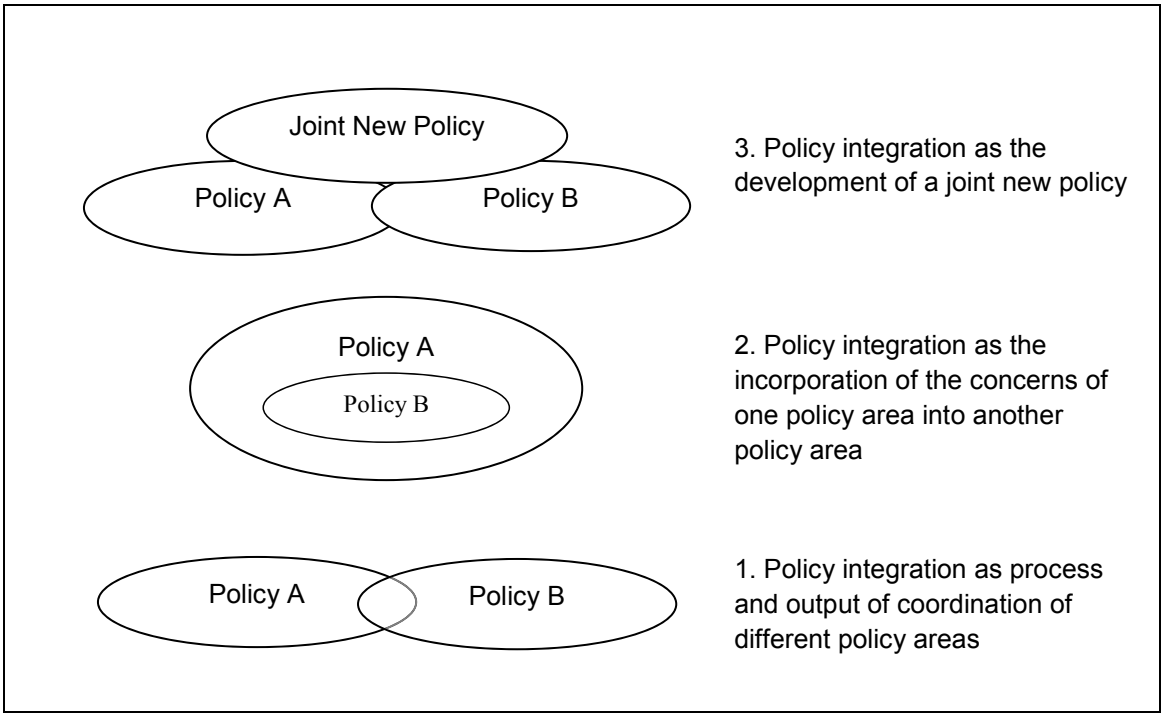


**Figure 1**. Three Understandings of Policy Integration

Lafferty and Hovden (2003, p. 9) define environmental policy integration as:
"*- the incorporation of environmental objectives into all stages of policy-making in non-environmental policy sectors, with a specific recognition of this goals as a guiding principle for planning and execution policy;*
*- accompanied by an attempt to aggregate presumed environmental consequences into an overall evaluation of policy, and a commitment to minimise contradictions between environmental and sectoral policies by giving principles priority to the former over the latter*."

As stated in this definition environmental policy integration includes the prioritisation of the objectives of one policy area, i.e. environmental policy, over the objectives of other policy areas. Environmental objectives should thus overweight sectoral policy objectives.

Is this understanding of Environmental Policy Integration as defined by Lafferty and Hovden (2003) transferable to innovation policy integration? Only partly: the first part – the incorporation of objectives into policy-making of other policy areas may be transferred easily. But the principled priority of the objectives of one policy over the objectives of another policy is not suitable for the case of innovation policy integration. This is mainly due to differences in the objectives of the policy areas. While environmental protection is a priority goal in itself, innovation is mainly considered to be a political goal because of its contribution to a range of other societal goals, including employment creation, promoting competitiveness and sustainable development.

Consequently, Mickwitz and Kivimaa's (2007) definition of innovation policy integration bases on the definition by Lafferty and Hovden (2003) but without referring to the principled priority. Consequently, innovation policy integration can be understood as:
"*- the incorporation of the objectives to promote decisions to develop, commercialise or adopt innovations into all stages of policy making in non-innovation policy sectors;*
*- accompanied by an attempt to aggregate anticipated consequences on innovations and their diffusion into an overall evaluation of policy, and a commitment to minimise contradictions between innovation and*

*sectoral policies*" (Mickwitz and Kivimaa 2007). Policy integration in the context of innovation policy is mainly understood and analysed as making "*innovation policy from a fragmented into an (integrated) multisectoral innovation policy*" (den Hertog, Boekholt et al. 2004). A number of recent studies have analysed attempts and strategies for a more systemic/horizontal innovation policy (see Edler, Kuhlmann et al. 2003; Boekholt, 2004; Arnold and Boekholt, 2003).

Integrated innovation policy in this context implies a more systemic policy where innovation is not only covering the domain of supporting innovation in the economic realm but contributes to solving societal problems more widely (den Hertog, Boekholt et al. 2004, p. 1). The term horizontal innovation policy is often used in this context. Horizontalisation "*could be defined as the degree to which innovation policy is guided by a comprehensive national strategy in which contributions from the various sectors are linked to achieve policy coherence*" (den Hertog, Boekholt et al. 2004, p. 3).

### *2.2. Policy Coordination*

The concept of policy coordination is closely linked to and sometimes used synonymously to the concept of policy integration (as shown above). Very basically, coordination means the adjustment of actions in the case of task interdependencies.

According to Peters (1998, p. 5), policy coordination refers to "*the need to ensure that the various organisations – public and private – charged with delivering public policy work together and do not produce either redundancy or gaps in services*". He defines coordination as "*the alignment of tasks and efforts of multiple units in order to achieve a defined goal. Its aim is to create a greater coherence in policy, and to reduce redundancy, lacunae and contradictions within and between policies*" (Peters, 1998).

Peters further argues that there is a spectrum of coordination options ranging from a minimalist to a maximalist position (see below).

Meijers and Stead (2004) define policy co-ordination as an "*overall state of mutual consistency among different policies*". The purpose of coordination is to ensure consistency and coherence between the various objectives and elements of a single policy or project, within a set of interacting policies or projects (Meijers and Stead, 2004, p. 3). Policy coordination may refer to both – a state of being coordinated (degree) and a process of coordinating policies. Basic features of policy coordination are:

- harmonising decisions
- eliminating redundancies, incoherence and gaps; increasing coherence
- reducing adverse consequences.

Following Peters (1998), the three fundamental modes of coordination are hierarchies/state, markets and networks. Lenschow (2006) additionally identifies a fourth mode – communities.

Within hierarchies/state policy coordination is carried out top-down, based on formal power and authority (Hogl, 2002; Lenschow, 2006). The central pattern of interaction is authority, operationalised in administrative orders, rules and planning on the one hand and dominance as the basic control system on the other hand (Verhoest, Peters et al. 2005). In order to achieve policy coordination, authority must extend all the way to the central level of government as there would be no reason for separate organisations to cooperate otherwise (Peters, 1998, p. 18). Effective hierarchy depends on the leadership and political will of the government as well as on its enforcement capacities and powers. The commitment of organisations or actors at lower levels of the hierarchy to the stated goal is comparatively less important as they can be disciplined from the top (Lenschow, 2006).

Markets as coordinating institutions are based on competition, exchange and negotiations between public and/or private actors. Coordination among the different actors is

carried out by price mechanism, incentives and the self-interest (Verhoest, Peters et al. 2005). There are two distinct coordination mechanisms for different situations. Firstly, when actors are differently endowed and pursue different interests. In this situation, government may simulate market exchange situations in offering incentives for certain desired behaviour (e.g. tax reduction, subsidies, trading of permissions or certificates). Inside government there may be other media of exchange that could be used to create a quasi-market situation. For instance, the exchange of information might facilitate mutual accommodation (Lenschow, 2006).

Secondly, when market actors have a common interest in creating a stable environment in order to plan investments and maximise benefits for the longer term. This prospect of future benefits leads market actors to coordinating their activities with others and to negotiate common rules of conduct. Inside organisations (or in inter-organisational relations) the establishment of reliable rules of procedure serve the same function, namely to increase task efficiency (Lenschow, 2006).

Policy coordination within networks takes the form of cooperation between public and private actors whose inter-organizational relations are ruled by the acknowledgement of mutual interdependencies, interests, trust and the responsibilities of each actor (Verhoest, Peters et al. 2005). Coordination in networks, in the absence of direct enforcement power, is characterized by persuasion and learning (Lenschow, 2006). While most cooperative networks grow 'spontaneously' between organizations, governments may create, take over and sustain network-like structures between organizations by e.g. the creation of common information systems, concentration structures, collective decision making structures, or even common partnership-organizations (Verhoest, Peters et al. 2005).

According to Lenschow (2006), members of communities are tied closer together than members in networks. Emotional ties, as opposed to the pragmatic pursuit of common views, may allow for coordination and compromise even at the expense of one's own interest.

Policy coordination can be characterized according to a number of further dimensions, e.g. whether or not coordination happens actively or passively, whether it is positive (higher degree of cooperation) or negative (low degree of cooperation), whether it is centralized or decentralized, or whether it is voluntary or compulsory.

### *2.3. Horizontal and vertical dimension of policy integration and coordination*

As became apparent in various definitions, both policy integration and policy coordination may be conceptualized along a horizontal and a vertical dimension. Horizontal policy integration and coordination refer to processes and state between different policy areas or different sectors. Vertical policy integration and coordination refer to processes among different policy levels, e.g. local, regional, national and EU level and different functions, i.e. policy formulation and implementation within a particular sectoral policy.

Horizontal policy integration is also often understood as the extent to which a central authority has developed a comprehensive cross-sectoral strategy for e.g. environmental policy or innovation policy (see Lafferty and Hovden, 2003). This includes "*a judicial balancing of the objectives of one policy against other societal goals as a crucial aspect*" (Lafferty and Hovden, 2003).

Horizontal and vertical policy integration and coordination are mutually dependent. Horizontal policy integration cannot become successful if it only occurs on the nation state level but is not implemented by subordinated levels and agencies.

### *2.4. Differentiating policy integration and co-ordination*

As stated earlier the terms policy integration and policy coordination are sometimes used interchangeably. Other authors see

differences between the two concepts, esp. concerning (a) the level of interaction and (b) the output of the activities. According to Meijers and Stead (2004), policy integration requires more inter-sectoral interaction than policy co-ordination. Co-ordination aims at adjusting sectoral policies in order to make them mutually enforcing and consistent, policy integration results in one joint policy for the sectors involved. Co-ordination is about policies of organisations having more or less the same sectoral objectives, while integrated policy-making often departs from a cross-cutting objective not covered by, and on a higher scale than sectoral objectives (e.g. sustainable development).

The following Figure 2 describes the relation between co-operation, coordination and policy integration as presented by Meijers and Stead (2004, p. 5). The figure shows that cooperation and co-ordination are part of the process of policy integration. Altogether policy integration requires more interaction among actors, accessibility and compatibility, leads to more interdependence, needs more formal institutional arrangements, involves more resources, requires stakeholders to give up more autonomy and is more comprehensive in terms of time, space and actors (Meijers and Stead, 2004).

In a different conception “policy integration” refers to the goals and objectives of policies while “policy coordination” has a stronger focus on the actors, procedures and instruments.

## 3. Analysing policy integration and coordination

Briassoulis (2004) presents a methodical concept for measuring policy integration, along a number of key dimensions of integration among policies. Operationally, it concerns *simple and cross relationships* among the objects, goals, actors, procedures and instruments of two or more policies (see Figure 3). In this model simple and cross relationships between policy objects, goals and objectives, actors and networks, procedures, and instruments are illustrated and analysed as the object of policy integration. Analysing policy integration includes examining whether and how the objects, goals, actors, procedures and instruments of different policy areas (horizontal) or different policy levels (vertical) are interrelated.

The author furthermore distinguishes a number of interrelated and interdependent clusters of dimensions of policy integration:

- Substantive (including thematic and conceptual integration)
- Analytical (including the temporal and spatial dimension)
- Procedural, and
- Practical.

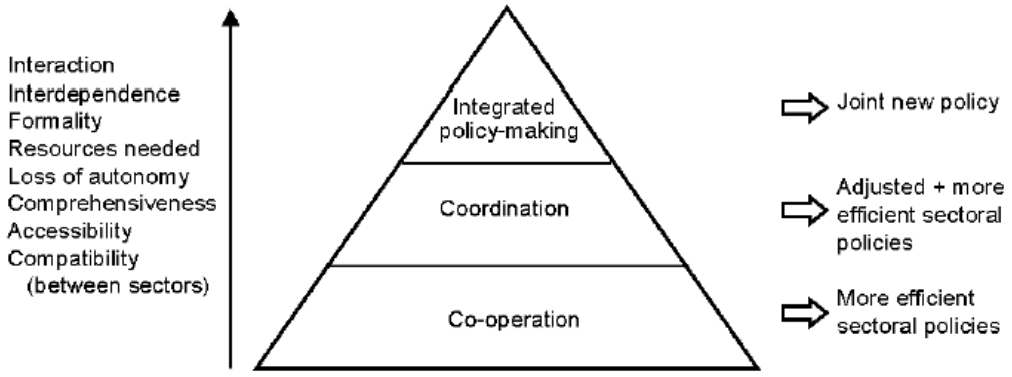


**Figure 2**. Integrated policy-making, policy co-ordination and co-operation (Meijers and Stead 2004)

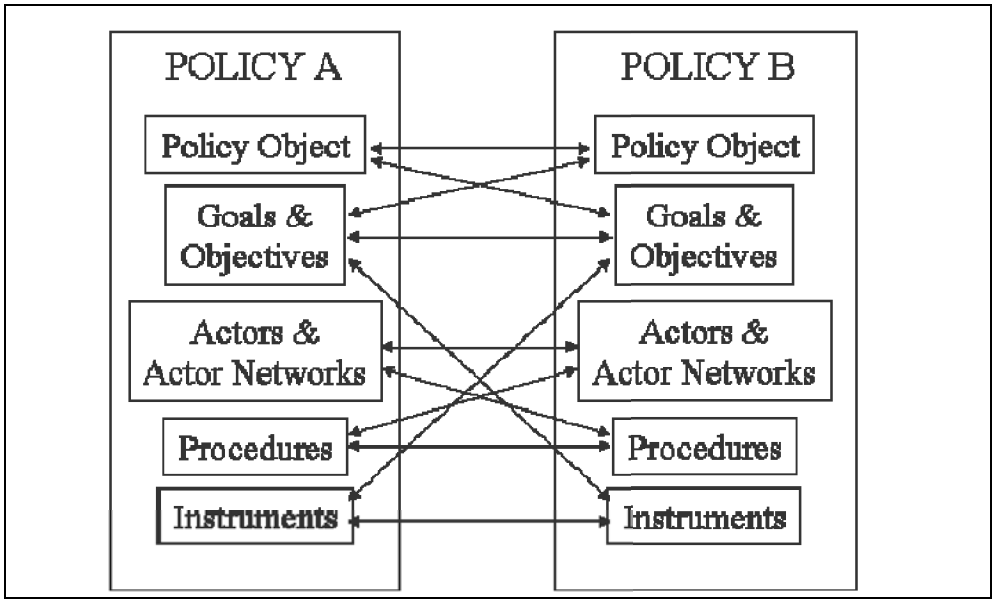


**Figure 3**. Objects of policy integration (Briassoulis, 2004)

Based on this model, Briassoulis (2004) categorises criteria for assessing policy integration in general (see Annex 2). The more of these criteria are met the higher the achievement of policy integration.

Kivimaa and Mickwitz (2006, p. 732) base their evaluation of environmental policy integration in innovation policy on four criteria:

1. "*Inclusion*" – To what degree are environmental aspects covered in policy documents?
2. "*Consistency*" – The consistency of the environmental aspect in relation to other aspects is used to assess the role policy documents give to the issue of consistency when they address environmental issues.
3. "*Weighting*" – The weighting of the environmental aspect with respect to other aspects is used to assess the importance given to environmental issues in policy documents.
4. "*Reporting*" – What is the importance of feedback for policy consistency and effectiveness?

For their evaluation Kivimaa and Mickwitz (2006, p. 733) analyse documents at three levels:

- The strategy level: They analyse the content of strategy documents produced and policy inputs, such as people and financial resources allocated to environmental issues.
- The policy instrument level: Evaluation of the objectives of different technology programmes and the allocation of financial resources to different types of programmes.
- The policy outputs of the technology programmes, i.e. the project funding decisions.

One particular relevant dimension in the context of measurement and analysis is the overall scope of policy integration or coordination. This includes the scope of the policy object and the geographical scope. The policy object ranges from (policy or innovation) systems as a whole, to portfolios of policies or individual policies, to programmes within these policies and individual projects.

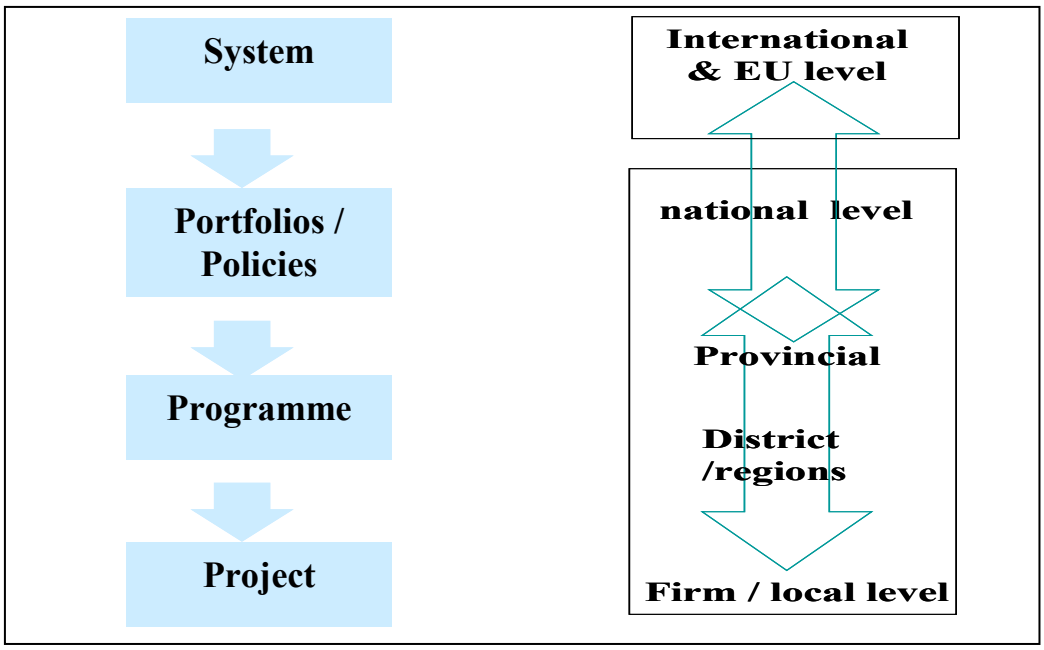


**Figure 4**. Two dimensions of the scope of policy integration and coordination

The geographical scope ranges from international or supra-national (EU-level) co-ordination to the local and firm levels (see Figure 4).

Depending on the scope different methods of analysis are more or less suitable. For instance, systems analysis will *inter alia* focus on actor structures, interaction patterns and the analysis of bottlenecks, comparative policy analysis and evaluation will be applied for studying innovation policies or programmes.

As became already apparent in the previous chapter, both policy integration and policy coordination may either be understood as a process or as a state. While the analysis as a process includes looking at assessment criteria such as procedures, actors' involvement, etc., the analysis as state means determining the degree of co-ordination or integration taking into account such criteria as the extent of redundancy, the degree of incoherence and the existence of important but still untackled issues (see Peters, 1998, p. 296).

When policy integration and coordination are analysed as a state the question would be to what extent two policies are coordinated or integrated. We have already pointed out that policy coordination may be understood as being part of the process of policy integration. Besides many nuances in the degree of policy coordination are thinkable as well. Peters (1998, p. 10) defines a minimalist and a maximalist level of co-ordination:
"*The minimal level might be that at which organizations simply are cognizant of each other's activities and make an honest effort not to duplicate or interfere. […] A maximalist definition might be too severe for most scholars and practitioners since it could require much tighter controls over the activities of organizations and some means of enforcing jurisdictional controls over disputed turf, or of demanding that the gaps in services be remedied. A maximalist definition might also require developing substantial uniformity in the standards of treatment across a country […]. This amount of coordination might also require a level of omniscience and omnipotence that few public sectors possess*".

The most often applied scale for determining the degree of policy co-ordination is the one developed by Metcalfe (1994, p. 281) for the intergovernmental coordination for international processes (see Figure 5). The scale spans eight levels ranging from independent decision making to establishing and achieving common government priorities.

Policies can be more or less closely co-ordinated. Usually, there are considerable differences amongst different stakeholders about the adequate level of coordination. It is thus useful to find common ground as to the most appropriate areas as well as the jointly accepted degree of coordination amongst those involved. Metcalfe (1994) proposes nine different levels of policy coordination (see Figure 5). At the lowest level of the scale, each actor maintains its autonomy and makes decisions independently. At the second level organizations involved focus on information exchange, but not necessarily dialogue (consultation and feedback), which is the focus at the third level. The fourth level adds the component of balancing the perspectives of the different actors by a focus on avoiding clear divergences. The next level, level 5, co-ordination aims at consensus and common objectives. Levels 6 and 7 comprise coordination actions in situations in which ministries/agencies have not been able to find an agreement on their own.

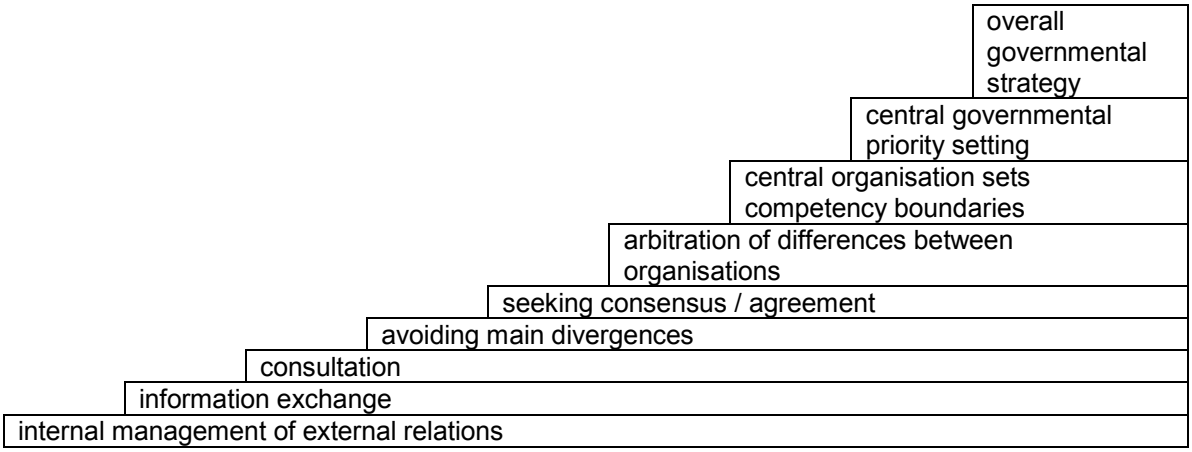


**Figure 5**. Metcalfe Scale of Coordination (Metcalfe, 1994)

A third party, normally the centre of government, acts as arbitration body or decides on the limits to 'ministries/agencies' actions. In Level 8 and 9, there are clear governmental priorities or joint strategies that give a definite direction.

## 4. Mechanisms for policy integration and coordination

In relation to policy measures and instruments a considerable number of classifications exist, as do for mechanisms to integrate them. For instance, Jacob and Volkery (2004) distinguish between two approaches to policy integration (a) centralised and (b) decentralised. These two different but interrelated approaches refer to the understanding of policy integration as (a) the development of a joint new policy and (b) the integration of the objectives of one policy into another policy area (see chapter 2.1 above). Decentralised tools for environmental policy integration include for example sectoral environmental strategies, environmental departments in the different sectors, green budgeting, strategic environmental assessment and impact assessment of policy initiatives (Volkery and Jacob, 2008). National environmental planning, National Sustainable Development Strategies, constitutional provisions to protect the environment, independent institutions for evaluation and monitoring, consultation procedures, veto rights, green cabinets and interdepartmental working groups are among the centralised tools for environmental policy integration (Volkery and Jacob, 2008).

Besides centralised mechanisms and decentralised mechanisms Jacob and Volkery (2004) distinguish between political strategies and administrative instruments. In relation to innovation policy integration, centralised political strategies would include the National

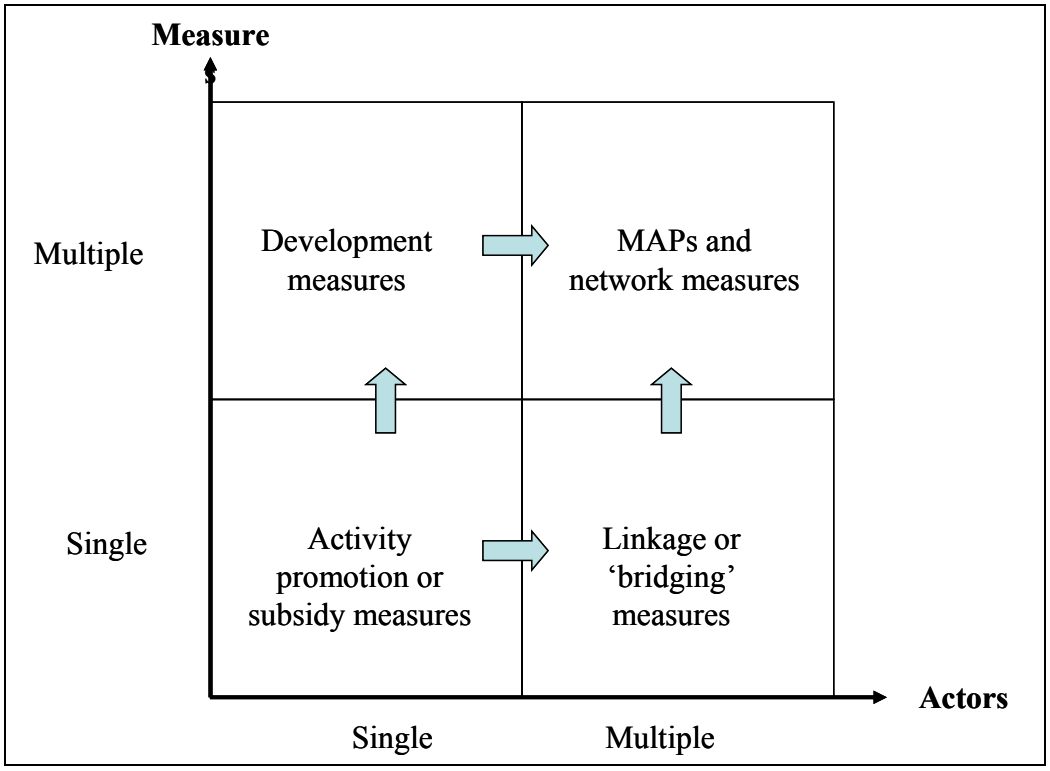


**Figure 6**. Policy integration – actors and measures instruments (MAP=Multi Activity Programmes (Boeckholt, 2004))

Reform Programmes developed by the EU Member States in the course of the Lisbon process, White Papers on Innovation, the establishment of National Councils for Innovation or similar. An example for a co-ordinated but decentralized implementation mechanism for integrated development are various bottom-up approaches for local and rural development, as, e.g. framed and applied in the EU LEADER programme.

Arnold and Boekholt (2003) identify four categories of co-ordination mechanisms in the context of research and innovation governance:

- Cross-ministry/agency programmes
- Inter-agency co-operation agreements
- Ad hoc co-ordination
- Use of planning processes and procedures that require co-ordination.

With the increasing recognition of complexity of innovation in practice, innovation policies get more complex and "systemic" in each policy area, and increasingly use different instrument mix to address these systemic aspects. As Figure 6 shows, single measures by single actors tend to get replaced by multi-measure packages, and further integrated with packages of multiple measures by other actors. Particularly in the context of innovation policies and driven by the rise of innovation system concepts, linkage or bridging measures to connect multiple actors have seen a considerable surge in the last decade. The challenge in policy is to integrate measures and actors even further, with a view to arrive at coherent and effective multi-activity programmes and related network measures.

## 5. Factors for success or failure of policy integration and coordination

Persson (2004) on the basis of Lenschow and Zito (1998) groups the explanatory factors for the success of policy integration into three broad categories:

(a) Normative factors,
(b) Organisational factors and
(c) Procedural factors.

Normative factors refer to values, norms and policy-making and administrative culture that set the general parameters of policy-making (Persson 2004, p. 28). Normative factors include high-level policy commitment and strong and clear leadership, societal backing, dominating policy paradigms and traditions, time perspective, and the use of knowledge and science. Policy integration needs high-level political commitment including strong political leadership to be successful. The lack of political will is often identified as a main barrier for better policy integration (Persson, 2004). This was also the result of a recent survey among forest administrations in Europe. The lack of high-level policy commitment was identified as the second most important impediment for the integration of innovation policy measures in national forest policy (after the lack of financial resources) (Bauer and Rametsteiner, 2006). Maetz and Balié (2006) identify six factors that determine the existence and intensity of political will: presence of a real problem, interest, policy climate and context, presence and allocation of additional resources, convergence of stakeholders' views, and links with national priorities. Besides support from the top political level, policy integration also needs support from the bottom, i.e. societal backing.

A formal overall policy framework for policy integration is identified as an important means to define a strategic perspective and implement policy integration effectively. Such an overall policy framework includes National Reform Programmes in the case of innovation policy or National Sustainable Development Strategies for sustainable development policies. These programmes and strategies set overall principles that should guide not only single sectoral policies but overall governmental strategy. The factor policy paradigm and tradition refers to the main assumptions on which policy is based, the way in which policy is made and the professional culture among policy-makers. However, ideas, policy paradigms and traditions are rather difficult to change and take longer times (Persson, 2004). Whitelegg (2004) analysed the coordination between innovation and transportation policy and found that interaction between the policy areas is difficult partly due to differences in thinking between the policy areas (experimental versus stability). Each policy area does not make allowances for the differences in thinking and instead believes the other one should change (Whitelegg, 2004, p. 5). Further, a lack of long-term perspective in policy-making is generally identified as a hindering factor for successful policy integration.

Organisational factors for policy integration include the general government architecture, interaction of actors within and outside government, power structures, resource allocation and budgeting, and capacity (Persson, 2004, p. 29). A main reason for the lack of policy coherence is seen in sectoral departmentalisation and institutional fragmentation within government. Departmentalisation leads to a competition between sector departments regarding resources thus hindering policy integration and coordination. Besides sectoral fragmentation also federal, i.e. vertical, division of functions may impede better policy coherence. Collier (1994, p. 245) states that policy integration generally is easier in centralised countries. Strategies to overcome these impediments include institutional reforms such as (a) the integration of departments and functions, (b) the establishment of new institutions (e.g. National Innovation Councils in the case of Innovation Policy Integration), (c) the assignment of existing institutions with a new mandate, responsibility and accountability (Persson, 2004, p. 30). Other mechanisms to increase coordination and communication include inter-ministerial committees and task forces, networks schemes, regular circulation of staff between sector departments (Persson, 2004, p. 30f). Another frequently mentioned tool is the budgeting process (see also chapter 5).

Procedural factors include strategies and action plans and systematic assessment procedures (Persson, 2004). The development of a sector strategy refers to the integration of policy objectives of one policy into other policy areas. Further, evaluation and assessment procedures have become important tools in

Environmental Policy Integration (e.g. environmental impact assessment). The rules of decision-making may also be adapted to increase coordination among different actors. The rules include the right to set formal agendas, the right to develop policy proposals and the timing of participation by different departments and agencies (Persson, 2004, p. 32).

Lenschow (2002) identifies three dimensions of factors for Environmental Policy Integration: actors, ideas and institutions. Factors concerning the actors in the policy-making process include their policy preferences, their power and influence in the decision-making process, the political commitment of sectoral policy-makers and the existence of political leadership (from above) or pressure or mobilization of societal actors (Lenschow, 2002, p. 16f). Lenschow further states that "*it is helpful to consider policy interests as embedded in a frame of reference, which prestructures the thinking within a policy sector…*". The acceptance of certain ideas (for example sustainable development or systemic innovation approach), the relative persuasiveness of the causal story and the spread and stability of policy ideas have strong influence on the opportunities for successful policy integration (Lenschow, 2002, p. 17). The more changes depart from traditional practices and involve larger the institutional changes the more difficult it will be (Lenschow, 2002, p. 18).

## 6. Limits of policy coordination

Finally, policy integration and co-ordination have their limits. The main limits are related to aspects of democracy, trade-offs and costs. According to Persson (2004), as decision-making power is ever more decentralised there is a danger of loss of democracy wherever there is a loss of concrete accountability for actions and policies due to the increasing number of actors involved. At the same time policy coordination across a broader spectrum of policies can enable better representation of values and interests of society, which should enhance the legitimacy of policies. If decision making moves to ever higher levels of the political hierarchy in policy integration, this might put legitimacy of policy decisions in question.

Further, coordination and cooperation are often seen as an additional burden as they imply an increase in complexity and additional uncertainty by many actors. On the one side more information has to be processed and on the other side coordination is not free of costs, nor free from hidden strategic motivations of the actors involved, which can thus lead to the loss of (political) ground. Additionally, coordination and cooperation require additional resources without necessarily creating a compensating gain (trade-offs). The decreasing resource endowment might lower the incentive to engage in co-operations and coordinate (Ohler, Polt et al. 2004, p. 47).

It is important to acknowledge that the competition that exists over scarce resources of funds, budgets, political power and competence likely determines the willingness of independent bodies to co-operate. Economically speaking, the willingness to cooperate is dependent on their (and one's own) assessment of the potential additional (marginal) benefits of increasing cooperation with the potential added (marginal) costs involved, and the degree of risk one takes. Thus, co-operation can likely be improved up to a point where the benefits outweigh the costs and risk taken. This, however, is often the case. The best way for political actors to get access to larger shares of scarce resources is through cooperation with others, which does not necessarily restrict competition. Many similar examples of cooperation between competitors can be found in the business domain, coordinated through markets. For example, efforts in risky research and development projects are often undertaken in cooperation between competitors.

## 8. References

Arnold, E. and Boekholt, P. (2003) Research and Innovation Governance in Eight Countries. Technopolis: 61.

Bauer, A. and Rametsteiner, E. (2006) UNECE and EFI PC INNOFORCE Innovation and Forest Policy Survey 2005. Results of a survey among forest administrations in Europe, University of Natural Resources and Applied Life Sciences Vienna: 33.

Boekholt, P. (2004) Ensuring policy coherence by improving the governance of innovation policy. EU Trendchart Workshop: Ensuring policy coherence by improving the governance of innovation policy. Brussels.

Boekholt, P. et al. (2002) The Governance of Research and Innovation An international comparative study. Country reports, Technopolis, Amsterdam.

Briassoulis, H. (2004) Policy Integration for Complex Policy Problems: What, Why and How. Berlin Conference “Greening of Policies: Interlinkages and Policy Integration”, Berlin.

Collier, U. (1994) Energy and the Environment in the European Union. The Challenge of Integration. Aldershot, Avebury.

den Hertog, P., P. Boekholt, et al. (2004) MONIT Conceptual Paper. Oslo.

Edler, J., Kuhlmann, S., et al. (2003) New Governance for Innovation. The Need for Horizontal and Systemic Policy Co-ordination. Karlsruhe, Fraunhofer Institute Systems and Innovation Research: 28.

Eggenberger, M. and Partidario, M. (2000) Development of a framework to assist the integration of environmental, social and economic issues in spatial planning. Impact Assessment and Project Appraisal, 18, 201-207.

Hogl, K. (2002) Reflections on Inter-Sectoral Co-ordination in National Forest Programmes. Cross-Sectoral Policy Impacts on Forests. Joensuu, European Forest Institute: 75-89.

Jacob, K. and Volkery, A. (2004) Potentials and Limits for Policy Change Through Governmental Self-Regulation – The Case for Environmental Policy Integration. Proceedings of the 2002 Berlin Conference on the Human Dimensions of Global Environmental Change “Knowledge for the Sustainability Transition. The Challenge for Social Science. Amsterdam, Berlin, Potsdam and Oldenburg, Global Governance Project: 202-213.

Kivimaa, P. and Mickwitz, P. (2006) The challenge of greening technologies – Environmental policy integration in Finnish technology policies. Research Policy, 35, 729-744.

Lafferty, W. M. and Hovden, E. (2003) Environmental Policy Integration: Towards an Analytical Framework. Environmental Politics, 12, 1-22.

Lenschow, A. (2007) The modes of EPI in theory and practice. Draft paper. Ecologic – Institute for International and European Environmental Policy Berlin, February 2007.

Lenschow, A. (2002) Greening the European Union: An Introduction. Environmental Policy Integration. Greening Sectoral Policies in Europe. London, Earthscan Publications Ltd.

Lenschow, A. and Zito, A. (1998) Blurring or shifting of policy frames? Institutionalization of the economic-environmental policy linkage in the European Community. Governance, 11, 415-442.

Maetz, M. and Balié, J. (2008) Influencing policy processes – Lessons from experience. FAO Policy Assistance Series, 4. Rome, Food and Agriculture Organization.

Meijers, E. and Stead, D. (2004) Policy Integration: What does it mean and how can it be achieved? 2004 Berlin Conference on the Human Dimensions of Global Environmental Change: Greening of Policies – Interlinkages and Policy Integration, Berlin.

Metcalfe, L.M. (1994) International Policy Coordination and Public Management Reform. International Review of Administration Sciences, 60, 271-290.

Mickwitz, P. and Kivimaa, P. (2007) Evaluating Policy Integration: The Case of Policies for Environmentally Friendlier Technological Innovations. Evaluation, 13, 68-86.

Ohler, F., Polt, W. et al. (2004) Governance in Austrian Information Society Policy. Vienna, Joanneum Research Technopolis: 59.

Persson, Å. (2004) Environmental Policy Integration: An Introduction. Stockholm, Stockholm Environment Institut.

Peters, B. G. (1998) Managing Horizontal Government. The Politics of Coordination, Canadian Centre for Management Development.

Russel, D. (2004) The Environment Test and Policy Integration: a New Dawn or a False Start? 2004 Berlin Conference on the Human Dimensions of Global Environmental Change: Greening of Policies – Interlinkages and Policy Integration, Berlin.

Shannon, M. and Schmidt, C.H. (2002) Theoretical Approaches to Understanding Intersectoral Policy Integration. Cross-Sectoral Policy Impacts on Forests. Joensuu, European Forest Institute: 15-26.

Smits, R. and Kuhlmann, St. (2002) Strengthening interfaces in innovation systems: rationale, concepts and (new) instruments. Report for the EC STRATA Workshop “New challenges and new responses for S&T policies in Europe” Brussels, 22-23 April 2002.

Sotte, F. (2003) An Evolutionary Approach to Rural Development. Some Lessons for Policymaker. Conference of the Slovenian Associations of Agricultural Economist. Ljubjana.

Underdahl, A. (1980) Integrated marine policy – What? Why? How? Marine Policy, 4, 159-169.

Verhoest, K., Peters, B. G., et al. (2005) How coordination and control of public organizations by government interrelate: an analytical and empirical exploration. Research paper available at: http://soc.kuleuven.be/io/pubpdf/io02060016_coordination_scancor.pdf (26 04 2007)

Volkery, A. and Jacob, K. (2008) Comparison of tools for environmental policy integration in 30 OECD-countries. in: Jordan, A. and A. Lenschow (eds.) Innovation in Environmental Policy? Integrating the Environment for Sustainability. Edward Elgar Publishing Ltd, UK.

Whitelegg, K. (2004) Patchwork Policy Making – Linking innovation and Transport Policy in Austria. Seibersdorf, ARC Systems Research GmbH: 54.

Zingerli, C., Bisang, K. et al. (2004). Challenges of Policy Integration: Intersectoral Coordination in International and National Forest Policy. 2004 Berlin Conference on the Human Dimensions of Global Environmental Change – “Greening of Policies – Interlinkages and Policy Integration”, Freie Universität Berlin.

Chapter III

# Policy Integration Supporting Innovation Policy Design for SMEs

Pekka Ollonqvist
Thomas Rimmler

## 1. Introduction

The European Union has identified the specific needs of low tech industries in policy activities to promote innovation. These needs have specific features when small and medium-sized enterprises (SMEs) are concerned. These needs centre to complementary knowledge and services available in the regional or local infrastructure. Fast intake of new technologies and barrier removals in international trade has increased international competition especially in traditional low tech industries during the two recent decades. Fast transportation and other logistic cost decrease have supported the enhancing presence of multinational corporations and related value networks in regional and local low tech industry markets in EU countries. These development trends have weakened the specific competitive advantages (CAs) in those EU industries. The latter development has forced European low tech industry firms more and more accept subcontracting with global scale business. These contracts, first assumed opportunities to local SMEs, tend to challenge the creation of sustained CAs among those firms. Subcontracting does not support the emergence of independent technical knowledge base but create dependencies from short run interests of global corporations. Embedded local technology knowledge and local customer market presence in the business environment are among (SME) specific frameworks towards their CAs. These features are aimed to be maintained in EU market area through specific policy actions.

Innovativeness has been adopted as a cross-cutting policy objective in the joint European industrial policy. The coordinated and integrated policies aim to improve favourable framework conditions for enhancing industrial competitiveness (Communication on Industrial Policy in an enlarged Europe, COM 2002). Policy coordination in innovation context aims to determine the direction of scientific and technological research but also to improve the implementation of new technologies (EC Innovation papers no 28). However, EU Commission has currently accepted enhanced innovativeness among traditional mature industries into their policy objectives (Communication on Industrial Policy in an enlarged Europe 2002). Improved innovation capability among low tech industry firms imply the strengthening of scientific and technological research output use. The coordinated policy actions improving the possibilities among low tech SMEs to cumulate and distribute their DUI (Doing, Using, Interacting) is also realized. The systematic documentation and distribution of the tacit knowledge from low tech SMEs should be available in those industries for the further innovation processes. The latter target implies policy transfer: from R&D and technology-push-centric thinking towards the creation of improved knowledge infrastructures, inter firm cooperation and learning capability creation. This new policy mode needs organizational structures transmitting knowledge for the benefits among SMEs. The attention among policy makers has recently been extended from science and R&D

towards the near-market end of the innovation processes. New innovation policy has enlarged from firm subsidies and tax incentives towards policies supporting the creation of CA potentials in wide innovation context (Reid and Peter, 2008).

## 2. Research task

European innovation policy makers have identified that strengthening innovative capabilities among firms in low tech industries is rational policy objective. Since the 1960's the target of innovation policy has been broadened from providing direct subsidies to private R&D measures in R&D intensive high-tech industries towards reinforcing the demand, diffusion and application of new knowledge in low-tech industries. The measures to strengthen the innovative capacity of low-tech industries broadly covers the competencies of firms to identify business opportunities and corresponding innovation needs and to develop the competences and resources necessary to access, employ and successfully exploit the new knowledge in the market.

Low tech industry firms lack traditions to implement research findings to high tech products but can create new unique CAs through innovation processes. However, the main obstacle is the lack of intra firm resources. The specific needs in this context are among the key challenges for European innovation policy. This policy has expanded from R&D oriented support and has adopted a wide innovation approach supporting the key drivers among European low tech firms, SMEs as well as large corporations, for growth, competitiveness and productivity through innovation process outputs. The current wide innovation policy covers organizational and market innovations in addition to direct public interventions into firm specific R&D investments. Knowledge and competence improvements are in the systemic innovation view complemented through distributed, interactive and integrated learning processes within network structures. Innovation support in interactive learning processes cover intermediary activities between producers, developers and users of knowledge. Knowledge transfer is facilitated in terms of knowledge and competences, structures for interaction, and respective collective development strategies (Lorenzen, 1999).

The new innovation policy approach needs active policy integration. Major integration needs are within regional and rural policies. The creation of local innovation infrastructures are among the key policy targets to support the CAs among low tech SMEs. National governments resume their responsibilities for better policy coordination and integration. The latter are needed to support innovation processes but also to equalize the supply of intellectual and knowledge resources and capabilities to match with the complementary demand of these by innovating firms. The challenges to equalize the knowledge supply through the mediating agents (gatekeepers) and other intermediating structures with the demand of that knowledge among the SME managers are in the focus of this text.

The challenges to develop local and regional innovation infrastructures to match with the needs of low tech SMEs are discussed in the context of policy coordination and integration towards practical policy implementation incidence. The text focus is in the institutions transmitting knowledge but also in the relationships by which the promotion and enhanced access to external resources and competences among SMEs could be improved.

## 3. Innovation performance deficiencies among low-tech SMEs

Innovation initiatives among low tech firms and especially among SMEs are pushed by competitors, demanding users and customers tending to favour narrow networking and learning-by-doing in innovation activities. The negative knowledge accumulation spiral among many mature industry SMEs starts form supplier-domination based on the dependency of a subcontractor on new knowledge and technology processed by or

through the network leader. New policy activities are needed to provide ways to systematically improve capabilities towards independent innovation processes. Innovation capabilities among SMEs imply technical competencies but also skills and knowledge to find new market solutions and other CAs. Low tech SMEs must differentiate their products and/or services from their local competitors. Low knowledge receptivity in terms of entrepreneurial competence is one of the major policy challenges against easy technology diffusion among SMEs in low-tech industries. SME managers frequently lack the strategic capabilities to formulate and implement their business strategy along the needs for a proactive innovation strategy. The same deficiencies concern abilities to evaluate the strategic relevance of new-to-the-firm technologies (Arnold and Thuriaux, 1997; Morgan, 1995). SME managers frequently lack time and knowledge to reorganize their business processes to fully exploit the economic potential created with technological innovations.

Initiation to an innovation process among SMEs is frequently pushed by competitors, demanding users and customers. The competitive position enforcement in the market is in general the major fact addressing SME managers to search for innovation opportunities. The current CAs among SMEs has typically local origin and resource base and local and rural communities what concerns the availability and accessibility are relevant for complementary resources. The lack of intra firm tangible resources and disabilities to use complementary external resources are frequently observed behind the low innovation activities and performance outputs. The findings are partly due to the low or missing supply of the key resource in terms of human capital, organizational capabilities and limited external relationships. The disequilibrium between the demand and supply of resources and local mediating agents are recent innovation policy challenges but address also the importance of policy coordination and integration (Capaldo ibid.). The dependence on regional or local complementary factors, skills and other resources among SMEs address high priority to policy coordination and integration in innovation policy context (for findings from wood-industry companies see Hansen et. al. 2006). On the other hand the survival of SME structures and district configurations are essential for the economic sustainability and employment in the regions concerned. All these issues support multi functional policy activities and tools for innovation support.

The specific needs and challenges among SMEs support structural rearrangements in the interests and tasks among national, regional and local policy stakeholders. Innovation policy has cross-cutting tasks implying policy coordination with other policy areas. The needs of policy integration can be derived from the needs to finance innovation system and process development (Bauer, 2006). The recent tendencies in value chain business have supported intensified key competency use among firms thus supporting their increased specialization. The value networks of specialized firms imply reorganizations among the tasks of the value chain participants. These specialization activities have covered production outsourcing, subcontracting and partnering solutions as well as other disintegration activities. The fragmented value network structures tend to benefit from policy outputs to innovation support that have been created through coordinated activities

Many mature industry SMEs are supplier-dominated meaning dependency on new knowledge and technology processed by or through the network leader (Pavitt, 1984). They typically operate as second or lower tier suppliers of standard product components in vertical value operating under particular cost pressure. Those firms have limited competencies for individual innovation processes that in turn constitute a major challenge for policy integration and coordination in innovation policy context to confirm opportunities to create independent role as producers or partners in parallel value networks. The benefits from policy coordination and integration are indirectly valuable also to large companies with their

own R&D capacities because of their dependencies on SMEs as subcontractors or partners. The concept of systemic innovation pays special attention to the interdependencies between the innovating firm and its external environment (Schienstock and Hämäläinen, 2000).

Empirical research findings support the credibility of extended policy coordination and integration in local policy implementation infrastructures when structural development in regional and local industries and innovation activities are concerned (Bender and Laestadius, 2005). Entrepreneurial attitudes, perceptions on benefits may explain the low participation among SME managers to organized learning. Mature industries are characterized by steady state technologies and little technological opportunities and technological lock-in are common among the firms with narrow networking and learning-by-doing activities (Schienstock and Hämäläinen, 2000). The low interests in innovation policy programs co connect customer and consumer participation into innovation processes can also explain the low interests among low tech SME mangers.

The economic performance among traditional low-tech industry SMEs has important role for the development of regional and rural economies. This position of SMEs in local economies makes them a special target for policy support concerning innovation performance improvement. The innovation targets among SMEs do not proactively search for new innovation opportunities but tend to imitate current best practices. They tend to prefer the use of their own embodied tangible assets and fine tune their manufacturing equipments incrementally. Those firms are less innovative than in high-tech industries and mainly aim to introduce incrementally new products. Product innovations in low-tech industries are characterized by a relatively low degree of complexity and novelty (Palmberg, 2001).

## 4. Innovation behaviour and performance among wood product industry SMEs

The information and knowledge service demand among wood product industry SMEs have traditionally been directed to technology and value chain specific channels. Due to the maturity and low-complexity of products there is limited scope for product innovation. Limited possibilities for protecting innovations from imitation and the absence of technological opportunities discourage firms to engage in developing new products and explain the low priority of product innovation in the industry. Low returns due to fierce price competition in commodity markets typical for a mature industry further causes scarcity of resources for competence building and innovation as a strategy to maintain the flexibility to react to unanticipated environmental change. As a consequence there is also limited demand for information and services in support of innovation activities.

The current innovation policy identifies organizational or market innovations as the basic managerial interest fields concerning CA creation among low tech industries. This has not become popular in wood product industry firms where product and process development issues dominate. Innovations in business systems have had an inferior position also in the related research (Hovgaard and Hansen, 2004). However, structured intra firm product development systems have been rare among wood product industry firms and especially among SMEs. The latter tend to explain the limited research interests and fair traditions among firms (Hansen, 2006). Production orientation do not support organizational or market innovativeness in wood product industry strategies. Recent research findings have provided some support on the positive relationship between organizational size and market orientation thus expressing interests to

marketing CAs among large firms (Cao and Hansen, 2006; Wagner and Hansen, 2005). Successful commercialization of new wood products tend to have market-driven product development, multiple knowledge process management, and firm-wide development support as explaining background variables (Bull and Ferguson, 2006). The findings above strongly support innovativeness to be extended into SMEs in wood product industries (Stendahl, 2009). Competitiveness among SMEs in process industries are strengthened and enhanced by (a) product differentiation, (b) successful specialization to niche markets or (c) product innovations inside successful value chain architectures (Hirsch-Kreinsen, 2006). Firm size is a relevant attribute explaining differences innovation behaviour and innovation performance in wood product industries. Intra firm financial resources are limited due to low profit margins. Strong operational burden in day to day business among the managers and inward oriented communication culture have been identified as typical barriers to organizational development towards better use of external resources (Korhonen, 2006). Low R&D input levels among wood product industry SMEs explain their innovation management characterized by incremental wood product innovations thus challenging the applicability of research findings in PILOT research concerning low tech industry innovations in European context (Bender, 2006).

Wood product SMEs have limitations to fully utilize positive scale economies thus focusing product differentiation as major power against young small firms entering into the market with new products. New products are less advanced in wood product industries than those of high-tech industries. The latter indicates high importance of success in domestic markets when compared with high-tech industry SMEs and their products. The availability of fit-for-purpose technologies and access to user-producer and producer-supplier linkages are important sources of specific information and knowledge among SMEs. Low entry barriers due to low product complexity and limited capital requirements support dynamic and continuous innovating processes among wood product SMEs.

Innovations in wood product SMEs can typically be described as best practice imitations with one-off investments into tangible assets. Typical SMEs are standard manufacturers of bottom segments in vertical value chains and operate as standard component producers. Their strategic reorientation is parallel with European low tech industry SMEs: technology-pushed, incremental process improvements with attached incremental fine tuning in their production process with new technology vintages (Hirsch-Kreinsen, 2006). Their innovation processes are typically market-pulled but without immediate contacts with the end users. Subcontractors in wood industries usually have no formal R&D activities of their own. They rather utilize technological innovations implemented by the prime contractor corporation into their blueprints. The supplier-dominated SMEs in wood product industries are among the least advanced initiators of innovations. They generally do not develop their innovations internally, but rather introduce cost-saving process innovations by acquiring and implementing advanced technologies, equipments and materials produced in other sectors.

## 5. New rationales behind innovation policy interventions

Innovation policy implemented through systemic structures cover learning process support to non-technological innovations as well as knowledge diffusion and exploitation processes. Current innovation policy acknowledges the systematic creation of intra firm competencies to new technical knowledge adaptation but also capabilities to manage processes with external relationships and collaboration. Managerial competencies to reorganize business processes expand the potentials to benefit from technological innovations. Traditional innovation policy (1st generation innovation policy) addressed public support tools to promote R&D activities with

product and process development financing. The policy activities provided market allocation complements towards socially optimal R&D resource use. Policy actions were tailored to compensate uncertainty, lengthy repayment periods and knowledge spillovers constraining the incentives of knowledge producers for R&D expenditures. Policy measures were confined to the promotion of new knowledge and innovation infrastructure creation. This policy undermined those potentials connected to the knowledge and competence diffusion by making high-tech knowledge diffusion through best practice adoption as the major innovation policy argument for low-tech industries (von Tunzelmann and Acha, 2004).

The adoption of systemic innovation approach enlarged the scope of innovation policy preparation from science and technology policy to more general capability and network building framework (Schienstock and Hämäläinen, 2000). This enlarged innovation policy cover learning process support to non-technological innovations as well as knowledge diffusion and exploitation processes (Lundvall et al. 2002; 2005). Current innovation policy rationality acknowledges that innovation processes are not solely related to the intra firm competencies but cover also capabilities to acquire transform as well as new technical knowledge adaptation. External relationships and collaboration, therefore, are essential for tapping external sources of innovation. Managerial competencies to reorganize business processes expand the potentials to benefit from technological innovations.

Insufficient information and the lack of capabilities to identify innovation opportunities frequently impede the incidence of innovation policy tools among low tech industries. (Langlois and Robertson, 1996; Innovation-Enabling Capabilities, see Bender and Laestadius, 2005). Competence building requires firms to invest into their absorptive capacity creation (Cohen and Levinthal, 1990). The absorptive capacity concerned comprises specialized structures, practices and resources and considered to be one of the core concerns of innovation systems parallel with new knowledge generation (Lagendijk and Charles OECD proceedings Boosting innovation (Mowery, 1995)).

Innovation system identification provides comprehensive view on the actors and activities but also innovation supporting infrastructures (legal, regulatory and financial frameworks). National innovation policy put efforts to the enhancement of nationwide institutions and structures identified as National Innovation System (NIS) whereas regional innovation policy focuses on regional and local innovation and interactive learning support in Regional Innovation System (RIS) (Lundvall, 1992). SMEs in traditional mature industries benefit from localized learning thus implying RIS support on capability and competence creation. Innovation learning proceeds in close and intensive collaboration among firms towards co-operation and learning-by-doing benefits. Well-established intellectual property rights, contract law and the form of labour market governance constitute formal institutional framework for more active innovation interests. Innovation policy in this context need extensive policy support and incorporation into decision making in variety of policy areas and arenas towards improved governance and performance of the innovation system (EC Innovation Papers no. 28).

## 6. Coordinated and integrated policies to support innovation systems

Horizontal policy promotes knowledge diffusion beyond sectoral or regional boundaries thus supporting improved coherence in different policy areas, functions and activities.

Vertically integrated innovation policy considers innovations as sustained CA creation for sectors or enterprises interlinked. New policy opportunities allow crossings beyond traditional industrial sectors

boundaries. Diffusion and adoption for ICT and other cross-cutting technologies has started to make these cross-sectoral linkages more common.

Basic intra firm R&D advances can provide basis towards self-sustained commercialization of new products and services without interventions from NIS or RIS. These activities can be supported through traditional innovation policy tools. However, commercialization of R&D outcomes can benefit from integrated policy actions by supporting firm specific complementary commercialization activities (Lankhuizen et.al. 2003).

The mainstream knowledge diffusion from product and process development issues towards commercial solution creation can also be arranged backwards to boost new innovation policy actions. Information from successful innovation commercialization available for R&D stakeholders provides marketing and organizational activity planning potentials already during the R&D stage (EC Innovation Paper nr. 28, Innovation Tomorrow). Regional policy makers, responsible for integrating innovation into regional development strategy and the allocation of regional development funds, could search new options for policy integration by enlarging actor integration outside the innovation systems. These enlargements can integrate public and private research organizations, technical colleges, science parks and technology centres.

The current European innovation policy (European Union Green paper on innovation, Innovation Action Plan) recognizes non-linearity and recursive links in innovation processes. This new approach broadens the spectrum of necessary policy instruments. Science, Technology and Innovation (STI) oriented innovation policy in EU. STI orientation highlighted NIS activities keeping RIS policies on second priority. STI-policy covers the domains of (1) science policy, including, for example, higher and university education research, training, (2) technology policy and (3) innovation policy including the diffusion and absorption of new technologies. It does not cover contextual or framework policies such as competition policy, industrial policy, fiscal policy, employment policy etc., in spite of their importance for innovation.

Horizontal policy activities accentuate the diffusion of key technologies beyond sectoral or regional boundaries thus favouring fast-growing targets. Horizontal policy coordination towards innovation support address the improved coherence between the decisions in different policy areas as a collective tool to shape functions, activities, organizational set-up and institutional framework conditions for innovation system improvements. Horizontal coordination is especially relevant when a wide innovation approach is applied (Bauer, 2006).

Vertically integrated innovation policy address innovations as means to achieve and sustain CAs for industrial sectors or groups of enterprises interlinked. These interlinks can be within a vertical value chain or industrial cluster respectively thus creating innovation potentials and fostering innovation capabilities (see Bauer (2006) for the questions addressed by COST E51). Vertical innovation policy integration is about sector-special measures on how to integrate innovation support into sectoral policies (Ruud and Larsen, 2004. MONIT). Business formation based on regional or local value-chain structures as well as the needs to promote commercial applications accentuate benefits achievable through sectoral policy coordination and integration. The effective SIS provisions can be characterized by a distinct technological regime and sector-specific innovation processes. The latter imply sufficient address to specific industrial sector issues. Selective policy measures are preferred over horizontal measures to address the specific requirements (Reid and Peter, 2008).

The inappropriateness to account for new technologies and innovative business strategies through the existing industrial sectors is a big concern in cross-sectoral innovation policy integration. New opportunities tend to cross over the traditional

industrial sectors boundaries. Diffusion and adoption for ICT and other cross-cutting technologies, like biotechnology and nanotechnology, should be considered when creating cross-sectoral linkages for innovation systems fostering innovation in low-tech industries (Reid and Peter, 2008). Cross-sectoral innovation policy is concerned with business applications based on the exploitation of key technologies. Technologies may be developed and applied in related and supporting industries and may be embodied through intermediate products, machinery, equipment or ICT applications used in the cluster's core activities. Technologies embodied in the products of the wood processing industries may be important cluster-specific inputs to the production of a wood cluster's core products. The chemical industries may provide glue and coating technologies, the IT industry CAD/CAM and CNC-milling technologies etc. The local presence of new technology suppliers facilitates supplier-user communication and cooperation through developing, prototype testing and fine-tuning of new technologies. Local specialized knowledge-intensive business services (KIBS) facilitate the transfer of technological and business skills. Sectoral innovation policy must account for the specific innovation system requirement defined by the scientific and technological knowledge base, strategies, resources and competences of its actors. These policy challenges extend to national and regional innovation policies implying consistency with sector priorities.

## 7. Policies fostering innovation performance in traditional low-tech industries

Clusters constitute favourable innovation environments by functional, social and geographical proximities and related innovation systems support. SMEs traditionally avoid investments into R&D due to high uncertainty and the lengthy repayment period. They lack of knowledge about innovation opportunities and insufficient entrepreneurial capacity. Regional and local innovation system support is important for improving innovation performance among SMEs that learn mainly by interactions with actors at the same location. Innovation activities among low tech SMEs are not performed in isolation, but rather through cooperation with other firms and KIBS providers (Rametsteiner, 2000). Support on existing and new networks is needed to foster the innovative performance. This is due to the knowledge and competency inferiors thus addressing needs to create cooperation arrangements. Systemic approach in wide innovation policy prefers public-private partnerships and collaboration between firms and external partners in the research sector. Policies concerning cross-sectoral interaction and co-operation address the lock-in situations in mature industries. Cluster initiatives and technology platforms are among the recent network-facilitating policy tools (Reid and Peter, 2008). Innovation policy favouring cluster-based national implementation can be identified in the background of cluster specified centres of expertise, science parks but also regional development agencies (Regional Clusters). These institutions are addressed by definition to enhance cluster based policies on regional level. Technopoles and industrial villages represent examples of institutions providing new channels for local innovation networks to cross over the traditional cluster boundaries.

Clusters can provide positive innovation environment through functional, social and geographical proximities. Innovation system support has to be taken into account because SMEs avoid investments into R&D due to high uncertainty and the lengthy repayment period, lack of knowledge about innovation opportunities and insufficient entrepreneurial capacity. Financial support from national or regional institutions to policy implementation can compensate excessive competitive pressure and ease entries related competence building. Regional and local innovation system support is important for improving innovation performance among SMEs that learn mainly by interactions with actors at the same location. Their learning capabilities are very much characterized by direct social interaction and collaboration with other firms or non-firm organizations in the same region or locality. Knowledge relevant for them is typically non-

codified and transferred by face-to-face communication. Therefore cultural, institutional and social structures are important for the flow of information among firms and their learning capabilities (Malmberg and Maskell, 2006). An innovation system supporting these firms, therefore, must target on fostering local learning processes (Asheim and Isaksen, 2002).

Shift from a production-focused strategy towards customer-derived business models is of major concern when progressing innovation system supports. The organisational innovation initials among wood product SMEs mean more intensive downflow integration in the value chain. The latter cover customer interface inclusion through vertical collaboration along the supply chain (Rimmler et al. 2006). Competitive strategies in low-tech industries rely on innovation activities moving within a spectrum of incremental innovations and architectural innovations respectively (Hirsch-Kreinsen, 2006). Architectural innovations modify partitioning among system elements and interfaces. Timber frame building system, applying industrialized manufacturing methods, provides an example of architectural innovation potentials to be proceeded with a structural system for wood products: timber truss, panel, volumetric or platform frame. The architectural superiority of these systems relates to the redefinition of work shares within a production network. Their main objectives among the firms in the downflow, construction companies, are in the reduced costs of manufacturing and work on-site. An architectural innovation is not only a technical innovation but imply new working patterns and linkages between the actors in a value network (Ollonqvist, 2008).

Architectural innovations are also new designs and techniques to combine different types of raw materials, such as wood, steel and polymers. The furniture industry is a domain of architectural innovation in this respect. An investment in a new process technology may enable sawmills to produce sawn products in new dimensions (Stendahl, 2009). Operational efficiency, customer responsiveness and quality are all important building blocks of successful strategies in those industries. Rearrangements in inbound and outbound logistics are necessary if customer responsiveness, just-in-time delivery system, is aimed to be improved (Schienstock and Hämäläinen, 2000). Productivity and product quality enhancing investments through step-by-step technological advances within established generic technological concepts are necessary in order to stay in the present market and at the same time safeguard progress in productivity cost effectiveness. (Schienstock and Hämäläinen, 2000). A constant inflow of new technologies into mature industry firms keep on the necessary continuous productivity improvement. Sophisticated suppliers of technical components, machinery, tools or software are highly important for the diffusion of these new technologies (Pavitt, 1984). The creation of cross-sectoral linkages is an important mean to foster the transfer and application of generic technologies such as ICT and other state-of-the-art technologies (Bloch, 2005).

The strengthening of linkages between innovation system actors is a major policy concern. Policy means should be targeted at:

1. Systemic, more formally organized and continuous interaction between different stages of the innovation process from research to marketing,
2. Partnerships between industry, science and the governmental sector, and at
3. Inter-firm collaboration along value chains.

Questions of concern for policy makers are:

1. How to create a science-based innovation potential,
2. How to transfer and implement new technologies and
3. How to remove barriers to market entry and to foster new entrepreneurial entrances in these industries (see e.g. Arnold and Thuriaux 1997; Georghiou et al. Evaluation of the Finnish Innovation System, Ministry of Trade and Industry, Finland, publication 5/2003).

## 8. Conclusions and discussion on enhancing innovation capabilities among low tech industry SMEs

The European Union's Lisbon Strategy addresses innovative capacity as a major tool to strengthen competitiveness of industries and businesses in global market conditions. Innovation support has thereafter acknowledged as one of the key factors of industrial competitiveness in practical industry policy postulations. The inefficient use of new knowledge among SME managers, identified frequently as incomplete KIBS use, is a specific policy implementation challenge (Capaldo et al. 2004).

Innovation policy implementation can benefit from parallel regional and rural policy activities when low tech industry SMEs are in policy focus. The managers of SMEs ask for supplementary knowledge and expertise for their innovation processes. The supply of these services can be arranged into regional and rural policies because of their extensive validity when industries are concerned. SME managers are accustomed to use local technology knowledge and are in many ways dependent on embedded local supply of KIBS. The day to day managerial burden among low tech industry SME managers make them to prefer the local market presence of KIBS due to the low transactions costs for the use of the services. The limited absorptive capacity among low tech industry SME managers to adopt high-tech knowledge and best practice solutions can be improved through the supply of KIBS. The use of these services can improve innovation-enabling capabilities among SME managers thus easing identification of new market solutions and value chains positioning. These framework conditions related to both demand and supply of knowledge and competencies must be indentified and adopt in parallel actions into the implementation of innovation-, regional- and rural policies. The regional and local service supply of complementary knowledge and competence demand is needed to strengthen innovation capabilities among forest industry SMEs.

Resources provided through SIS are the major source for the scientific and technological research knowledge creation allowing also R&D output distribution outside the firm specific secrecy conditions available. The improved policy coordination improving R&D output distribution could create potentials for individual firms to use them as complementary local knowledge base. These programs are also tools for the creation and development of technologies and value chain specific product and process solutions. The action programs focusing on traditional sectoral technology improvements need funding schemes, (a) to finance consortia between academia and public research organisations to provide open source scientific knowledge, (b) to allow private-public partnerships aiming at organisational and marketing innovations by single or groups of enterprises (c) to enhance DUI competencies related to these innovation processes.

The concept of systemic innovation pays special attention to the interdependencies between the innovating firm and its external environment (Schienstock and Hämäläinen, 2000). Systemic innovation approach provides comprehensive view on the regional and local coordination and integrating policy actors to understand SME specific innovation processes, activities and institutional framework conditions. The evaluations concerning absorptive capacity deficiencies and demand and supply conditions related to innovation-enabling capabilities would help policy stakeholders responsible for horizontal and vertical policy coordination to improve policy incidence supporting successful marketing and organizational innovation activities among SMEs.

Tools facilitating network creation are becoming important in national innovation policies. There are cluster environment needs but also vertical value chain needs to build up more profitable cluster networks and value chains. Policy integration needs has challenges to integrate functional, social and geographical proximity needs in the network facilitation.

Process re-engineering in wood frame residential construction is an actual example where integrated policy is needed to build up integrated vertical supply chains connecting wood frame technology needs to real estate and construction sector needs in lean construction. International Group for Lean Construction has stated the principles of lean value creation in construction covering: project definition and design management, production system design, prefabrication, assembly and open building, lean within ICT, safety, quality and environment, contract and cost management.[1] Erabuild has carried out standardization and information tools towards international open standards and neutral technology (Erabuild, 2008). The coordinated task aims to enable efficient information flow during the complete lifecycle of the building and International Alliance for Interoperability (IAI) outputs to provide sustainable tools for information & communication management to be applied in construction and facility management & repair activities and provide access to that information for the participating members. Erabuild network applied Building Information Modelling (BIM), covering Architecture, Engineering and Construction (AEC) model targets to be delivered with digital representations for communication among the building activity partners. BIM facilitates information exchange and interoperability in digital format with 2D or 3D representations in those CAD-oriented systems used in Europe.

The coordinated inflow of new and sophisticated technologies into mature industries is important to keep up the process of continuous productivity improvements among them. Sophisticated suppliers are highly important as providers of new technologies. Firms with a changing business strategy indicated by a cross-over between groups need special attention from policy makers. New and sophisticated technologies are equally important for the rejuvenation of mature industries.

[1] See http://www.iglc.net/.

## 9. References

Arnold, E. and Thuriaux, B. (1997) Developing Firms' Technological Capabilities. Report to OECD, Brighton: Technopolis.

Arthur, W.B. (1989) Competing technologies, increasing returns and lock-ins by historical events. Economic Journal. 99, 116-131

Asheim, B. and Isaksen, A. (2002) Regional Innovation Systems: The Integration of Local 'Sticky' and Global 'Ubiquitous' Knowledge. Journal of Technology Transfer, 27, 77-86

Bauer, A. (2006) Integrating Innovation and Development Policies for the Forest Sector. Background Paper – Policy Integration and Co-ordination

Bender, G. and Laestadius, S. (2005) Non-science based innovativeness – on capabilities relevant to generate profitable novelty. Proceeding paper contributing to the conference "Low-tech as misnomer: The role of non-research-intensive industries in the knowledge economy. Brussels, 29.-30. June, 2005.

Bender, G. (2006) Peculiarities and Relevance of Non-Research-Intensive Industries in the Knowledge-Based Economy. Final Report of the Project PILOT. http://www.pilot-project.org

Bloch, C. (2005) Innovation measurement: present and future challenges. Proceeding paper prepared for the Eurostat Conference, "Knowledge Economy – Challenges for Measurement" Luxembourg, Dec. 8-9, 2005.

Bull, L. and Ferguson, I. (2006) Factors influencing the success of wood product innovations in Australia and New Zealand. Forest Policy and Economics, 8, 742-750

Cao, X. and Hansen, E. (2006) Innovation in China's furniture industry. Forest Products Journal, 56, 33-42

Capaldo, G., Landoli, L. and Ponsiglione, C. (2004) Value creation in small firms: a competence-based approach. Conference Proceedings "Value creation in entrepreneruship and SMEs", 20-23 September 2004, University of St. Gallen. http://www.kmu.unisg.ch/rencontres/RENC2004/Topics/Capaldo_Renc_2004_Topic_A.pdf

Cohen, W. and Levinthal, D. (1990) Absorptive Capacity: A New Perspective on Learning and Innovation. Administrative Science Quarterly, 35, 128-152

Communication on Industrial Policy in an Enlarged Europe. Commission of the European Communities.11.12.2002. COM (2002).

Georghiou, L., Smith, K., Toivonen, O. and Ylä-Anttila, P. (2003) Evaluation of the Finnish Innovation Support System. Ministry of Trade and Industry, Finland, publication 5/2003.

Greenpaper on Innovation. European Commission 1995 http://europa.eu/documents/comm/green_papers/index_en.htm

Hansen, E., Korhonen, S., Rametsteiner, E. and Shook, S. (2006) Current state of knowledge: innovation research in the global forest sector. Journal of Forest Products Business Research, Vol 3.

Hansen, E. (2006) The state of innovation and new product development in the North American lumber and panel industry. Wood and Fiber Science, 38, 325-333

Hirsch-Kreinsen, H. (2006) Low-Technologies: A forgotten sector in Innovation Policy, Paper presented at the ProAct Conference "Innovation Pressure", 15-17th March 2006, Tampere/Finnland.

Hovgaard, A. and Hansen, E. (2004) Innovativeness in the forest products industry. Forest Products Journal, 54, 26-33

Innovation tommorrow. Innovation policy and the regulatory framework: Making innovation an integral part of the broader structural agenda. Louis Lengrand & Associes. PREST University of Manchester. Innovation papers No 28. (2002) Directorate-General for Enterprise. 219. ftp://ftp.cordis.europa.eu/pub/innovation-policy/studies/studies_innovation_tomorow.pdf

Kiviniemi, A., Tarandi, V., Karlshøj, J., Bell, R. and Karud, O. (2008) Erabuild 2008 – Review of the Development and Implementation of IFC compatible BIM http://www.bic.nu/documents/public/Erabuild_BIM_Final_Report_January_2008.pdf

Korhonen, S. (2006) A capability-based view of organizational renewal: Combining opportunity and advantage-seeking growth in large, established European and North American wood-industry companies. Doctoral dissertation. Faculty of Agriculture and Forestry. University of Helsinki

Lagendijk A. and Charles, D. (1999) Clustering as a new growth strategy for rregional economies?. A discussion of new forms of regional industrial policy in the United Kingdom. In: Boosting Innovation. The Cluster Approach. OECD Proceedings 418, 127-153

Langlois, R and Robertson, P. (1995) Firms, Markets, and Economic Change: A Dynamic Theory of Business Institutions. London.

Lankhuizen, M. and Klein Woolthuis, R. (2003) The National Systems of Innovation Approach and Innovation by SMEs. Research Report H200309. Report by EIM Business & Policy Research published under the SCALES-initiative.
http://english.eim.nl/index.cfm/4,html

Lorenzen, M. (1999) Regional competitiveness, localised learning, and policy. Workingpaper No: 99-13. Dept. of Industrial Economics and Strategy. Copenhagen Business School. http://swopec.hhs.se/iivswp/abs/iivswp99-13.htm

Lundvall, B.-Å. (ed.) (1992) National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning, Pinter Publishers, London.

Lundvall, B.-Å., Borrás, S. (2005) Science, technology, and innovation policy. In: Fagerberg, J., Mowery, D.C. and Nelson, R.R. (eds.) 2005. The Oxford handbook of innovation, 604-612

Lundvall, B.-A., Johnson, B., Andersen, E.S. and Dalum, B. (2002)National systems of production, innovation and competence building. Research Policy, 31, 213-231

Morgan, K. (1995) The Learning Region: Institutions, Innovation and Regional Renewal. Regional Studies, 31.5, 491-503

Ollonqvist, P. (2008) Business and Innovations in Wood Frame Construction – Cross-Sectoral Policy Challenges in Finland. in: Bergseng, E., Delbeck, G. and Hoen, H.F. (eds.). Proceedings of the Biennial Meeting of the Scandinavian Society of Forest Economics. Lom, Norway, 6th-9th April 2008. Scandinavian Forest Economics 42.

Palmberg, C. (2001) Sectoral patterns of innovation and competence requirements – a closer look at low-tech industries. Sitra Reports series 8.

Pavitt, K. (1984) Key characteristics of large innovating firms. Handbook of industrial innovation, pp. 357-366

Rametsteiner, E. (2000) Innovation and entrepreneurship research in forestry: Definitions, key questions and measurement approaches used for the EFI Regional Project Centre INNOFORCE.

Reid, A. and Peter, V. (2008) Sectoral innovation systems: The policy landscape in the EU 25. http://www.europe-innova.org/servlet/Doc?cid=9894&lg=EN

Rimmler, T., Cooper, R. and Ollonqvist, P. (2006) Market entry barriers, strategies and innovation in industries of the structural wood products supply chain. In.(Niskanen, A. Ed.). 2006. Issues affecting enterprise development in the forest sector in Europe. University of Joensuu, Faculty of Forestry, Research Notes 169, pp. 175-233

Ruud, A. and Larsen, O. (2004) Coherence of Environmental and Innovation Policies: A green innovation policy in Norway? Working Paper. Report of the MONIT (monitoring and implementing horizontal innovation policy) project.
http://www.step.no/monit/

Schienstock, G. and Hämäläinen, T. (2000) Transformation of the Finnish innovation system: A network approach. Sitra Reports series 7.

Stendahl, M. (2009) Product Development in the Wood Industry – Breaking Gresham's Law. Acta Universitatis agriculturae Sueciae, 2009:3, Uppsala

Teece, D. and Pisano, G. (1994) The dynamic capabilities of firms: An introduction. Ind. and Corp. Change, 3, 537-556

Tunzelmann, N. and Acha, V. (2004) Innovatoin in low-tech industries. In: Fagerberg, J., Mowery, D.C. and Nelson, R.R. (eds.). The Oxford handbook of innovation, pp. 407-432. Oxford University Press 2005.

Wagner, E. and Hansen, E. (2005) Innovation in large versus small companies: insights from the U.S. wood products industry. Management Decision, 43, 837-850

Chapter IV

# Integrating Innovation in Forest and Development Policies: Comparative Analysis of National Policies across Europe

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## 1. Introduction

The COST Action E51 "*Integrating Innovation and Development Policies for the Forest Sector*" aims at developing knowledge that enables the coordination of innovation and development policies for a more effective and sustainable development of the forest sector. In course of the Action, seven policy areas were analysed that are relevant for supporting innovation in the forest sector. For each policy area, a central policy document was chosen for a detailed analysis. The analysis followed common guidelines and was done by national experts. The following policy areas were covered:

1. Forestry policy
2. Forest based industries policy
3. Innovation policy
4. Rural development policy
5. Regional development policy
6. Sustainable development policy
7. Renewable energy policy

This article compares the policy documents that were analysed in the country reports. The following 19 countries are included in the analysis: Austria, Bulgaria, Switzerland, Cyprus, Czech Republic, Germany, Estonia, Finland, France, Croatia, Italy, Lithuania, Norway, Poland, Portugal, Romania, Slovakia, Sweden, United Kingdom/Scotland.

The main research questions underlying this analysis report were the following:

- In how far and in which way is innovation dealt with in the different policy areas?
- In how far are the policy areas coordinated?

## 2. Definitions and operationalisation of the key concepts: integration and coordination

The presented paper is based on the background paper for the COST Action E51 which aims at clarifying the two concepts policy integration and policy coordination (Bauer and Rametsteiner, 2007) and the theoretical-conceptual chapter 2 of this book. The COST Action E51 is built around two core questions:

1. In how far is innovation policy integrated in forest policy, forest sector policy, in rural, regional and sustainable development policies?
2. In how far is forest policy co-ordinated with related policy areas such as forest sector policy, rural, regional and sustainable development policies, innovation policy and sectoral policies such as tourism policy, nature conservation policy, energy policy, etc.?

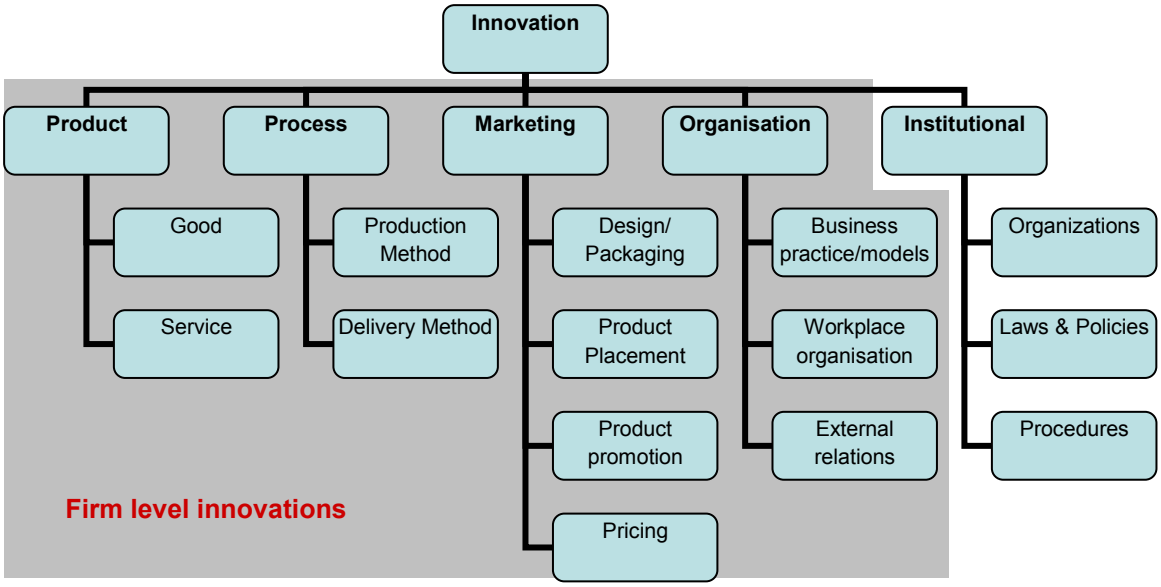


**Figure 1**. Typology of Innovation – modified from OECD 2005

The guidelines for the preparation of the country reports (Annex 3) included the following key definitions of terms and concepts.

### *2.1. Innovation and innovation types*

The participants of the COST Action agreed to use the OECD definition of innovation as reference for the work within the COST Action. The OECD (2005) defines innovation in its Oslo Manual[2] as "*[…] the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations.*"

The minimum requirement for an innovation is that the product, process, marketing method or organisational method must be *new to the firm (or significantly improved)*. A common feature of an innovation is that it must have been *implemented* on the market or when it is taken into use by customers.[3] New processes, marketing methods or organisational methods are implemented when they are brought into actual use in the firm's operations (OECD, 2005). The Oslo Manual distinguishes four main types of innovation – product, process, marketing and organisational innovations – which are further sub-divided. We further add institutional innovation as a separate category (see Figure 1).

A product innovation is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics.

A **process innovation** is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software.

A **marketing innovation** is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.

An **organisational innovation** is the implementation of a new organisational

[2] *Source*: OECD 2005: Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, 3rd Edition.
[3] This includes also innovations in public goods that are not marketed goods and services. Further it includes such goods and services that are offered by for example public entities, are used but are not paid for by consumers. For example, mountain bike routes in some countries are paid for, in others they are offered for free.

method in the firm's business practices, workplace organisation or external relations. An organisational innovation is the result of strategic decisions taken by management. Business model innovations would be included under this category.

Besides the above classified types of innovation that refer to innovations on a firm level, the concept of **institutional innovations** is of increasing relevance when analysing policies and institutions. Institutions are understood here to denote "the rules of the game". Institutional innovations refer to innovations in the public/policy sphere. Institutional innovations may include new or adaptation of existing organizations, new or significantly modified rules as laid down in laws, decrees or policies as well as new or significantly modified procedures in developing and implementing policies.

### *2.2. Innovation policy and innovation support*

The understanding of innovation policy has considerably changed over the last decades and varies from country to country. The two dominating approaches are the traditional science and technology policy approach as it was prevailing in most OECD countries in the post war period and the systemic innovation policy approach that has gained increasing importance during the last two decades.

1. **Traditional science and technology policy approach**: The traditional science and technology policy approach is ideal typically characterised by the following elements:
   - A basic understanding of innovation processes as being linear, starting with laboratory science and moving through successive stages until new knowledge is built into commercial applications that diffuse in economic systems.
   - Innovation is seen as the end of research and development processes (solely).
   - Policy focuses on fostering critical directions of scientific and technological advance, and enhancing the flow of knowledge down along the innovation chain (Lengrand et al. (2002).
   - There is a distinct role for education/university ministries and economy/industry ministries dealing with innovation as a tool for encouraging investment and modernizing firms.
   - Main policy instruments include:
     - Public financing of research in universities and public research institutions,
     - Subsidies to industrial R&D, and
     - Securing intellectual property rights through more embracing and enforceable patents.

2. **Systemic innovation policy approach** is ideal typically characterised by the following elements:
   - Understanding of innovation as a complex process, taking place in an environment of interacting actors and institutions (innovation system); having multiple sources (apart from research activities); and running through multiple feedback loops between the different stages.
   - Policy approaches the systemic environment in which innovation take place in ways that can better inform decisions about research, commercialisation, technology adoption and implementation, etc.
   - The role of policy is to solve problems that occur within innovation systems, e.g. by supporting the creation and development of institutions and organisations, supporting network development, facilitate transition and avoid lock-in (Edquist and Johnson, 1997).
   - Policy instruments are not only directed to individual organisations (e.g. research and development subsidies, management support) or bilateral relations (e.g. knowledge transfer), but also to the innovation system as a whole (e.g. managing interfaces and organising learning platforms) (Goorden, 2004).
   - The scope, scale and actors of innovation policy are widened. Innovation policy is no longer limited to the economic domain but is placed on the agenda of

various policy domains, such as industrial policy, policies for science and technology, education, health, ICT and other sectoral policies.

In reality, mixes of the two policy approaches are observed within one and the same ministry or document. Some may rely mostly on the traditional approach while others may have changed their policy and institutions towards the systemic innovation policy approach.

Innovation support can take many forms from direct funding of research and development activities to the support of the diffusion of innovations, to improving the knowledge base and interaction of actors, to adapting framework conditions. Some of these support measures are targeted directly at fostering concrete innovation activities, others are of structural character. These measures may be introduced without the explicit aim of fostering innovation. For the analysis of the documents measures along the following six categories of innovation support are distinguished:

1. **Research and Development**: This includes innovation support in a narrower sense, i.e. financing of basic and applied research, development of new products or processes, pilot projects, demonstration projects and support for the commercialization of innovations. Support for Research and Development generally aims at innovations new to the sector (forest sector), i.e. products, processes, marketing and organisational methods that have not been introduced to a particular sector in a particular country before. Throughout the document analysis the following sub-categories of Research and Development will be applied:
   - Enterprise research, i.e. support for applied research in the enterprise or in co operation of enterprise and science organisations,
   - Development of new products, processes, marketing methods, organisational models by enterprises,
   - Pilot projects and demonstration projects,
   - Commercialization of new products by enterprises.

2. **Diffusion of innovation**: This includes support for the early and broad adoption of named, already known goods, services and processes by enterprises in a sector in a specific country. It excludes support to standard managerial processes or late adoption (e.g. species diversity support or road building in forestry or standard IT in SMEs). Throughout the document analysis the following sub-categories of diffusion support will be applied:
   - Diffusion of products (for example subsidies for bio-energy installations; support of the introduction of recreational facilities),
   - Diffusion of processes (for examples investment support for the acquisition of significantly new machineries/technologies, incl. advanced information technology for production or logistics, etc.),
   - Diffusion of marketing methods (e.g. addressing new customer groups, market segments),
   - Diffusion of organisational models (e.g. financial or informational support for the establishment of co-operations).

3. **Human resources development**: The innovation capabilities of a firm, a sector or an economy among others strongly depend on the availability and quality of human capital, i.e. individual know-how, skills and motivation of entrepreneur and employers, level of qualification and competencies of employers. Further, the access to and exchange of information and knowledge influences the innovation propensity as well. The following activities are examples of how to strengthen the innovative human resource development:
   - Integrating innovation in education, e.g. new educational curricula,
   - Strengthening further/vocational training,
   - Addressing shortages of scientists and engineers in particular fields,
   - Integrating innovation in extension services,

- Promoting mobility of high-skilled personnel,
- Promoting mobility between science and practice.

4. **Promoting interaction / managing interfaces**: Firms do not innovate in isolation. Rather a range of other actors/ organizations contribute in different ways to innovations, e.g. other firms/competitors, research organisations, extension services, interest groups, etc.. Policy may foster innovation by strengthening the interaction between different key actors in the forest sector, among others through:
   - Promoting horizontal co-operation – between forest holdings,
   - Promoting vertical co-operation – along the forestry wood chain,
   - Promoting public – private partnerships,
   - Promoting co-operation across sectors,
   - Promoting university/research institutions – enterprise co-operation,
   - Promoting interaction with users (customers and consumers).

5. **Public demand creation for innovation**: The demand side is crucially important for the promotion of innovations. Policy may not only promote innovations by supporting the input-side but also by inducing demand for innovation. This is often applied in the case of environmental/sustainable innovations. The following activities may be implemented to strengthen the demand for innovation:
   - Reorientation of public procurement policy (creating consumer demand),
   - Support for lead users, or public agencies acting as lead user,
   - Clear demand expression through communication.

6. **Institutional environment and surrounding**: General framework conditions including institutions such as laws, regulations, standards, taxes or the access to financing have a crucial influence on firms' decisions to innovate. Changing framework conditions is often not in the responsibility of sectoral policies. The following list comprises a selection of policy activities to improve framework conditions for innovation:
   - Institutional reforms, e.g. change of forest law, property rights reform, support for the establishment of new organisations,
   - Adaptation of tax laws, e.g. corporate taxes,
   - Improving access to financing, e.g. by providing guarantees,
   - Adaptation of standards and norms, e.g. in the construction sector.

### *2.3. Policy co-ordination*

Besides the integration of innovation in different policies, the COST Action aimed at analysing the co-ordination of different sectors in policy formulation and implementation. With regard to the formulation phase, cross-sectoral co-ordination is analysed with regard to public organisations and stakeholders from the private field.

For the assessment of **coordination among public administration** it was asked if the policy documents were coordinated
- Between different sections / departments within the same ministry,
- Between different ministries, or
- Between ministries and other public organizations or agencies (multiple answers were allowed).

The assessment of the **participation of stakeholders** refers to the involvement of private, mostly organized, actors in political processes. Stakeholder involvement can take various forms from consultation processes via written statements to the inclusion of stakeholders in formal bodies and decision making processes. For example the National Forest Programme is elaborated in most European countries with the participation of stakeholders.

The **mechanisms of co-ordination** were assessed with regard to the following

categories: existence of a formal central coordination body, a coordination process, working group, advisory body or a consultation process. Informal co-ordination was not considered in the analysis because this category could not be covered by the survey (not interviews were done).

With regard to the **implementation process** the questionnaire asked at which level of administration the policy is implemented, including a devolution to private actors. Possible levels include decentralized or central implementation, delegation to private actors, local or regional implementation or other forms.

### *2.4. Two innovation fields*

The innovation fields in the forest sector where – just as the two COST Action E51 Working Groups – divided into two broad categories: territory-based services and wood related value added chains.

1. **Territory-based services**: Under territory-based services of the forest we understand the many benefits that forests provide to the society which are not commodities and which are typically connected with the land area. They are often called ecosystem services or non-wood/non-timber forest goods and services, in fact those goods and services besides of wood/timber. They include recreation and tourism, health and well-being related services, and environmental and protective services, including biodiversity conservation and carbon sequestration. Innovations may be new products or processes, marketing, organisational models or institutional arrangements that are connected with the provision of these goods and services.

2. **Wood related value added chains**: We look at innovations related to the production chains in the wood working industries, including timber and other wood products such as biomass that is, e.g. used for energy production. The same types of innovation as above are included.

## 3. Material and methods

The documents that are studied in this report were analysed by country expert teams the members of which participate in COST Action E51. The data collection was done on the basis of common guidelines that were developed in course of the COST Action work and agreed in early 2007. The final reports were collected and analysed between autumn 2007 and summer 2008. The guidelines as well as the country reports have been published on the COST Action E51 website.[4] The guidelines are also given in Annex 3 and the list of documents that were included in the analysis is given in Table 1.

In the field of forest policy, 18 policy documents were included in our analysis. For the following 12 countries, National Forest Programmes (NFP) or similar documents were available: AT, BU, CH, CY, CZ, DE, FI, FR, PL, PT, RO and SK. For the following four countries, national forest policies and strategies were analysed: HR, LT, NO, Scotland (UK). For Swedish forest policy, the evaluation/adjustment of the Forest Act (a governmental paper) was analysed, for Italy the guidelines for forest sector planning (ministerial decree).

For forest-sector industry, policy programmes or strategies were available from 15 countries. In the other countries such public policy papers do not exist. In the field of innovation policy, 18 documents were analysed: 8 National Reform Programmes that are required by the EU, and ten other national innovation strategies. 18 rural development policies were available, 13 of which in the framework of the EU Rural Development Programme, two in the framework of the EU SAPARD programme, and three similar programmes. 17 regional development plans were analysed, most of them in the framework of EU Regional Development Programme (national strategic framework plans). 18 strategy documents for sustainable development were analysed, eight of which being National Strategies for Sustainable Development as required by the EU.

[4] See http://www.boku.ac.at/coste51.

**Table 1. Documents used in the comparative analysis**

| Country | Forest programmes | Forest-based sector strategies | Innovation programmes | Rural development programmes | Regional development programmes | Sustainable development strategies | Renewable energy strategies |
|---|---|---|---|---|---|---|---|
| **AT** | Austrian Forest Programme | None | Austrian Reform Programme | Special Guidelines for the Implementation of "Other Measures" of the Austrian Programme for Rural Development 21.200/50-II/00 | STRAT.AT – National Strategic Framework Plan Austria 2007-2013 | Austrian Strategy for Sustainable Development | National Biomass Action Plan for Austria (draft) |
| **BG** | National Strategy for the Sustainable Development of Forest Sector in Bulgaria, 2006-2015 | National Strategy for the Sustainable Development of Forest Sector in Bulgaria, 2006-2015 | Innovation Strategy of Bulgaria and Measures for its Implementation | National Strategic Plan for the Rural Development, 2007-2013 | Regional Development Strategy of the Republic of Bulgaria for the period 2005-2015 | Operational programme "Environment 2007-2013" | National Long-Term Program for Energy Effectiveness up to 2015 |
| **CH** | SAEFL 2004: Swiss National Forest Programme (Swiss NFP) | None | Education, research and innovation 2008-2011. Sustainably securing and improving quality. Increasing competitiveness and growth. The Federal Council's proposed guidelines, goals and funding. Bern 2007. | Message of the Federal Council on Agricultural Policy 2011 | Message by the Federal Council on the New Regional Policy | Sustainable Development Strategy 2002, report dated 27 March 2002. Bern: Interdepartmental Rio Committee (IDARio) c/o Federal Office for Spatial Development (ARE) | Energy Perspectives 2035 – Vol. 1 Synthesis |
| **CY** | National Forest Programme of Cyprus | None | National Lisbon Programme of the Republic of Cyprus | Program for Rural Development 2007-2013 (Greek Document) | Strategic Development Plan 2004-2006 | Not available | Renewable Energy Policy of Cyprus |
| **CZ** | National Forestry Policy and Strategy | Operational Program for the Development of the Wood Processing Industry | Science&Technology Policy of the Republic of Croatia 2006-2010 | SAPARD programme – Agriculture and Rural Development Plan 2004-2006 | Strategy of Capacity Building for Regional Development | Strategy and National Environmental Action Plan | Energy Sector Development Strategy of the Republic of Croatia |

| Country | Forest programmes | Forest-based sector strategies | Innovation programmes | Rural development programmes | Regional development programmes | Sustainable development strategies | Renewable energy strategies |
|---|---|---|---|---|---|---|---|
| **DE** | National Forest Programme | Charta for Wood | National Reform Programme Germany, 2005-2008 | National Strategic Plan for Rural Development 2007-2013 | at national level same as rural development policy | National Strategy for Sustainable Development | The federal government will produce an energy policy strategy in the second half of 2007 |
| **EE** | Not provided | Not provided | THE ESTONIAN RESEARCH AND DEVELOPMENT AND INNOVATION STRATEGY 2007-2013 | Estonian Rural Development Strategy 2007-2013 | Regional development strategy of Estonia 2005-2015 | Long-term Development Programme for the Estonian Fuel and Energy Sector up to year 2015 | Not provided |
| **FI** | National Forest Programme 2010. Follow-up report 2004. (Draft) | Woodworking Industrial Programme 2004–2010 | Science, Technology and Innovation. Science and Technology Policy Council of Finland 2006 | Rural Development Programme for mainland Finland 2007-2013 | The Lisbon Strategy for Growth and Jobs – The Finnish national Reform Programme 2005-2008. 3b/2005 | Towards sustainable choices. A nationally and globally sustainable Finland. The national strategy for sustainable development. | Outline of the Energy and Climate Policy for the Near Future – National Strategy to Implement the Kyoto Protocol |
| **FR** | National Forest Programme | French wood sector – Competitiveness as a stake of the sustainable development-"Juillot" report | Innovation and technology research, Situation December 2005 | National rural development plan (PDRH) | Inter-professional contract for forest and wood sector in Burgundy | National Strategy of Sustainable development | Wood Energy National Programme 2000-2006 (ADEME) |
| **HR** | National Forestry Policy and Strategy | Operational Program for the Development of the Wood Processing Industry | Science & Technology Policy of the Republic of Croatia 2006-2010 | SAPARD programme – Agriculture and Rural Development Plan 2006 | Strategy of Capacity Building for Regional Development | Strategy and National Environmental Action Plan | Energy Sector Development Strategy of the Republic of Croatia |
| **IT** | Guidelines for forest sector planning and programming – Decreto 16.6.2005 | Strategic programme for valorisation of forest and mountain resources – autonomous province of Trento | PICO-Italian programme for innovation, growth and occupation (Lisbon strategy) | Rural development program Veneto Region | Operative regional programme Veneto Region | National Plan for Sustainable Development – implementation of agenda XXI; National Found for Sustainable Development: Annual programs of activity | National programme for forestry and agricultural biomass valorisation |

| Country | Forest programmes | Forest-based sector strategies | Innovation programmes | Rural development programmes | Regional development programmes | Sustainable development strategies | Renewable energy strategies |
|---|---|---|---|---|---|---|---|
| **LT** | Lithuanian Forestry Policy and its Implementation Strategy. The Ministry of Environment of the Republic of Lithuania; Order No 484, 17-09-2002 | The Vision of National Forestry Sector Technology Platform of Lithuania. of Minutes of the National Forestry Sector Technology Platform Forum; 30-01-2007 | The National Lisbon Strategy Implementation Programme of Lithuania (2005-2008). The Government of the Republic of Lithuania; Resolution No 1270, 22-11-2005 | The National Rural Development Strategy 2007-2013. The Ministry of Agriculture of the Republic of Lithuania; 27-07-2006 draft | Regional policy strategy of Lithuania until 2013. The Government of the Republic of Lithuania; Resolution No 575; 23-05-2005. | National Strategy for Sustainable Development. The Government of the Republic of Lithuania; Resolution No 1160; 11-09-2003 | The National Energy Strategy. Seimas (Parliament) of the Republic of Lithuania; Resolution No X-1046; 18-01-2007. |
| **NO** | Value-Added and biodiversity. New possibilities in the forest sector | Forest Resources in Norway 2006. Possible strategies to increase cutting | The EU Lisbon Strategy – A Norwegian Perspective | The Rural and Regional Policy of the Norwegian Government. White Paper to the Parliament, No. 21 (2005-2006) | The Rural and Regional Policy of the Norwegian Government. White Paper to the Parliament, No. 21 (2005-2006) | National Agenda 21. National Action Plan for Sustainable Development | National Budget 2007. "For budsjettåret 2007, Olje og energidepartementet" |
| **PO** | National Policy on Forests | Concept of horizontal industrial policy in Poland Concept of horizontal industrial policy in Poland | Innovative Economy Operational Programme | RURAL DEVELOPMENT PROGRAMME for 2007-2013 | National Cohesion Strategy 2007-2013 – Draft (approved by the Council of Ministers on 14 February 2006) | Poland 2025 Long-term Strategy for Sustainable Development | Energy Policy of Poland until 2025 |
| **PT** | Action Plan for the Forest Sector | National Strategy for the Forests | Technological Plan – A Strategy of Growth Based on Knowledge, Technology and Innovation | National Strategic Plan – Rural development) | Regional Operational Programmes for the North, Centre, Lisboa, Alentejo, Algarve 2007-2013 | National Strategy for the Sustainable Development | National Strategy for Energy – support documentation |
| **RO** | National Forest Programme | National Strategy for Forest Sector Development (Politica si Strategia de dezvoltare a silviculturii din Romania – 2001-2010 | None | None | None | National Development Plan 2007-2013 | none |

| Country | Forest programmes | Forest-based sector strategies | Innovation programmes | Rural development programmes | Regional development programmes | Sustainable development strategies | Renewable energy strategies |
|---|---|---|---|---|---|---|---|
| **SK** | National Forest Programme | Innovation strategy for the Slovak republic 2006-2013 | National reform programme of the Slovak republic 2006-2008 | | Regional Operational Programme 2007–2013 | National Strategy for Sustainable Development for the Slovak Republic | Energy Policy of the Slovak Republic |
| **SWE** | Evaluation of the Forest Policy | The Forest Industry – A part of Innovative Sweden | The Swedish Reform Programme for Growth and Jobs 2006-2008. Prop 2006/07:23 | Revised Rural Development Program for Sweden, 2007-2013 | A national strategy for regional competitiveness, entrepreneurship and employment 2007-2013 | Strategic challenges – A further elaboration of the Swedish Strategy for Sustainable development | National climate policy in global cooperation (Prop. 2005/06:172) |
| **UK/Sco** | Scottish National Strategy | Roots for Growth – A Strategic Framework for Action for the Scottish Forest | Smart Successful Scotland | Rural Scotland: Better Still, Naturally | none | Choosing our future: Scotland's Sustainable Development Strategy | Our Energy Future – creating a Low Carbon Economy |

In the field of bio-energy, different documents, such as, biomass strategies or action plans, renewable energy strategies or energy policies were analysed.

The country reports include short descriptions of the policy areas that were analysed and a short assessment of the relevance of the policy documents within the policy areas, filled in questionnaire templates as well as a short overview assessment from national view. The main analysis was done on the basis of a common questionnaire which included templates with standardised and non-standardised questions. Accordingly, they were analysed with quantitative or qualitative methods.

## 4. Currently important innovation areas in the countries

In a first step of the survey, country author groups were asked to define "innovation frontiers" for forestry in their countries, understood as currently important innovation areas. The national lists of innovation frontiers included a maximum of 6 to 8 innovations that attracted most attention in the countries in the last one or two years. The report therefore reflects the situation of the years 2006/2007. The survey asked for the types of innovations as defined in Figure 1 (product, process, marketing, organisational and institutional innovations), related to two broad innovation fields of forestry and the forest sector: territory-based services, and wood related value added chains. The detailed results are given in Annex 3, the overview is presented in Table 2.

The table shows innovation areas that are – according to the expert assessment – currently important, i.e. they should mostly be in earlier stages of adoption, including early adoption and broad adoption. If innovations that are shown in other countries are not given for a certain country, this may mean that this innovation is not seen relevant in the country, has not been started yet, or is in a later stage of adoption and therefore not included in the list. It is important to mention that the categories were deducted from the information given from the countries – they were not defined prior to the survey. Table 2 gives the condensed overview of the innovation frontiers in the countries that were included in the survey (all countries except Cyprus provided an assessment of the current innovation fields).

In sum, across wood and non-wood production areas there seems to be an innovation focus on product innovations and new forms of marketing. The most important **new products** are in the fields of recreational and educational services (named to be currently important in eleven countries) and bio-energy products (15 countries). Educational services particularly include activities addressed to the broad public (in German language named Waldpädagogik) and are often related to recreational activities, such as in guided tours, museums or forest and environmental educational or information centres in the forest, etc. Bio-energy is currently a hot topic almost all countries. **New forms of marketing** are being developed for non-wood forest products and services as much as for timber sales. Timber certification processes have some significance in many countries.

New product fields within **territory based services** are from different ecosystem services of forests, particularly environmental services and recreational and educational services. Recreational and educational services seem to be most important innovations. This result goes along with the results from forest owners surveys conducted in Central European countries by Rametsteiner et al. (2005) from 2000 which show that within service innovations recreational services are the most important. The significance of regional cross-sectoral coordination seems to be mirroring the challenge of how to organise the provision of territory-based services which often has to involve many providers (land-owners) and users (e.g. tourism) (compare Weiss et al. 2007).

**Table 2**. National innovation frontiers in the forest sector (years 2006/2007)

| | Type | | Category of innovation | ∑ | AT | BG | CH | CZ | DE | EE | FI | FR | HR | IT | LT | NO | PL | PT | RO | SE | SK | UK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Territory based services | PD | 28 | *Non-timber forest products* | 2 | - | X | - | - | - | - | - | - | X | - | - | - | - | - | - | - | - | - |
| | | | *Environmental services* | 5 | - | X | X | - | X | - | - | - | - | - | X | - | - | - | - | - | - | X |
| | | | *Recreational services* | 9 | X | - | - | X | X | - | X | X | X | X | - | - | - | - | - | - | X | X |
| | | | *Forest education* | 8 | X | - | X | - | X | - | - | - | X | X | X | - | - | - | - | - | X | X |
| | | | *Health and social services* | 2 | - | - | - | - | - | - | X | - | - | - | - | - | - | - | - | - | - | X |
| | | | *Spiritual and cultural services* | 2 | - | - | - | - | X | - | - | - | - | - | - | - | - | - | - | - | - | X |
| | PC | 5 | *Various process innovations* | 5 | - | - | X | - | - | - | X | - | - | X | - | - | X | X | - | - | - | - |
| | M | 17 | *Marketing of NWFPS* | 7 | X | X | - | X | - | - | X | - | - | X | - | - | - | - | - | - | X | X |
| | | | *Internet marketing* | 5 | X | - | - | - | - | - | X | - | - | - | - | - | X | - | - | X | - | X |
| | | | *Territorial marketing* | 2 | - | - | - | - | - | - | - | X | - | X | - | - | - | - | - | - | - | - |
| | | | *Other marketing innovations* | 3 | - | - | - | - | - | - | - | - | - | - | X | - | - | - | - | X | - | X |
| | O | 4 | *Various organisational novelties* | 4 | X | - | - | - | - | X | X | - | - | - | - | - | - | - | - | X | - | - |
| | I | 15 | *Regional cross-sectoral coord.* | 8 | - | - | - | X | X | - | - | X | X | X | - | - | - | - | - | X | X | X |
| | | | *Integrated spatial planning* | 3 | - | - | X | - | - | - | - | X | - | - | - | - | - | - | X | - | - | - |
| | | | *New national policies* | 4 | - | - | X | - | - | - | X | - | X | - | - | - | - | - | X | - | - | - |
| Wood-related value chains | PD | 28 | *Bio-energy* | 15 | X | X | X | X | - | - | - | X | X | X | X | X | X | X | X | X | X | X |
| | | | *Construction* | 5 | - | - | X | X | - | X | - | - | - | - | - | - | - | - | - | - | X | X |
| | | | *Wood modifications* | 7 | X | - | X | - | X | - | X | X | - | - | - | X | - | - | - | - | - | X |
| | | | *Chemical products* | 1 | X | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | PC | 27 | *Afforestation* | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | X | - | - | - | - |
| | | | *Harvesting* | 6 | - | - | X | X | - | - | - | X | - | X | X | - | - | - | - | - | X | - |
| | | | *Wood processing* | 3 | - | - | - | - | - | - | - | - | - | - | X | - | - | - | - | X | - | X |
| | | | *Use of ITC* | 6 | - | - | X | - | X | X | X | X | - | - | X | - | - | - | - | - | - | - |
| | | | *Logistics* | 6 | X | - | - | - | X | - | X | X | - | - | - | X | - | - | - | X | - | - |
| | | | *Prefabrication* | 4 | X | - | X | - | - | - | - | - | - | - | - | - | - | - | - | X | - | X |
| | | | *Environmental production* | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | X |
| | M | 18 | *Product promotion* | 2 | - | - | - | - | X | - | - | - | - | - | - | - | - | - | - | - | - | X |
| | | | *Certification* | 6 | X | - | X | - | - | - | - | X | X | X | - | - | - | - | - | - | - | X |
| | | | *Sales methods* | 10 | X | X | X | X | - | - | X | X | - | X | - | - | X | - | X | X | - | - |
| | O | 22 | *Horizontal cooperation* | 8 | X | - | X | X | X | - | - | - | X | X | X | - | - | - | - | - | X | - |
| | | | *Vertical cooperation* | 6 | X | - | - | X | - | - | - | - | X | X | - | - | - | - | - | - | X | X |
| | | | *Cluster* | 4 | - | - | - | - | X | - | X | X | X | | - | - | - | - | - | - | - | - |
| | | | *Other organisational novelties* | 4 | - | - | X | - | - | - | - | - | - | X | - | - | - | - | - | X | X | - |
| | I | 8 | *Sector integration* | 3 | - | - | - | - | - | - | X | X | - | X | - | - | - | - | - | - | - | - |
| | | | *Cross-sectoral coordination* | 3 | - | - | - | - | X | - | - | - | - | X | - | - | - | - | - | X | - | - |
| | | | *New national policies* | 2 | - | - | - | - | - | - | - | X | X | - | - | - | - | - | - | - | - | - |

*Legend*: Innovation types: PD – Product innovation, PC – Process innovation, M – Marketing innovation, O – Organisational innovation, I – Institutional innovation; the figure gives the number of countries for which this type of innovation was named; under∑ the number of countries is given for which these innovation categories are relev ant.

New **wood products** are related to bio-energy production, wood construction and wood modifications. Different forms of **bio-energy** production – including solid wood, biofuel and biogas – is the innovation field that yielded highest attention in the forest sector in the European countries in the recent years.

There are some differences between the two innovation fields: Within **territorial services**, institutional innovations seem of particular importance: regional cross-sectoral coordination processes are often mentioned. Within the **wood value chain**, also process innovations as well as organisational novelties are important in the countries: the process innovations comprise new harvesting technologies, use of ITC, logistical rationalisation as well as prefabrication and modular systems in the timber industry. New organisational solutions are found in the form of horizontal and vertical co-operations and cluster initiatives.

It seems that for territory-based services the **coordination of actors** is more complex and can often not be accomplished in organisational models among firms but needs activities on institutional level. In the field of wood production, horizontal and vertical cooperation is also important but can be solved among firms in new organisational models.

## 5. Innovation-related goals and issues

The country experts searched the analysed policy documents for goals and issues that are related to innovation and included them in the country reports in form of text passages. These were then analysed across all countries/documents by using qualitative interpretation methods. In the analysis, it was asked how many innovation related goals and objectives as well as issues and problems were given in the documents and what the issues were.

### *5.1. Innovation-related goals and objectives in policy documents*

In the questionnaire the national experts were asked to specify (describe qualitatively by using text passages from the original documents) what **goals and objectives** are formulated in relation to innovation in the policy documents. The analysis below shows how many innovation-related goals and objectives were found (no, some, many). Most innovation related goals are found in innovation, forest sector, and regional development policy documents: in between around 50 and 90% of the countries, “many” innovation related goals are found in these documents. In the field of forest policy, there is a diversity of countries and the categories “many”, “some” and “no” innovation related goals are more evenly distributed among the countries than in other policy fields. Sustainable development and renewable energy policies are those that mention innovation-related goals least often.

When looking at the goals and objectives of the policy documents it seems that besides of innovation policies, the forest-based sector programmes and regional development programmes have the strongest awareness for innovation. Forestry and rural development programmes are also in the middle field (see Figure 2).

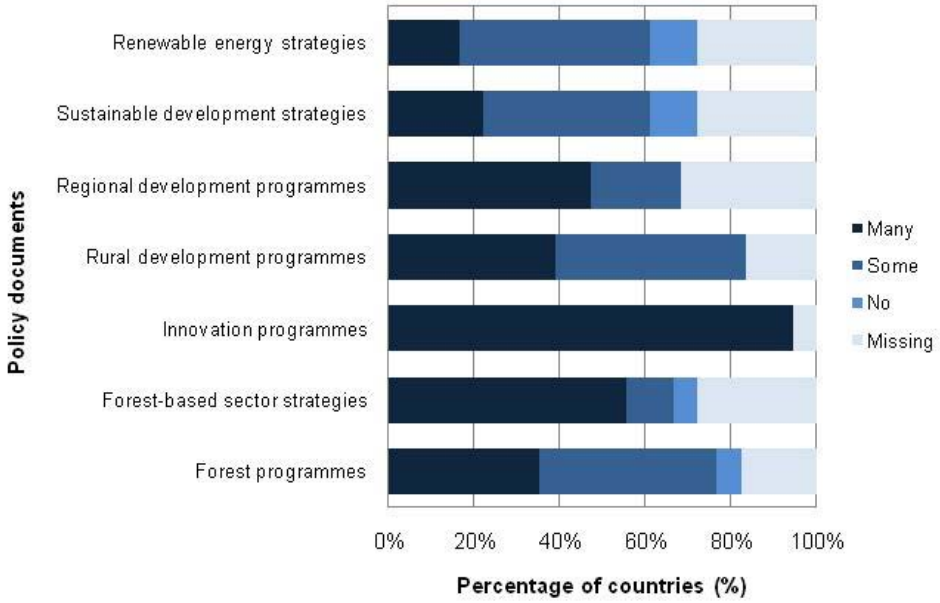


**Figure 2**. Innovation related goals and objectives in policy documents (n=19)

### *5.2. Issues and problems in policy documents*

The national experts were asked to state in the questionnaire what main **issues and problems** are formulated in the policy documents in relation to innovation. The analysis asked in a first step how many innovation-related issues and problems were stated in the documents (no, some, many). When looking how many innovation-related issues and problems were given we find the most in innovation policies, rural development programmes and forest-based sector strategies, followed by regional development programmes and forest policies. The least are found in renewable energy plans and sustainable development programmes.

When comparing the issues and problems across policy fields, the picture is similar to the goals and issues: the highest awareness is in innovation policy documents. The forestry, forest-based sector and rural and regional development documents are all in the middle field, only, they rank differently among themselves (see Figure 3).

In the questionnaires, again text passages from the original documents where included by the experts. On the basis of these texts a content analysis was conducted. The information was condensed and classified into the following categories and categories: The used classes refer to frame conditions, ecological, economic and social goals, and functions of the institutional system in supporting innovation and economic development and types of innovations (see Table 3). These categories were developed in the interpretative analysis of the texts. Within the frame conditions, the classes were formed according to the texts. The development goals were divided according to the three pillars of sustainable development that are often used in the literature. The functions of the institutional system with regard to innovation support were divided according to a classification used by Edquist and Johnson (1997) which distinguishes the reduction of uncertainty, the management of coordination and cooperation, and providing incentives, but the category of reducing uncertainties was further divided into R&D, human resources development, and providing information. For the innovation types, the classification from chapter 2 was used.

Table 3 gives an overview on the issues and problems as found in the policy documents. The results of the analysis are given for the four categories below, while Table 4 summarises the findings.

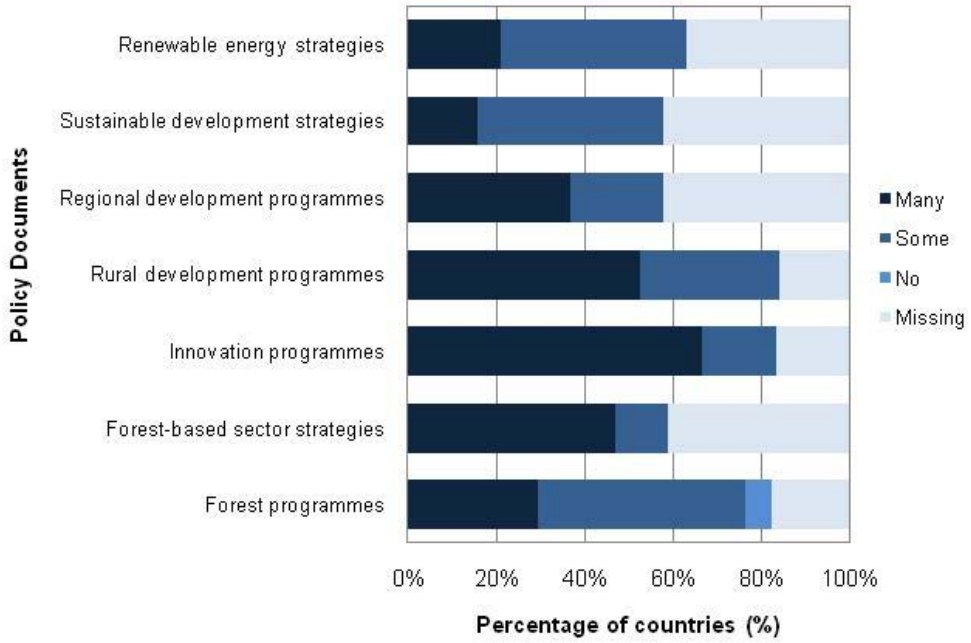


**Figure 3**. Innovation related issues and problems in policy documents (n=19)

*Frame conditions*

They are important issues in **forest policy, innovation policy and regional development policy**. Arguments relate to global economic change and deregulation of markets. Limited capacities for R&D are typically argued in countries with economies in transition. Further arguments refer to the need for an innovation-oriented, entrepreneurial culture, the simplification of bureaucratic procedures or the state of the technical infrastructure, including ICT. Mostly, the frame conditions pose challenges to the national economies and enterprises, such as the globalising economy or a transition economy, decreasing profitability of forestry and agriculture and growing societal needs with regard to land resources (such as nature conservation, recreation, etc.) which are often not yet transposed to marketable products and services. In sum, the most often named framework factor is the **global economic change and the related pressure on the national economies**.

*Development goals*

Policies refer to three different overall goals: ecological, economic and social goals. Most often economic goals are mentioned but also ecological goals are frequently named. Social goals are mentioned much less. Not all of these three goals are found argued in all policy fields. The sectoral policies (forest and forest-based industry policies) typically argue with ecological as well as economic goals, whereby economic goals prevail. **Ecological goals** are the need for environmentally friendly technologies or the challenge of balancing biodiversity conservation and the use of bio-energy for climate change mitigation. For **economic goals** they mention the challenged profitability of forestry and the forest-based industry in an increasingly competitive global economy. Innovation policies hardly mention these goals in this form. They rather refer to framework conditions and functions of the institutional system. Rural and regional development policies are similar but sometimes also mention social goals. Rural

development policies are the ones that – in relation to other policies – more likely mention **social goals** as a background for the policy. These are mainly to alleviate regional disparities and to keep rural areas populated and "vital". Sustainable development and renewable energy policies refer to goals from all three categories, but ecological goals prevail.

*Functions of the institutional system*

Many arguments that are brought forward in the policy documents refer to different functions of the institutional system for innovation and economic development. Most of them refer to the **knowledge base** of the economy, but also **coordination problems** and **investment questions** are mentioned.

**Table 3**. Categories of issues and problems deducted from the policy documents (n=19)

| Categories and classes | Key words classified under these classes |
|---|---|
| ***Frame conditions*** | |
| Global economic change | Global economic change, deregulation of markets, structural change, competitive environment |
| Institutional capacity | Capacities for R&D, technological level |
| Public perception | Public and consumer attitudes |
| Entrepreneurial culture | Innovation oriented culture, entrepreneurship |
| Bureaucracy | Legal and tax system, public administration, bureaucracy |
| Technical infrastructure | Technical infrastructure, information and communication technologies |
| Ownership | Ownership, demands by society |
| ***Development goals*** | |
| Ecological goals | Environmentally friendly technologies, biodiversity conservation, ecological dimensions, climate change prevention and mitigation, renewables |
| Economic goals | Competitiveness, jobs, employment, income, rural development, endogenous development, competitive regions, development of mountain regions, profitability, economic potential |
| Social goals | Social problems, vitality of regions and rural areas, regional disparities, demographic changes, keeping population structure in all parts of the country |
| ***Functions of the institutional system*** | |
| Research and Development | R&D, research capacities, research financing |
| Human resources development | HRD, education, training |
| Providing information | Providing information, market information, technology transfer |
| Coordination and co-operation | Coordination problems between authorities, coordination of stakeholders, unclear responsibilities, strengthening business co-operation |
| Investments | Investments for innovations, governmental support for innovations |
| ***Innovation types*** | |
| Products and services | New products and services, new markets, diversification, NTFPS, biomass, value added |
| Process innovation | New technologies, efficiency, rationalisation, company re-organisation, modernisation, management methods, productivity |
| Marketing | Marketing of products, saleability |
| Organisation | New methods of organisation, re-organisation, company co-operation |
| Institutional innovation | Policy and institutional innovations, political change |

Particularly the innovation policies strongly and practically in all countries talk about the need for **R&D** with related problems (limited research capacities and need for financing) and the need for **human resources development** (such as education and training). The need for providing **information** (market information, technology transfer) is mentioned in policies from different fields.

*Innovation types*

The type of innovation that is mentioned most frequently as an important background for the policies are new technologies and other measures to increase **efficient production** (rationalisation, modernisation, etc.). Other innovation categories that are named are: the diversification into new products and services (including NTFPS) in order to tap new markets and to increase value-added production, the marketing of products, new methods of organisation and management as well as institutional change (social, political or institutional innovations). **New products and services** are rather mentioned in forest, forest-based industry and rural development policies. **Technological innovations** are mentioned in almost all policy fields, but interestingly most often in rural development policies and least in regional development policies. Rural development policies are those which mention innovations most often, including product, process, **marketing** and **organisational novelties**. SD and renewable energy policies are those which mention **institutional changes**.

*Comparison of policy fields*

The comparison of policy fields shows that forest and forest-sector policy documents are similar in the stated goals and innovation types: they mainly name ecological goals such as environmental technologies and economic goals such as the profitability of the sector and similar innovation types (new technologies, goods and services). Both give new technologies, goods and services as priority areas. In contrast, sustainable development programmes and renewable energy plans primarily state ecological goals and particularly mention necessary institutional changes such as inter-sectoral cooperation. Regional and rural development programmes primarily talk about social goals such as keeping population in rural areas. Innovation policy programmes have a strong focus on innovation support measures, being a core function of the innovation system.

# 6. Integration of innovation in policy fields

In order to find out in how far the concept of innovation is integrated in policy areas, the survey questionnaire included a number of questions about the innovation orientation of the documents. The documents were analysed how frequently the term innovation or related terms are mentioned in the documents and how frequently the documents refer to the innovation frontiers as defined prior to the survey. The national experts assessed further which relevance is given to the topic of innovation, how general or specific innovation is addressed in the documents and which understanding of innovation policy underlies the documents.

## *6.1. Frequency of "innovation" and related terms in policy documents*

The questionnaire asked under "overall innovation orientation" how frequent innovation-related terms appear in the analysed documents. The **frequency** was assessed as "never", "sometimes" or "frequently". This question was subdivided into the following three:

- Frequency of occurrence of the more generic terms 'innovation' or synonyms ('new products', 'new services', 'new processes', new marketing methods', 'new business models');
- Frequency of occurrence of terms that are related to innovation, for example entrepreneurship, diversification, or competitiveness;
- Frequency of occurrence of the forest sector 'innovation frontier' referring to the currently most important innovation areas in the countries as identified by the experts prior to the document analysis (see chapter 4).

**Table 4**. Priority areas in the analysed policy fields

| | **Forest programmes** | **Forest-based sector strategies** | **Innovation programmes** | **Rural development programmes** | **Regional development programmes** | **Sustainable development strategies** | **Renewable energy strategies** |
|---|---|---|---|---|---|---|---|
| **Framework conditions** | Stated as important | - | Stated as important | - | Stated as important | - | - |
| **Development goals** | Economic goals; Ecological goals | Economic goals; Ecological goals | - | Social goals | Social goals | Ecological goals | Ecological goals |
| **Functions of the innovation system** | - | - | Research and Development; Human Resources Development | - | - | - | - |
| **Types of innovation** | Technologies; Goods and services | Technologies; Goods and services | - | Technologies; Goods and services; Marketing; Organisation | - | Institutional changes | Institutional changes |

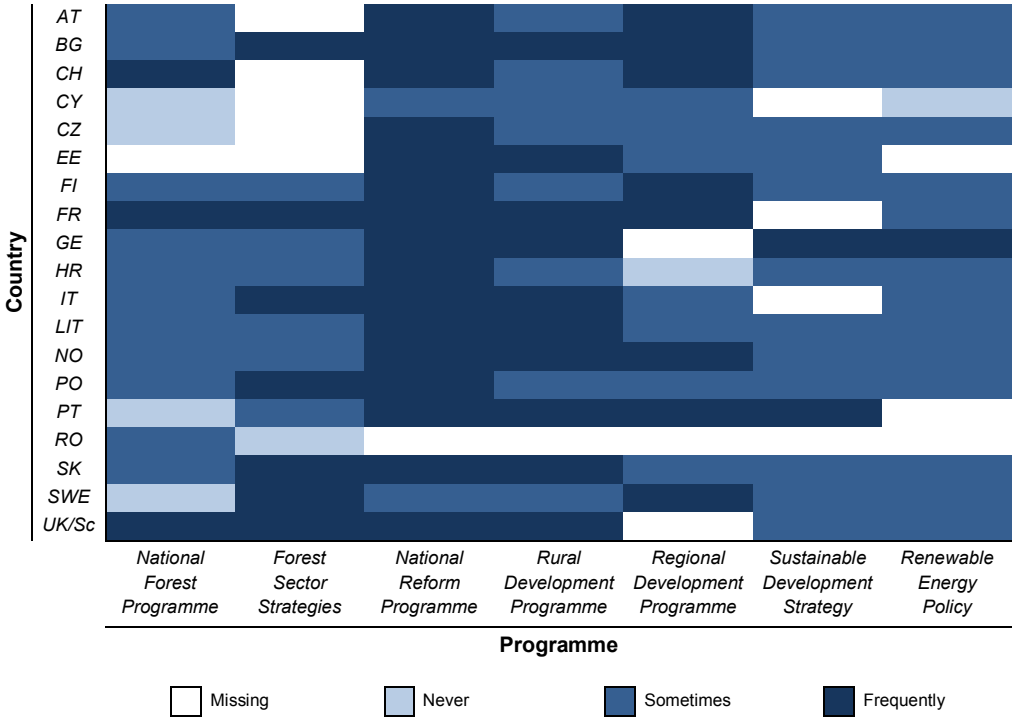


**Figure 4**. Frequency of the term "innovation" in national policy documents (n=19)

*Frequency of the term innovation*

The term "innovation" or synonyms are found in the policy documents in the following order in terms of frequency of appearance:

1. Innovation programmes
2. Rural development programmes
3. Regional development programmes
4. Forest-based sector strategies
5. Forest programmes
6. Sustainable development strategies
7. Renewable energy strategies

In practically all countries, the term "innovation" appears frequently in the **national reform programmes**. For the **rural development programmes**, **regional development programmes** and **forest-based sector strategies** the frequency was assessed between "sometimes" and "frequently". In forest policy documents, sustainable development strategies and renewable energy plans the term "innovation" appears in average only sometimes.

The term innovation rather frequently appears in policy documents of DE, FR, and UK/Sc, followed by the countries BG, CH, EE, IT and PT. The following Figure 4 show the frequency of the term "innovation" in policy documents from the different policy areas as compared across countries.

This picture is similar to the ones when we analysed the innovation-related goals and issues of the documents: After the leading innovation policy documents, rural and regional development programmes and forest-based sector programmes and forest policy documents were in the middle field. With regard to forest policy, it seems that innovation is slightly more often in the goals than mentioned afterwards. No geographical grouping of countries is visible.

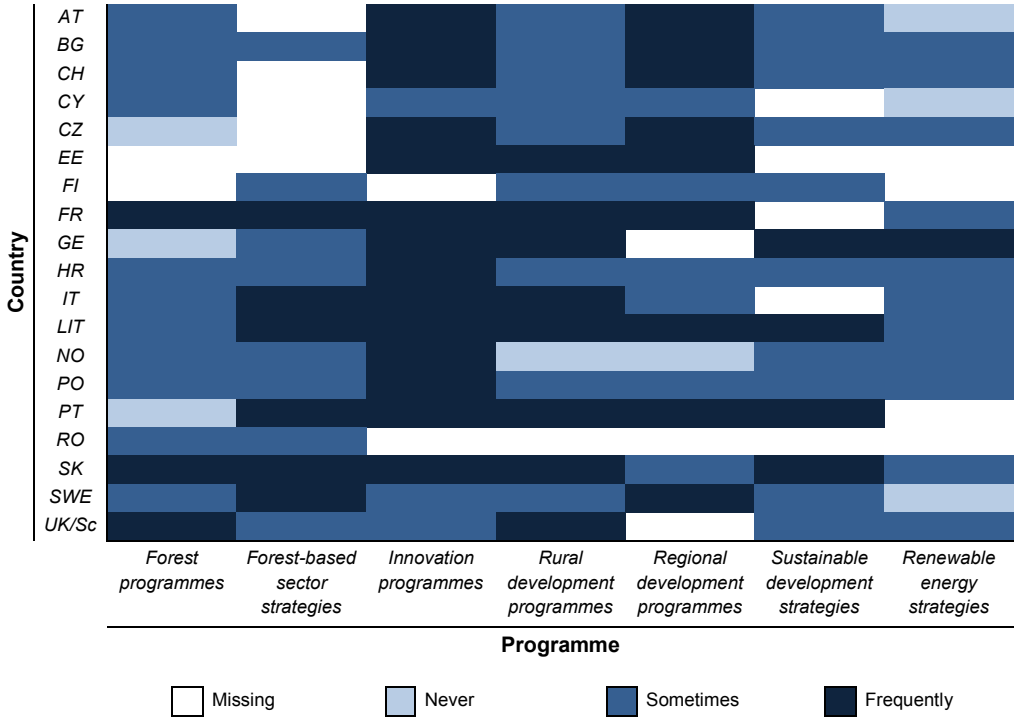


**Figure 5**. Frequency of innovation related terms in national policy documents (n=19)

*Frequency of innovation-related terms*

Terms that are related to "innovation" such as: competitiveness, diversification, or entrepreneurship, appear in the policy documents in the following order:

1. Innovation programmes
2. Regional development programmes
3. Forest-based sector strategies
4. Sustainable development strategies
5. Rural development programmes
6. Forest programmes
7. Renewable energy strategies

In most documents these terms that are strongly related to innovation and economic growth appear "sometimes" or "frequently". Most often they are naturally named in innovation policy documents but they seem of relevance for many policy fields. Economic growth issues seem to be of least importance for forest policy documents and renewable energy plans.

The innovation-related terms appear most often in EE, FR, LT, PT and SK. The following Figure 5 show how frequently the mentioned innovation-related terms appear in the analysed policy documents from the different policy areas as compared across countries.

The similar results for the term innovation and the growth-related terms indicates that in the policy documents **innovation is actually related to economic growth issues** such as entrepreneurship and competitiveness.

The results to this question are very similar to the frequency of the term "innovation" itself as well as to innovation-related goals and issues. In comparison, however, rural development programmes more often refer to the term innovation itself than to economic growth. For regional development programmes, in contrast, economic growth is a much more important target. Sustainable development strategies do refer to economic growth issues as this is one of the three pillars of sustainable development, the problem of innovation, however, is then not so strongly taken up. Forest policy documents do refer to innovation but this seems not to be so strongly connected with economic growth issues. This is interesting as the issue of the unsure profitability of the sector is prominently addressed as a policy issue.

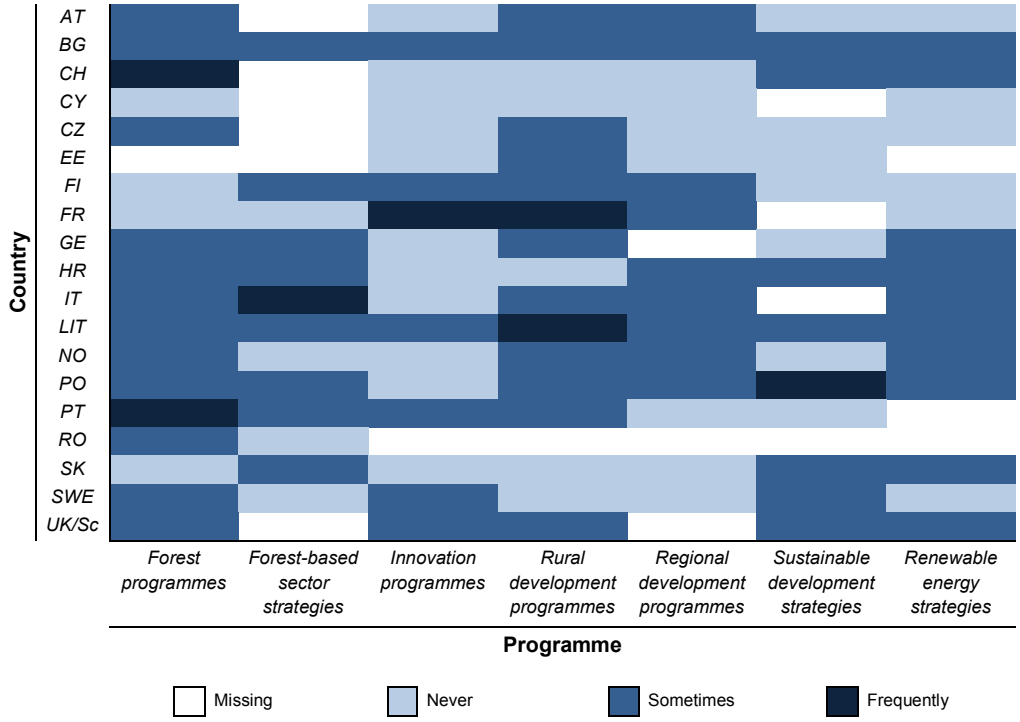


**Figure 6**. Frequency of forest-relevant innovation frontiers in national policy documents (n=19)

*Frequency of innovation frontiers of forestry*

At the beginning of the country reports for each country the actual forest sector 'innovation frontiers' were defined by the national expert team which means the most important current innovation areas in the countries (the results were given in chapter 4).

These innovation frontiers appear in the analysed policy documents in the following order:

1. Forest programmes
2. Rural development programmes
3. Forest-based sector strategies
4. Renewable energy strategies
5. Sustainable development strategies
6. Regional development programmes
7. Innovation programmes

In contrast to the general innovation terms, the concrete frontiers most often appear in **forestry related documents**. Mostly, they do not appear very often (never or sometimes) which indicates that the policy documents are **not strongly oriented at actual innovation issues**.

The innovation frontiers appear most often in CH, DE, FR, HR, IT and LT. The following Figure 6 show how frequently the forest sector innovation frontiers are mentioned in the analysed policy documents from the different policy areas as compared across countries.

The forest-related innovation frontiers appear more often in documents of policy fields that are closely related to forestry: besides of forest policy, for instance, in forest-sector strategies. Also rural development programmes and renewable energy plans rank high because the production of biomass is of a major importance not only within the field of forestry.

Comparing the results of this analysis with the questions regarding the general importance of innovation in the policy documents it can be concluded that the **forestry sector is mostly not closely connected with innovation and regional development policies**: on the one hand, innovation is not such a prominent issue in forest policy documents, on the other hand, those innovation fields that are important for forestry, are not strongly reflected in innovation and regional development programmes.

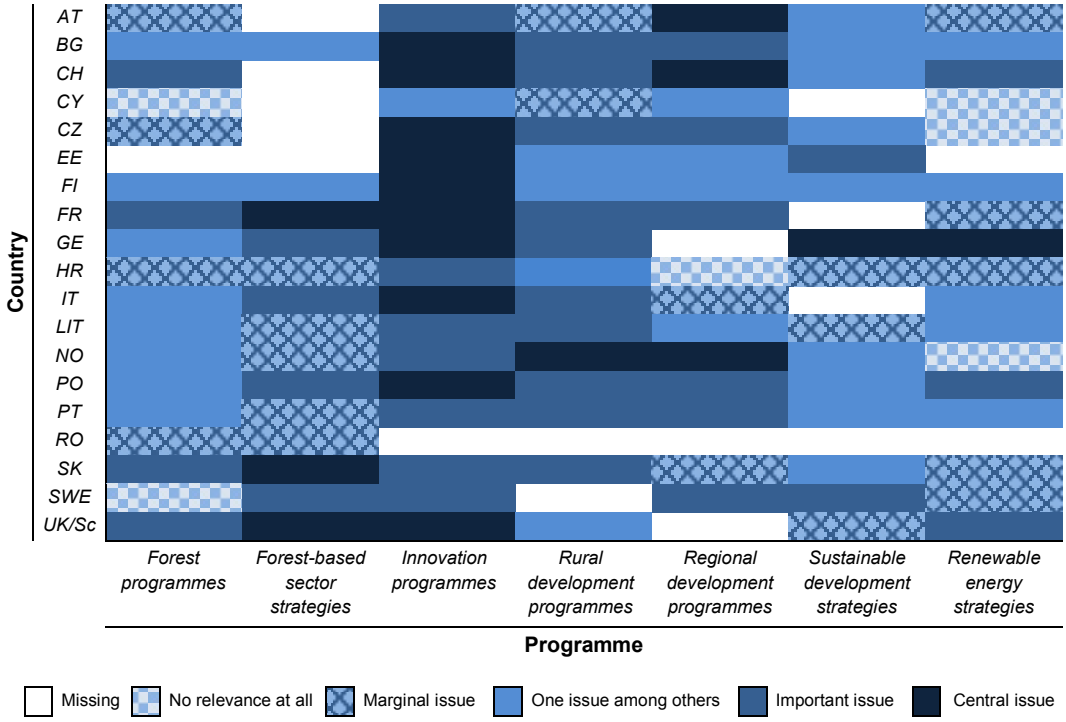


**Figure 7**. Relevance of innovation in national policy documents (n=19)

### *6.2. Relevance of innovation in policy documents*

The questionnaire asked how much **relevance** the analysed documents give to innovation (No relevance at all, Marginal issue, One issue among others, Important issue, Central issue). According to the assessment by the national experts the policy fields are ranked in the following order of relevance of innovation:

1. Innovation programmes
2. Rural development programmes
3. Regional development programmes
4. Forest-based sector strategies
5. Sustainable development strategies
6. Forest programmes
7. Renewable energy strategies

Innovation seems to be **most relevant in the Reform Programmes** (between "important" and "central issue"), for the rural development programmes, regional development programmes, forest-based industries strategies and sustainable development strategies the relevance was assessed between "one issue among others" and "important", and in forest policy documents and renewable energy plans innovation is almost only a "marginal issue".

The relevance is assessed to be rather high in BG, CH, DE, EE, FR, IT, PO and UK/Sc. The following Figure 7 show the relevance of innovation in the analysed policy documents from the different policy areas as compared across countries.

The results for the relevance of innovation and for the frequency of the use of the term in the documents are practically the same: Besides of innovation policy documents, the highest relevance for innovation is given in rural and regional development programmes as well as forest-based sector strategies, this being the same ranking as for the frequency of the term innovation. Both questions seem to be equal measures for the overall importance of innovation in a policy document.

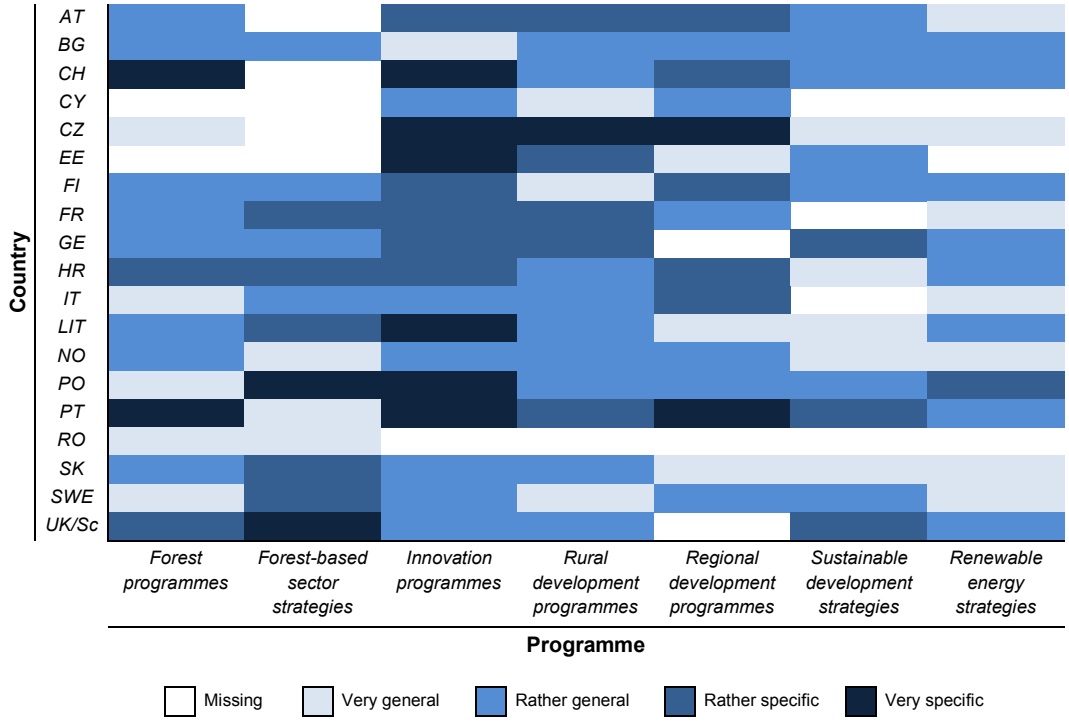


**Figure 8**. Degree of specification of innovation issues in national policy documents (n=19)

### *6.3. Degree of specification of innovation issues in policy documents*

The questionnaire asked how general or specific innovation issues are addressed by the documents (very general, rather general, rather specific, very specific). According to the assessment by the national experts the degree of specification appears in the different policy fields in the following order:

1. Innovation programmes
2. Forest-based sector strategies
3. Regional development programmes
4. Rural development programmes
5. Forest programmes
6. Sustainable development strategies
7. Renewable energy strategies

The innovation policy documents mention innovation mostly between rather general and very specific, the forest-based industry and rural and regional development policies between rather general and rather specific, the forest policies rather general, and the sustainable development strategies and renewable energy plans between rather and very general.

The documents most specifically address innovation in CH, CZ, DE, EE, PL, PT, and UK/Sco. The following Figure 8 show how specific innovation is addressed in the analysed policy documents from the different policy areas as compared across countries.

Roughly, the picture is similar to both the frequency and relevance of innovations: **documents that give high relevance to innovation and/or mention innovation and related terms very frequently, tend to address the issue of innovation also rather specifically**. The three seem to be equal measures for the orientation of policy documents towards innovation issues.

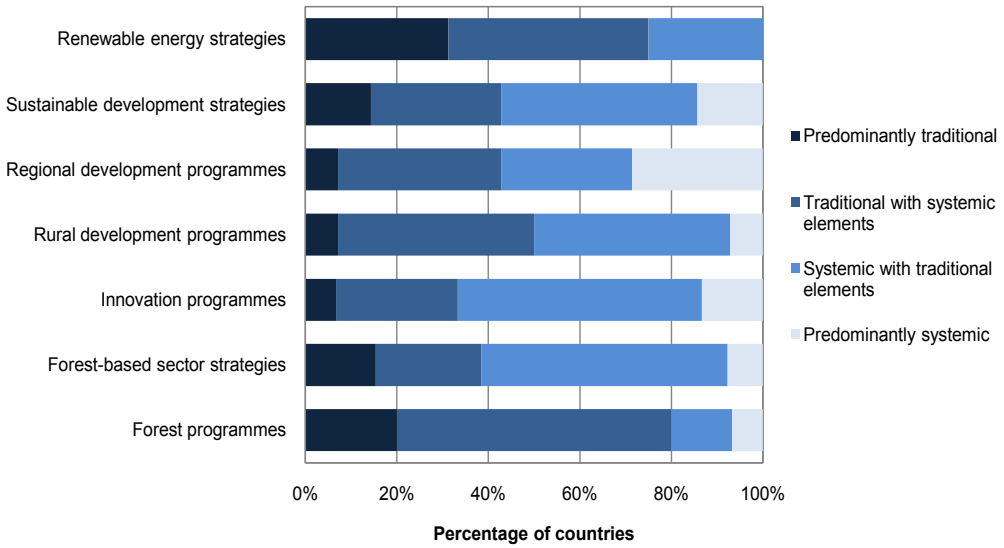


**Figure 9**. Understanding of innovation policy in national policy documents (n=19)

### *6.4. Understanding of innovation policy in policy documents*

Under the question "Understanding of innovation policy" the national experts assessed in how far the policy documents reflect a **traditional or systemic understanding** of innovation policy. The questionnaire used the fourfold typology as defined at the beginning of this chapter with the following four categories: (1) predominantly traditional science and technology policy; (2) traditional science and technology policy with systemic elements, (3) systemic innovation policy with science and technology policy elements, or (4) predominantly systemic innovation policy.

*Understanding of innovation policy in different policy fields*

According to the assessment by the national experts the understanding of innovation policy in the different policy fields as "systemic" appears to be in the following order:

1. Regional development programmes
2. Innovation programmes
3. Sustainable development strategies
4. Rural development programmes
5. Forest-based sector strategies
6. Forest programmes
7. Renewable energy strategies

It is interesting that, **besides of the innovation policy documents, particularly the regional development programmes and the sustainable development strategies follow a systemic understanding** of innovation policy. Regional development programmes are the ones that most often propose systemic intervention for economic development. **Forest-based sector strategies appear to be more on the side of a systemic understanding, forest policy and rural development policy documents are found more on the side of traditional innovation policy approaches** (see Figure 9). Renewable energy policy documents most frequently follow a traditional approach to support the technology.

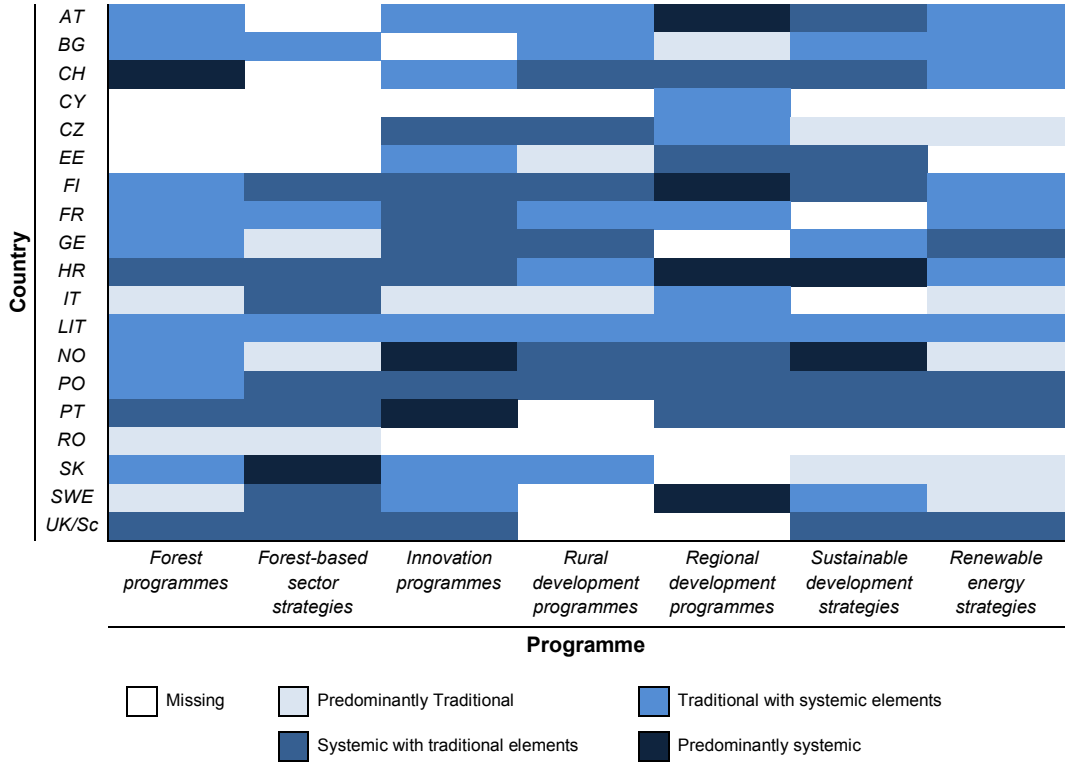


**Figure 10**. Understanding of innovation policy in national policy documents (n=19)

*Understanding of innovation policy in the countries*

A systemic approach to innovation policy seems to be strong in Estonia, Croatia and UK/Scotland, a traditional approach seems to be dominating in Italy and Bulgaria. The specific data on the understanding of innovation policy in the documents are shown in the following Figure 10.

*A systemic understanding not contingent on strong integration of innovation in policy documents*

As shown before, the frequency of appearance of the term innovation for the policy documents that were analysed, the assessed relevance of innovation in the documents and the degree of specification of innovation seem to be all good measures for the integration of innovation in the policy fields. The **degree of integration of innovation, however, does not go along with the understanding of innovation policy as traditional or systemic**, they appear to be rather different independent dimensions.

This is seen when looking at the policy fields: sustainable development strategies do not mention innovation frequently but often follow a systemic understanding of policies. Otherwise, policy documents that integrate innovation more strongly rather follow a more systemic understanding, and documents that do not rank innovation highly, rather have a traditional understanding. While a certain tendency can be seen here for a positive relation between the frequency of innovation and a more systemic understanding of innovation in the policies, this is not visible when looking at the countries.

When comparing the countries, there are four different types of countries with regard to innovation relevance and the understanding of policy intervention for innovation:

- In a group of countries the term innovation is used frequently (and is assessed highly relevant) and a systemic understanding of innovation policy is found (CH, EE, UK/Sc);

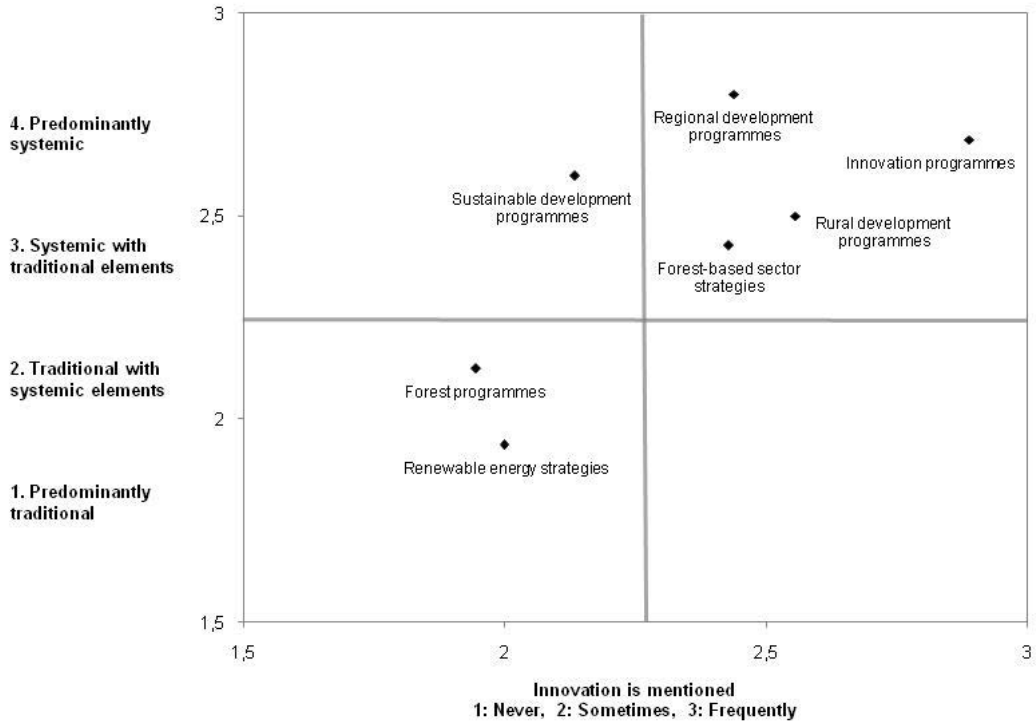


**Figure 11**. Relation between the frequency of the term "innovation" and the understanding of innovation policy – policy fields (n=19)

- In another group of countries the term is also used frequently but there is a more traditional approach to innovation policy (DE, BG, FR, IT);
- Further there is a group of countries with a rather systemic understanding of innovation policy but placing not such a high importance on the issue (AT, FI, HR, NO, PL); and
- Finally, the remaining group of countries has a rather traditional approach to innovation policy and does not place a high relevance to the issue (CY, CZ, LI, SE and SK).

In sum, a high relevance of innovation in the policy documents does not necessarily go along with a systemic understanding of innovation policy in different policy fields or countries (see Figure 12).

From our analysis, no explanation for the various groups or for the results for certain countries can be given. The reasons may lie in certain traditions or in the influence of EU policies and the certain time from when the documents date. They may depend on the specific selection of policy fields that were selected for this study and may look different for other policy fields. The reasons would have to be further studied by tracing the development process of the documents and by further qualitative methods of inquiry.

## 7. Innovation support measures

It is interesting to compare the goals as formulated in the policy documents with the measures. In the questionnaire, the measures foreseen by the documents for supporting innovation were classed into six categories from which some are more related to the traditional innovation policy approach (research and development, diffusion of innovation) and some to a systemic approach (human resources development, promoting interaction/managing interfaces, public demand creation for innovation, improving frame conditions). In the survey, the relative overall importance of innovation support within the document was assessed and the priorities for support measures.

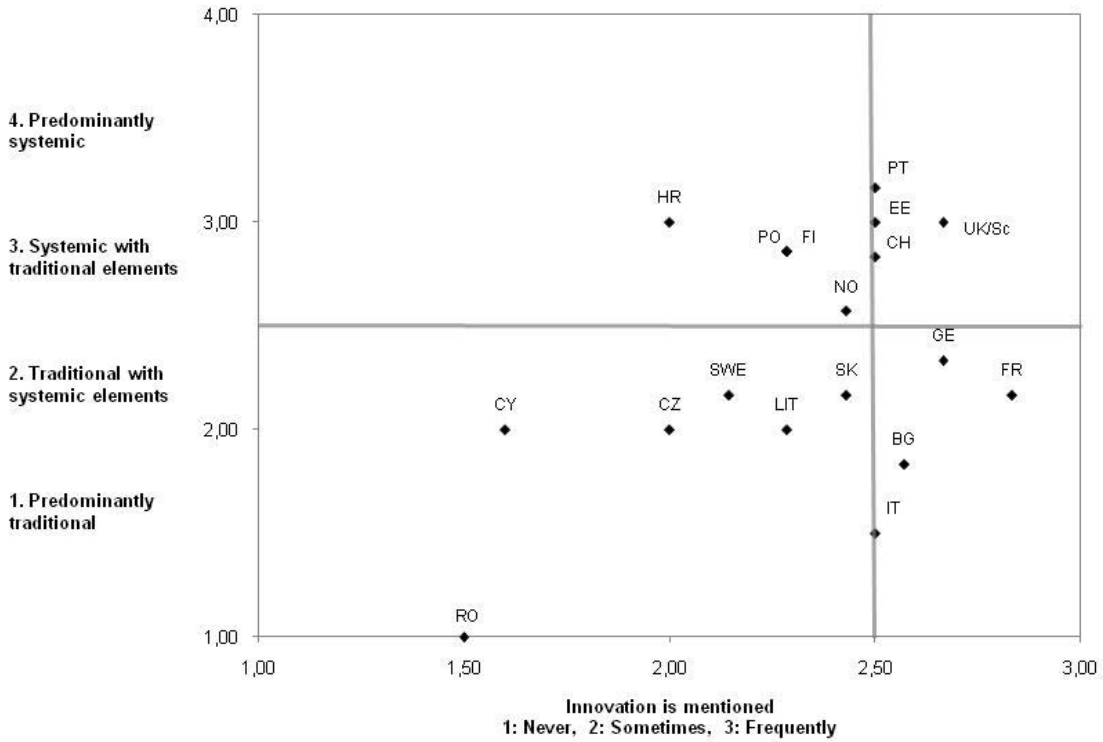


**Figure 12**. Relation between the frequency of the term "innovation" and the understanding of innovation policy – countries (n=19)

### *7.1. Relative importance of innovation support measures*

The questionnaire survey aimed to assess in how far the policy documents support innovation. This was done by means of two questions, one directed towards the overall relevance of innovation support measures compared with other support measures in the document, another asking how much innovation is furthered/promoted by the document as such. In the analysis these assessments were translated into high, medium, low, or no relevance of innovation support/promotion of innovation.

The results for both questions are very similar: only innovation policy documents focus strongly on innovation support in all countries. The following Figure 13 gives the detailed results for the first question.

The overall **relevance of innovation support measures** compared to other support measures proposed by the documents shows to be **high only in innovation policies** as they by definition focus on innovation support. Within in the documents from the other policy areas they are seen of very different importance in different countries.

The question on the relevance of innovation support measures was difficult to assess for the national experts and/or the answers were difficult to interpret by the researchers. These are the reasons for the relative high number of missing values. This observation is also true for the question regarding the promotion of innovation.

In sum, it can be said that all policy documents besides of innovation policy put very different emphasis on the support of innovation.

### *7.2. Priorities of innovation support measures*

The national experts were asked to give a qualitative assessment of which of the above mentioned categories are **priority areas for**

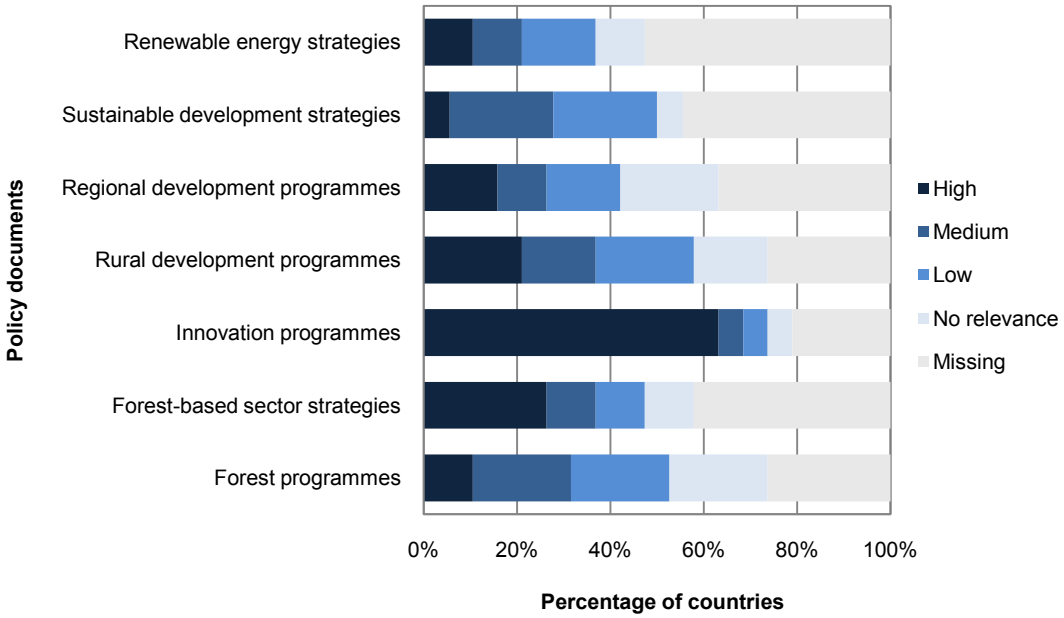


**Figure 13**. Relevance of innovation support measures in the policy documents

**innovation support** within the policy documents. Most favoured innovation support measures are as follows (see Figure 14):

Research and development: is the most often named priority within innovation support measures. It has the highest priority in total in innovation policies (named a priority in innovation policy documents in eight countries out of 12 valid answers). It has the highest priority compared with other types of measures also in the forest industry strategies, regional development strategies and sustainable development strategies. R&D is rarely given priority in rural development strategies.

Diffusion of innovation: is the second priority of the policy documents in total. It is often given a relative high priority in most documents except in sustainable development strategies.

Improving frame conditions for innovation: is the third priority. It is frequently given high priority in the documents.

Promoting interaction: is frequently given priority in forest policy documents as well as forest industry, regional development and sustainable development strategies.

Human resources development: is given priority in some documents from the forestry, forest industry, regional development and sustainable development policies.

Creating demand: has priority in rural development, innovation and forest-based sector policy documents in some countries.

Figure 14 shows for how many documents from the seven policy fields the measures from the six classes are priority measures (as assessed by the national experts).

The innovation support measures are given priority in the different policy areas as follows:

- Forest policy documents especially focus on the diffusion of innovations and strengthening the interaction between key actors.
- Forest-based sector policy documents tend to focus on those measures which are also the most favoured in general, particularly research and development support (R&D).
- Innovation policy documents have a strong emphasis on R&D but also on the diffusion of innovations.

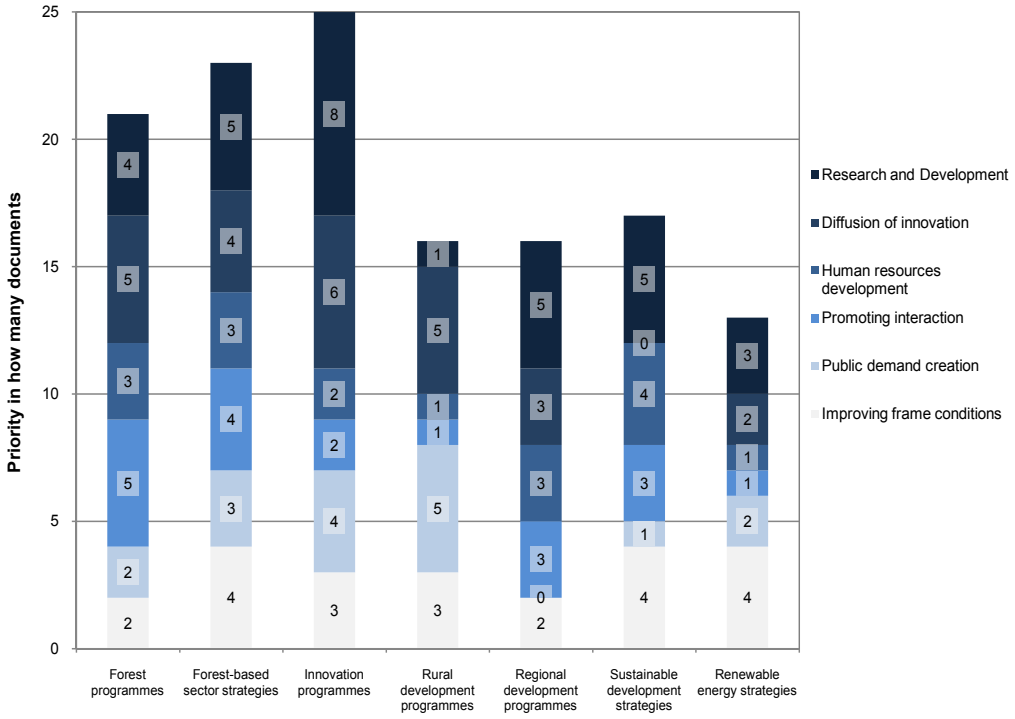


**Figure 14**. Priority of innovation support measures in different policy fields (n=19)

- In rural development programmes we often find innovation diffusion measures and demand creation.
- Regional development programmes often prioritize R&D but also other measures. It so follows its systematic policy understanding but not so pronounced as it could be expected from the rhetoric.
- Sustainable development strategies often name R&D, human resources development and improving frame conditions all as priorities.
- Renewable energy policies prioritize the improvement of frame conditions.

It is interesting to see that innovation and regional development policies employ traditional innovation support measures more strongly than others although the documents describe innovation policy in a pronounced systemic understanding. Although innovation policy documents and regional development programmes are those policy documents with the strongest emphasis of systemic innovation policy, the measures strongly follow the traditional intervention logic. There is a **contradiction of traditional measures to the systemic rhetoric** of innovation policy, a possible explanation for which may be that traditional measures do not change so fast as policy goals.

Sustainable development strategies are a good example for policies that follows a systemic understanding of innovation support in its rhetoric as well as in the types of measures.

## 8. Policy coordination

For the integration of innovation issues in sector policies, the coordination of the policy fields – their actors and documents – is necessary. Also for the development of innovations as such, a coordination across sectors and policies is needed.

The questionnaire asked about coordination processes between public and private actors in the formulation and implementation phases of the analysed policy documents. The analysis asks between which types of actors policy documents are coordinated, which forms or mechanisms of coordination are employed, and in how far their implementation is decentralised.

### *8.1. Coordination among public administration in the formulation of the policy documents*

The analysis of the administrative coordination asks in how far the policy documents were coordinated among different types of public bodies in the formulation phase. The questionnaire distinguished between public entities closer to the responsible actor (departments within one ministry), and such entities that are more distanced (ministries or other public organizations) by that referring to three types of coordination (multiple answers were possible):

- Intra-ministerial coordination: Refers to the co-ordination of different sections or departments within the same ministry, for example the coordination of the agriculture and the forestry department within the ministry.
- Inter-ministerial coordination: Refers to the coordination between different ministries, for example the ministry for environment and the ministry for economy.
- Coordination between ministry and other public organizations: Means the coordination with other organizations. These may include public agencies and councils such as research councils, etc.

The evaluation assumes that coordination with a greater number and with more distanced organizations is more difficult and less likely. It is assumed that a good coordination involves a greater number of actors as well as more distanced entities. The evaluation thus distinguished the following two aspects:

(a) Number of actors: documents were classified depending with **how many** sets of actors from the above categories they were coordinated (within ministry, across ministries, with other public bodies);

(b) Bridging distance: documents were compared with regard to the **distance that was bridged** in the coordination (bridging departmental or ministerial borders or to other public organisations).

*Coordination of forest policy documents*

Forest policy documents were analysed in more detail than documents from other policy fields. This analysis allows comparing NFP documents with other types of forest policy documents (e.g. forest act) as well as policy documents from Eastern European countries with economies in transition with Western European countries.

The analysed policy documents in the field of forest policy were coordinated to different extents (four out of all 16 documents were coordinated in all three of the categories given above, six were coordinated in two, six were coordinated only in one category). Documents are frequently coordinated between ministry departments and/or different ministries, only a part also with other public organisations (see Figure 15).

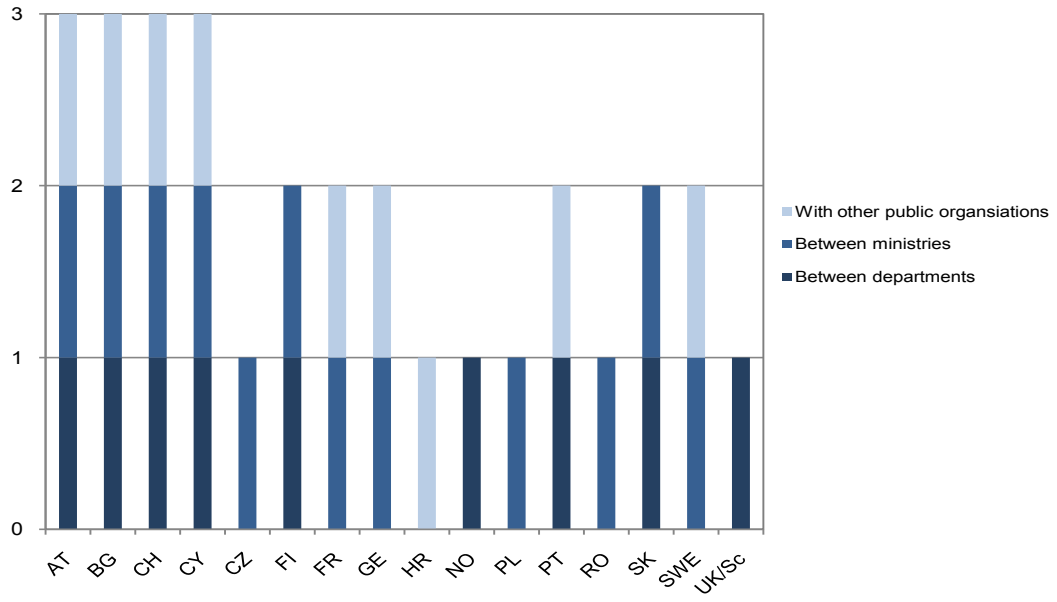


**Figure 15**. Coordination among public administration – Formulation of forest policy documents (n=19)

*Comparison of NFP and other forest policy documents*

(a) Number of actors: Twelve of the 16 analysed forest policy documents were NFPs. Four of them were coordinated in three categories, five in two categories, and three in only one category (Table 6 below). From the four other documents, only one was coordinated in two, but three in only one category. As a result from this evaluation it can be stated that NFPs tend to be better coordinated among different kinds of public entities when compared to forest policy documents that are not NFPs: More NFPs are coordinated with more different types of administration.

(b) Bridging distance: When looking at how far the coordination spans, there is a similar difference between NFPs and other forest policy document types (Table 7 below). Seven out of twelve NFPs were coordinated with other public organizations and five with other ministries. Two out of four non-NFPs were coordinated with other public organizations and two only with other departments of the same ministry. There is not a strict but still a difference suggesting that NFPs do cross the boundaries of the ministries to other ministries or other public organisations.

As a summary result from both analyses it can be concluded that **NFPs support a more systematic and broad inclusion of public bodies in the formulation process and thus support bridging to "more distance" public administrative entities**.

*Comparison of Western and Eastern European countries*

(a) Number of actors: In the analysis, the countries were classified into Western (10) and Eastern European countries (countries in transition) (6). Eight out of ten forest policy documents from Western European countries were coordinated in three or two categories, and two in only one category. In comparison, two forest policy documents from Eastern European countries were coordinated in three or two categories, and four in only one category (Table 6). It shows that traditional democracies tend to coordinate with more different types of administrations.

**Table 6**. Coordination of forest policy documents among public administration – number of actors

| **Coordinated in …** | | **… three categories** | **… two categories** | **… one category** |
|---|---|---|---|---|
| *Western European cou.* | *NFP* | AT CH CY (3) | DE FI FR PT (4) | |
| | *Non NFP* | | SE (1) | SCO NO (2) |
| *Eastern European cou.* | *NFP* | BG (1) | SK (1) | CZ PL RO (3) |
| | *Non NFP* | | | HR (1) |

**Table 7**. Coordination of forest policy documents among public administration – bridging distance

| **Coordinated with other …** | | **… public organizations** | **… ministries** | **… departments** within one ministry |
|---|---|---|---|---|
| *Western European countries* | *NFP* | AT DE CH CY FR PT (6) | FI (1) | - |
| | *Non NFP* | SE (1) | - | SCO NO (2) |
| *Eastern European countries* | *NFP* | BG (1) | CZ PL RO SK (4) | - |
| | *Non NFP* | HR (1) | - | - |

(b) Bridging distance: When looking also at which types of public bodies are concerned there are certain differences between the country groups (Table 7). Seven out of ten forest policy documents from Western European countries were coordinated with public organizations other than ministries. Four out of six forest policy documents from Eastern European countries were coordinated with other ministries. It seems that transition countries typically coordinate among different ministries and that traditional democracies more often coordinate also with other public agencies (particularly in the case of NFPs). In summary of both tables, **Western European countries coordinate more often with different types of administrations than Eastern European countries. Both country groups coordinate often across the boundaries of forestry ministries but Eastern European countries tend to coordinate with ministries and Western European countries with other public agencies**.

*Administrative coordination in the formulation of policies – comparison of policy fields*

Figure 16 shows how the policy documents were coordinated among public administrations in each of the seven policy areas. The columns indicate in how many countries the analysed policy documents are coordinated just between departments of the same ministry, between different ministries, or with other public bodies.

When comparing all seven policy fields of our analysis, it shows that most policy documents are well coordinated among public administrations: **In all policy fields, the documents from most countries are coordinated across ministry boundaries.**

Particularly innovation, sustainable development, rural development, forestry and regional development policy documents are strongly coordinated.

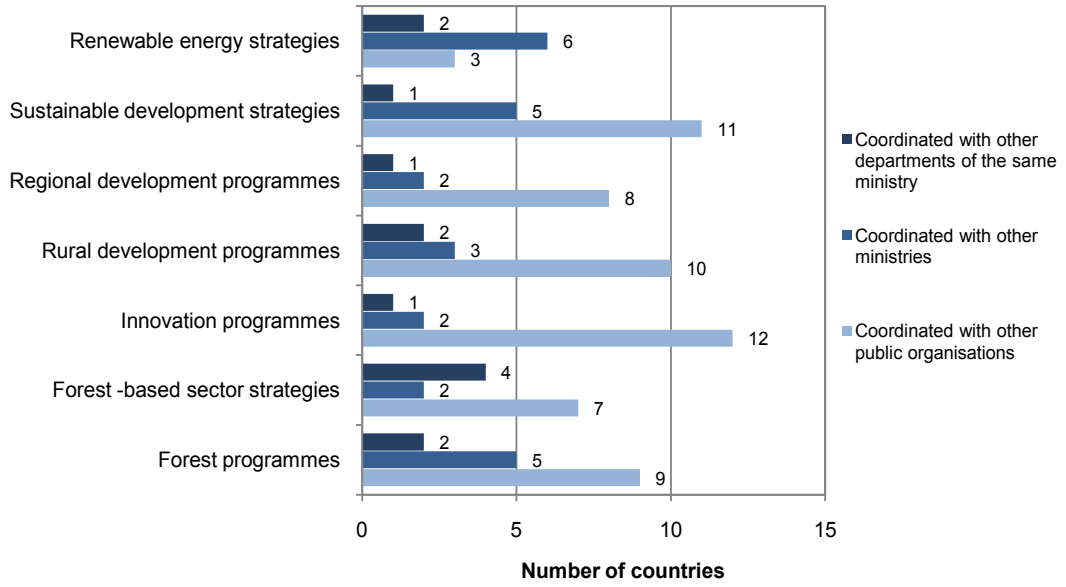


**Figure 16**. Coordination among public administration in the formulation of policy documents – comparison of policy fields (n=19)

*Coordination in the formulation of policies – comparison of countries*

The coordination among public administration was also assessed across countries: According to the results of the questionnaire, policy documents are most often coordinated across ministry boundaries in Bulgaria, Switzerland, Croatia and Slovakia (Table 8).

A comparison of Western with Eastern European countries shows that there are no strong differences but **transition countries tend to have policy documents more often coordinated across ministry boundaries** (in average, five policy documents from Eastern European countries are coordinated with other ministries or other public bodies compared to around four policy documents from Western European countries). When comparing this with the field of forestry, we see that the situation is different with forest policy documents where Western European countries coordinate better across ministry boundaries.

### *8.2. Involvement of stakeholders in the policy formulation process*

The analysis of stakeholder involvement refers to the participation of private actors in policy formulation such as in the form of consultation processes or the inclusion of stakeholders in formal bodies and decision making processes. The questionnaire asked which stakeholders were involved in the formulation of the analysed policy documents. Again multiple answers were allowed. For the answers, the following groups of stakeholders were provided:

- Forestry,
- Forest based industry,
- Agriculture,
- Tourism,
- Energy,
- Environment, and
- Other.

In the category “other,” stakeholders from very different sectors were named by

**Table 8**. Coordination among public administration in the formulation of policy documents – comparison of countries

| | Coordinated with other ministries or other public organisations | Coordinated with departments of the same ministry |
|---|---|---|
| *AT* | 4 | 2 |
| *BG* | 7 | - |
| *CH* | 6 | - |
| *CY* | 3 | 1 |
| *CZ* | 5 | - |
| *DE* | 5 | - |
| *EE* | 3 | 1 |
| *FI* | 5 | 1 |
| *FR* | 5 | - |
| *HR* | 6 | 1 |
| *IT* | 1 | - |
| *NO* | 4 | 2 |
| *PL* | 5 | 2 |
| *PT* | 5 | 2 |
| *RO* | 2 | - |
| *SK* | 7 | - |
| *SWE* | 4 | - |
| *UK/Sco* | 4 | 2 |

the respondents, for example trade unions, experts, commerce, local/regional representatives, hunting associations, youth, etc.

*Stakeholder involvement in the formulation of forest policy documents*

For the analysis of forest policy documents, information from 15 countries is available. In most countries, **stakeholders from many different sectors were involved in the formulation of forest policy documents**. Forest policy documents are mostly elaborated with the participation of stakeholders from the forestry and environment sector, followed by forest industry, agriculture and tourism. It seems remarkable that tourism is involved to a similar extent as forest industry or agriculture. This indicates that the use of forests for recreation is a significant issue in most countries. Energy policy actors have not yet been involved so strongly (Table 9).

When comparing NFPs with non-NFPs and Western with Eastern European countries there are no big differences in the participation of stakeholders. It seems that the concept of NFPs as defined in international policy processes on global and European levels which calls for the inclusion of interested stakeholders in the formulation of forest policies has **gained broad acceptance** in European countries, no matter if the documents are “official” NFPs or other policy documents, and no matter if Western or Eastern European countries.

**Table 9**. Stakeholder involvement in policy formulation – Forest policy documents

| | Forestry | Forest-based industry | Agriculture | Tourism | Energy | Environment | Other | Total |
|---|---|---|---|---|---|---|---|---|
| *AT* | X | X | X | X | X | X | - | **6** |
| *BG* | X | X | X | X | X | X | X | **7** |
| *CH* | X | X | X | X | X | X | - | **6** |
| *CY* | X | X | - | X | X | X | - | **5** |
| *FI* | - | - | - | - | - | - | - | **-** |
| *FR* | - | - | - | - | - | - | - | **-** |
| *GE* | X | X | X | X | - | X | - | **5** |
| *HR* | X | X | - | - | X | X | X | **5** |
| *NO* | X | X | X | X | - | X | X | **7** |
| *PL* | X | X | X | X | - | X | - | **6** |
| *PT* | - | - | - | - | - | - | - | **-** |
| *RO* | - | - | - | - | - | - | - | **-** |
| *SK* | X | X | X | - | - | X | - | **4** |
| *SWE* | - | X | - | - | - | - | - | **1** |
| *UK/Sc* | X | - | X | - | - | X | - | **3** |
| **Total** | **14** | **12** | **10** | **10** | **6** | **14** | **4** | |

*Stakeholder involvement in policy formulation – comparing policy fields*

The next diagram shows how many of the seven given stakeholder categories (forestry, forest-based policy, environment, energy, tourism, agriculture and other) were involved in each of the seven policy fields in the countries. Most countries stated an involvement of three to five stakeholder categories.

Figure 17 is not an absolute image of how many stakeholders were involved in total, as the predefined stakeholder groups are focused on forestry and related sectors. As expected, forestry and related interest groups are mostly involved in the formulation process of forestry and forest industry policy documents. They are less involved in sustainable development and renewable energy strategies.

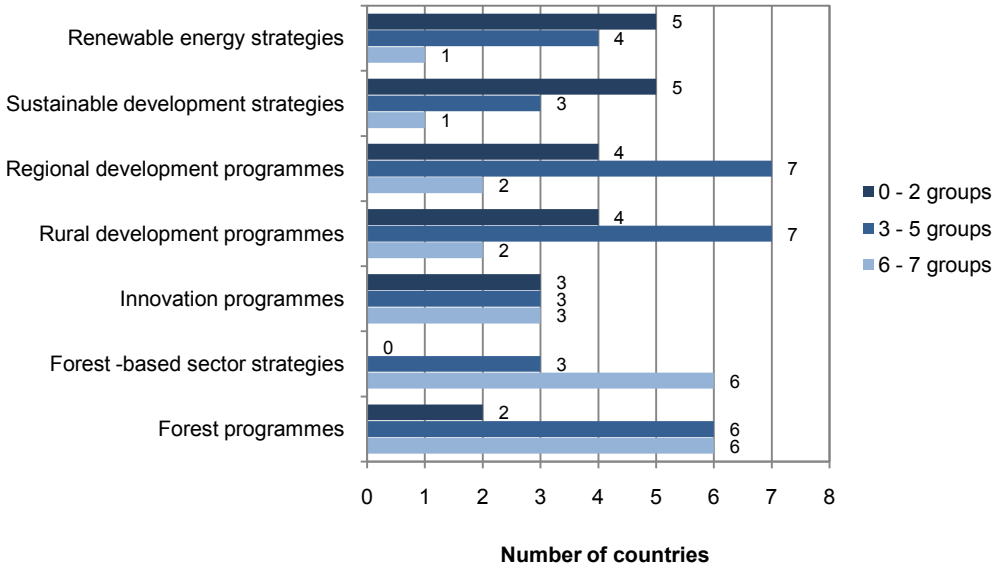


**Figure 17**. Stakeholder involvement in policy formulation – comparison of policy fields (n=19)

**Table 10**. Stakeholder involvement in policy formulation (number of countries for the inclusion of each stakeholder group in the analysed policy fields)

| | Forestry | Environment | Forest-based industry | Agriculture | Tourism | Energy | Other | Mean |
|---|---|---|---|---|---|---|---|---|
| *Forest programmes* | 14 | 14 | 12 | 10 | 10 | 6 | 6 | **10,3** |
| *Forest-based sector strategies* | 10 | 6 | 10 | 3 | 3 | 4 | 11 | **6,7** |
| *Innovation programmes* | 1 | 2 | 2 | 1 | 3 | 3 | 10 | **3,1** |
| *Rural development programmes* | 11 | 8 | 4 | 10 | 4 | 3 | 9 | **7,0** |
| *Regional development programmes* | 6 | 7 | 5 | 6 | 6 | 5 | 5 | **5,7** |
| *Sustainable development strategies* | 10 | 10 | 7 | 8 | 7 | 7 | 9 | **8,3** |
| *Renewable energy strategies* | 4 | 5 | 4 | 2 | 1 | 8 | 2 | **3,7** |
| **Mean** | **8,0** | **7,4** | **6,3** | **5,7** | **4,9** | **5,1** | **7,4** | |

Table 10 indicates more precisely in how many countries which stakeholder groups are involved in the formation of the different policy documents. It is visible that forestry, environment, forest-based industry and agriculture groups are particularly involved in the analysed policy fields. Again, in the interpretation of the figures the stronger representation of forestry-related interest groups in the design of the questionnaire has to be considered.

### *8.3. Coordination mechanisms in policy formulation*

The coordination of actors in the formulation of policy documents may be formalized or take place in an informal way. Since the analysis of informal co-ordination cannot be done from document analysis, the analysis focuses on formal coordination.

The questionnaire asked which coordination mechanisms were employed in the formulation of the policy documents. The formal coordination mechanisms were defined as follows (multiple answers allowed):

- Formal (central) coordination body
- Formal coordination process
- Inter-sectoral working group
- Inter-sectoral advisory body
- Formal mandatory consultation process
- Formal voluntary consultation process

**Table 11**. Coordination mechanisms in the formulation of forest policy documents

| | | Formal body | Formal process | Working group | Advisory body | Formal mandatory consult. | Formal voluntary consult. |
|---|---|---|---|---|---|---|---|
| *Western European countries* | *NFP* | AT CH CY FI FR GE PT (7) | AT CH FI FR (4) | CH FI FR (3) | AT FI (2) | CH FI FR (3) | FR GE (2) |
| | *Non-NFP* | NO SE (2) | SCO (1) | - | - | SE (1) | SE (1) |
| *Eastern European countries* | *NFP* | CZ PL RO (3) | - | - | SK (1) | - | - |
| | *Non-NFP* | - | BG HR (2) | BG (1) | - | - | - |
| **Total** | | **12** | **7** | **4** | **3** | **4** | **3** |

*Coordination mechanisms in the formulation of forest policy documents*

The Table 11 shows which forms of coordination are used in the formulation of the forest policy documents in which countries of our analysis (16 reports are available). The most frequent form of coordination in the forest policy documents seems to be a **formal central body** that is in charge of the coordination process (in 12 countries). Sometimes a formal process is connected (4 cases), sometimes only a formal process is installed without having a formal body (3 cases). Other means of coordination were mentioned less frequently and mostly as additional mechanisms.

When comparing traditional democracies to transition countries it seems that traditional democracies use a greater variety of coordination mechanisms in the coordination of forest policy documents when compared with transition countries which most frequently tend to install a formal body for coordination. NFPs encompass more diverse coordination mechanisms when compared with other forms of forest policy documents.

*Coordination mechanisms in policy formulation – comparing policy fields*

The following Figure 18 shows, for all analysed policy areas, the number of countries in which the different kinds of coordination mechanisms are used. **Formal coordination bodies** remain the dominating form of coordination in all policy areas. The formal body is often complemented by other means – a formal process, working group, advisory body, or consultation.

The comparison of the different policy fields shows that forestry, forest sector, rural development and sustainable development policies are coordinated by more diverse mechanisms. When looking more closely at the data it shows that they are often used in combination within the same countries (see also the detailed analysis of forest policy in the sub-chapter above as an illustrating example). Possible explanations could be that in the mentioned policy areas a formal cross-sectoral coordination is more advanced than in many other policy fields, that they are more cross-cutting by nature, or that these policy fields do not dispose of strong own steering instruments.

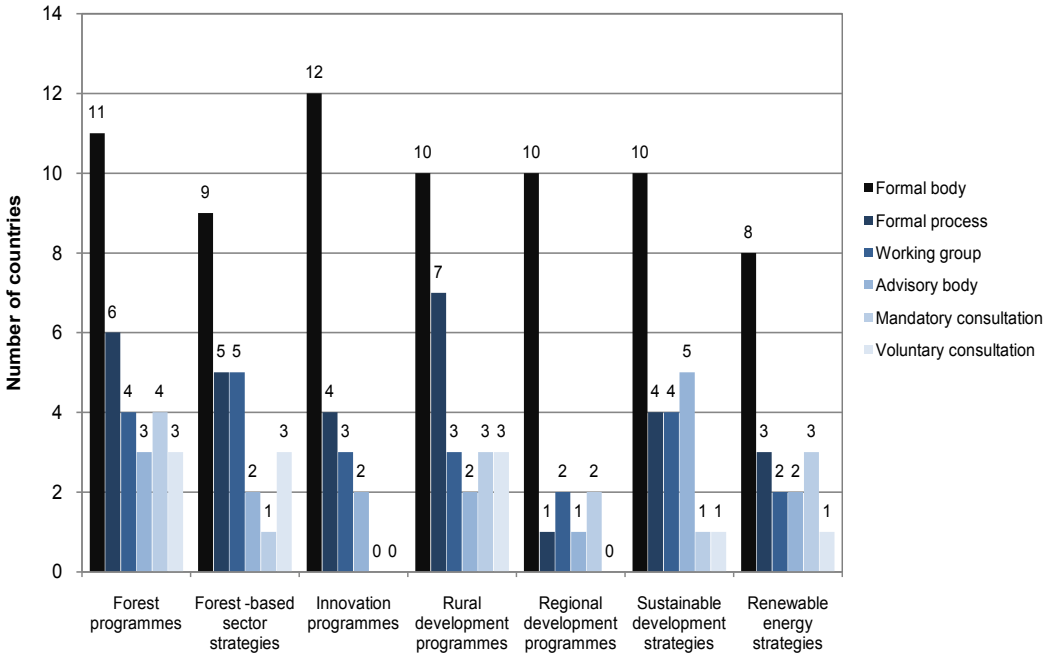


**Figure 18**. Coordination mechanisms in policy formulation – comparing policy fields (n=19)

### *8.4. Level of centralization/decentralization in policy implementation*

The questionnaire asked at which level of administration the policy is implemented, including a delegation to private actors. The following categories were given in the questionnaire (multiple answers were allowed):

- Decentralized
- Central, e.g. ministry, public agency
- Outsourced to private actors
- Local, e.g. by municipalities
- Regional, e.g. by regional public actors
- Others

The public administration is often not free to decide on the implementation process as this is often defined by the countries' constitutions.

*Level of implementation in forest policy documents*

The implementation of forest policy documents takes mainly place on the **central level**, exclusively or in addition to other levels (12 out of 17 documents). For five documents also or only an implementation on a decentralized basis was mentioned, for five the local level, for four private actors and for three also regions.

**Table 12**. Level of implementation – Forest policy documents

| | | Central | Decentralized | Local | Regional | Outsourced to private actors | Other |
|---|---|---|---|---|---|---|---|
| *Western European countries* | *NFP* | AT CH CY FI FR (5) | AT CH DE PT (4) | CH FR PT (3) | CH FI FR (3) | AT CH PT (3) | AT (1) |
| | *Non NFP* | NO SWE (2) | IT (1) | SCO (1) | - | SWE (1) | - |
| *Eastern European countries* | *NFP* | CZ RO SK (3) | - | - | - | - | PL (1) |
| | *Non NFP* | BG HR (2) | - | BG (1) | - | - | - |
| **Total** | | **12** | **5** | **5** | **3** | **4** | **2** |

When comparing NFPs with other types of forest policy documents, there is a tendency that NFPs are – more than other documents – implemented on more than just on the central level. When comparing West and East it can be stated that forest policy documents of Western European countries are implemented on various levels whereas Eastern European countries tend to implement their forest policies on a central level only (see Table 12).

*Level of policy implementation – comparing policy fields*

The following Figure 19 shows on which levels the different policy areas are implemented in the countries of our analysis.

Although the general picture is that a central implementation of policies dominates in all policy fields, still some interesting sectoral differences can be observed.

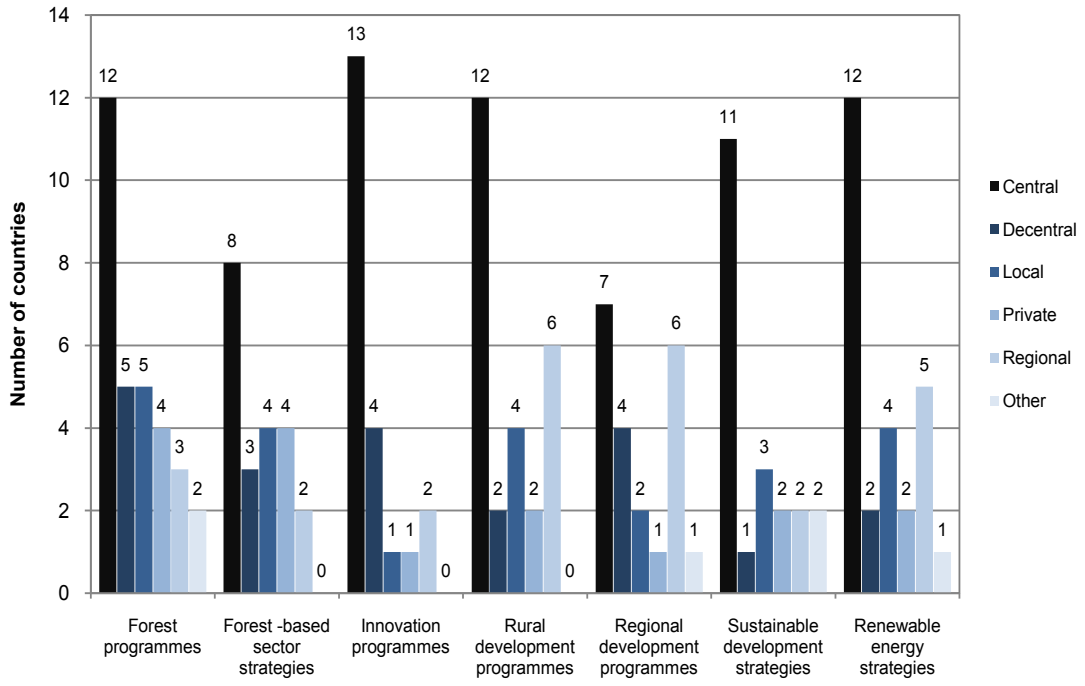


**Figure 19**. Level of policy implementation – comparison of policy fields (n=19)

An implementation on the central level prevails in all policy fields. In the rural and regional development as well as renewable energy policies the implementation is often also, sometimes only on the regional level. The forestry policy seems to be more decentralized than other policies. Regional and rural development policies are often implemented on regional level. The innovation policy seems to be a typical centralized policy.

## 9. Summary results and discussion

The forest sector is not as static as often perceived. Societal changes exert pressure on forestry and the forest-based sector and bring about dynamic consequences. The big societal trends in Europe, and globally, have their repercussions in forestry and the forest-based industry: growing demands for recreation, climate change mitigation, and globalisation – these trends are visible also in the innovation activities in the sector. According to the expert assessments in the frame of the work in COST Action E51, recreational and educational services as well as bio-energy products are the most frequent recent product innovations in forestry in European countries. New forms of marketing are important developments related to new services just like to traditional forest products. Further, a range of process innovations aim at rationalising timber production: harvesting methods, ICT, and advanced logistic systems are focus areas for new developments in the sector. An interesting observation relates to the differences between territorial services and wood products: horizontal and vertical cooperation is of growing importance in forestry and the wood value chains; in the production of territorial services, mere cooperation of firms is important but effective solutions are searched beyond and include cross-sectoral coordination initiatives on regional scale. So, while in timber and bio-energy production vertical and horizontal business co-operations are suitable and important new organisational solutions, the effective production of ecosystem services often needs new institutional arrangements that firms alone cannot manage without external support. Public or semi-public organisations and interest groups have specific new tasks to perform here. Regional authorities, public sector administration, regional development offices, regional co-operations of municipalities, extension services, or sector organisations such as chambers, forest owners' associations or cluster organisations are examples for constructions that may play important roles.

*The innovations answer to social challenges, but there are also blind spots*

Looking at these results, it seems that the reported innovation foci in the countries answer to the big challenges of today. Relatively little is found, however, in the fields of environmental services (with regard to biodiversity conservation and carbon sequestration), sustainable building, chemical products or food from forest sources.

These results at least show that innovation activities seem to go by and large in a right direction. However, with this it is not said that the innovations sufficiently answer the demands. Other studies come to the result that the sector is dynamic but the level of innovation activities is very low in smaller forest holdings and that the rate of radical innovations lags behind other sectors (Rametsteiner et al. 2005). While many would say that in a traditional sector no big innovations can be expected, some see the forest sector as one of the key sectors of the future because it can provide solutions for some of the biggest challenges of our society – related to climate change, renewable energy and environmentally friendly materials, as well as biodiversity conservation. Within the EU Lead Markets Initiative for Europe (LMI), the forest sector is prominently represented as it contributes to themes such as bio-energy, sustainable construction, and bio-based products.[5]

A lacking final answer to that does not prevent us asking the question how innovation is

[5] For the LMI, see http://ec.europa.eu/enterprise/policies/innovation/policy/lead-market-initiative/.

actually dealt with in sector-related policies and how relevant policies are coordinated in this question? These are the questions at the core of COST Action E51. Answers to these questions may explain levels of innovation activity and success of the sector in finding new answers to societal challenges. They may even give indications if we could expect better solutions in the sector even if we do not know of which kind these could be: if the analysis of policies shows that they lack orientation at innovation at all, or fail in coordination in vital fields, we can assume that many opportunities are missed. Earlier studies of forest innovation systems reveal significant weaknesses in Central European policies, for instance, lacking explicit sectoral innovation policies, weak connection of the sector to the national innovation system and policies, and poor coordination across relevant sectors (Rametsteiner et al. 2005).

*Forest policy not strongly innovation-oriented*

How is innovation integrated in relevant policy documents? Our analysis asked about the innovation orientation of policy goals, the integration of innovation issues and the support of innovations by policy measures. The policy fields from which we analysed selected documents seem to integrate innovation in quite different ways. There is a group of policy fields which seem to be strongly oriented at innovation: innovation programmes, regional development and rural development programmes and forest-based industry strategies often formulate many innovation related goals and objectives, often pose many innovation related issues and problems, mention the term “innovation” relatively frequently, and overall give a relatively high relevance to innovation. The importance of innovation support measures is also relatively high in these documents.

The forest policy documents do formulate innovation relevant goals and issues, but overall, innovation does not appear often and does not appear to be an important issue. Sustainable development and renewable energy strategies are the least innovation oriented documents of our analysis.

*Forest sector disconnected from national innovation policies*

Innovation frontiers of the forest sector are frequently mentioned in forest programmes, and sometimes also in rural development programmes, forest-based industry and renewable energy strategies. In most countries, forestry issues are not found in innovation and regional development policies. This is an indication that forestry is not closely connected to innovation policies.

*Traditional understanding of innovation policy*

Policy areas that are closer to forestry and mention innovation fields that are particularly relevant for forestry, are the forest-based industry, rural development and renewable energy policies. These policies, at the same time, have a rather traditional understanding of innovation policy – which implies that in their rather linear innovation model they focus on research and diffusion of innovation and have relatively less awareness for the importance of inter-sectoral cooperation and other systemic measures of innovation support.

*Three types of policies*

It is an interesting result of this analysis, that the relevance that is put on the topic of innovation in the documents does often, but not always go along with the same basic understanding of innovation policy, traditional or systemic. Policies that mention many innovation related goals and issues, also mention the term innovation quite frequently, give innovation a rather high importance and address innovation related issues quite specifically. They are: national reform programmes, rural and regional development programmes, and forest sector strategies. These policies tend to follow rather a systemic understanding of innovation. The forest programmes and renewable energy plans, on the contrary, do not mention innovation so frequently and represent a rather traditional view on innovation. The sustainable development strategies are a third type: they do not mention innovation frequently but often follow a systemic understanding of innovation.

We thus find three groups of policy fields: strongly innovation-oriented policies with a rather systemic understanding of innovation policy (national reform programmes, rural and regional development programmes, and forest sector strategies), less innovation oriented policies with a traditional understanding (forest programmes and renewable energy plans), and a less innovation oriented policy field with a systemic understanding (sustainable development strategies).

*Systemic rhetoric but traditional measures*

The allocation of the policy documents to traditional or systemic understanding, however, requires further relativisation: not all documents that talk very systemically about innovation also choose typical systemic support measures: innovation policy documents and regional development programmes are those with the strongest systemic rhetoric, but the employed measures are rather traditional. It seems that existing policy instruments cannot be adapted quickly to changing policy goals and approaches.

*Support for diffusion but not radical innovation*

For forest policy documents it can be said that there is some general awareness for innovation issues in the sector and current innovation frontiers are tackled in the documents. Overall, however, innovation issues are not systematically integrated into the policies and innovation as such is not specifically supported. As a consequence, the policies hardly support radically new ideas but only the diffusion of current solutions and technologies that are already known. This goes along with the observation of innovation research that the institutional system of mature sectors rather focus on rationalisation and diffusion of innovation and are less supportive of the development of new products or services (Breschi and Malerba 1997). These internal weaknesses of the sectoral innovation system are complemented by a weak external support for the sector by national innovation systems or innovation policies. The orientation at traditional innovation support tools and an ignorance of systemic approaches within the sector furthermore fails to stimulate innovative ideas and to support innovation systematically.

*Forest policies are formally well coordinated among public bodies and stakeholders*

In how far are relevant policy areas coordinated? For an effective support of innovation, the coordination of policy fields is important, the more so for a diversification into new forest goods and services. The analysis asked how the policies that are relevant for the support of innovation in forestry are coordinated among public administration and with stakeholders. Forest programmes are among those policy documents with the strongest formal coordination with other ministries or other public organisation, together with innovation, sustainable development, as well as rural and regional development policy documents.

Within forest policy we have analysed NFPs for those countries, where they existed, and other central policy documents in countries without NFPs. According to the analysis, there is no strong difference between these two groups of documents, but a tendency is seen that NFPs support a more systematic and broad inclusion of public bodies in the formulation process and thus support bridging to “more distant” public entities. For the involvement of stakeholders no clear difference between NFPs and other documents is visible. It seems that the concept of NFPs as defined in international policy processes which call for the inclusion of interested stakeholders in the formulation of forest policies has gained broad acceptance in Western and Eastern European countries alike, and no matter if the documents are formally NFPs or other policy documents. NFPs, however, employ more diverse formal coordination mechanisms in comparison.

Among formal coordination mechanisms, formal bodies dominate. It is often complemented by other means such as a formal process, working group, advisory body, or consultation. When comparing the different policy fields it shows that more diverse mechanisms are employed in the

coordination of forestry, forest sector, rural development and sustainable development policies. These mechanisms are often used in combination within the same countries. Possible explanations may be that in the mentioned policy areas the formal cross-sectoral coordination is more advanced than in other policy fields, that they are more cross-cutting by nature, or that these policy fields do not have strong competences and steering instruments and therefore have to rely more strongly on coordination processes with possibly competing policies.

The analysis focused on those stakeholders that are particularly relevant for forestry: forest, forest industry, environment, agricultural interest groups, but also tourism and energy related organisations. They are naturally more often involved in the formulation of policy documents in the fields of forestry and forest-based industry. The comparative analysis shows that tourism is quite frequently involved, while energy-related groups less often. The recreational value of forests seems to be a traditionally important service in many countries, while the issue of renewable energy is maybe still a new field in some countries. Furthermore, for tourism, interest groups do exist that actively lobby for their interest in the forest policy making process while the energy sector as such does not intervene in the forest sector policy making.

*Symbolic policy vs, substantial coordination*

Forest policy documents seem to be relatively well coordinated with other sectors, and even without a generally strong systemic orientation of innovation policy there is a focus on cross-sectoral interaction as a tool for innovation support. In relation to other traditional sectors, it seems that forestry is rather used to coordinate across sectoral boundaries. These results contradict to what is known from extensive forest policy research and from earlier innovation research – for example in Austria (Glück, 1976; Rametsteiner and Kubeczko, 2003; Hogl and Nordbeck, 2007). Rametsteiner et al. conclude for Central European countries that cross-sectoral cooperation for innovation support is largely lacking (Rametsteiner et al. 2005). For the example of Austria it is shown in detail, that other sectors hardly play a role in the sectoral innovation system; this is certainly true on national level, less so on local-regional levels (Rametsteiner and Weiss, 2006).

*Policy coordination forced from outside*

An explanation for these contradictory results may be the difference between the formal goal of coordination and the effective implementation which might lack behind the goal. Explanations might possibly also be found in the generally weak orientation of forest policies at innovation as such or in the quality of cooperation. The generally limited relevance of innovation within forest policy could explain why the cross-sectoral communication is not utilised effectively for innovation support. Furthermore, the coordination with other sectors is often rather forced because of strong interests from other social groups and the mode of coordination is often more a negative than a positive coordination (Hogl and Kvarda, 2008). In the field of innovation this is reflected by the observation that innovations are often not so much opportunity-driven but rather demand-driven and forced upon the sector, for instance, in ecosystem services of forests and forest-related recreation (Weiss and Rametsteiner, 2005). The development of bio-energy from forests is an example for an opportunity-driven innovation in forestry, however, the initial support came from other sectors than from the forestry innovation system (Weiss, 2004; Kubeczko et al. 2006).

## 10. Concluding remarks

The analysis conducted here was a rare possibility to compare policy documents from different policy fields across a large number of countries. The extensive data collection work was crucially supported by the framework of the COST Action E51 which brings together experts from many European countries. With the large set of analysed documents being the strength of this endeavour, its weakness is

the still shallow analysis: From each policy field only one document has been chosen and no accompanying interviews were possible because of limited budgetary resources. For this reason, for instance, only formal coordination mechanisms could be included in the analysis although we know that informal coordination and consultation with public and private actors is an important feature in the policy-making processes. Policy documents, furthermore, usually do not describe accurately underlying factors for certain policy decisions or policy change. The analysis furthermore was largely restricted to the formulation phase and did not include their implementation.

Although a well-defined common questionnaire with detailed guidelines was used for data collection, a further certain weakness lies in the fact that the data collection was done by a large number of researchers which compromises the standardisation and reliability of the assessments. It seems that we were able to control this sufficiently by the standardised questionnaire with detailed guidelines for its completion. Cross-checks between related questions hardened the confidence of the authors in the central results. Less reliable questions, for instance, were directed to the importance of innovation support measures and these results were partly excluded from the analysis.

A number of interesting insights can be derived from the analysis, for instance, with regard to the following questions:

- How policy fields differ in their innovation-orientation, characterisation of issues, integration of innovation and how this is constant across countries;
- How policy fields differ in their expressed understanding of innovation policies and how innovation rhetoric's are not always consistent with the chosen measures for innovation support;
- How countries differ from each other with regards to the relevance they assign to innovation and which understanding of innovation policy they follow across different policy fields;
- How NFPs are actually not so different from other forest policy documents when it comes to coordination across sectors and with stakeholder groups.

Some of these insights are well substantiated with results from several related questions and with the qualitative analysis of extracted texts. Some of the results go along with established knowledge about innovation policies and innovation systems in forestry, but some results are new scientific knowledge. Some analysis results are exciting observations but lack the in-depth explanations. These questions would require further investigation by the analysis of further documents, by additional interviews with policy-makers and stakeholders, or by extended case study analyses. Some of the participants in the COST Action aim to further study these questions in ongoing or future research projects.

The further work in the COST Action E51 which focuses on the firm level and local level of innovation processes should be able to answer some of these open questions.

***Acknowledgements***

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## 12. References

Bauer, A. and Rametsteiner, E. (2007) Policy integration and coordination: theoretical, methodical and conceptual aspects. Proceedings of the 1st COST Action E51 Joint MC and WG Meeting 12-14 October 2006, Grosspetersdorf, Austria. E. Rametsteiner. Vienna, University of Natural Resources and Applied Life Sciences: 31-48.

Breschi, S. and Malerba, F. (1997). Sectoral Innovation Systems: Technological Regimes, Schumpeterian Dynamics and Spatial Boundaries. Systems of Innovation. Technologies, Institutions and Organizations. C. Edquist and B. Johnson. London and Washington, Pinter: 130-156.

Edquist, C. and Johnson, B. (1997). Institutions and Organizations in Systems of Innovation. Systems of Innovation. Technologies, Institutions and Organizations. C. Edquist. London and Washington, Pinter.

Glück, P. (1976). Die Rolle der Verbände in der theoretischen Forst- und Holzwirtschaftspolitik (Habilitationsschrift). Wien, Universität für Bodenkultur Wien.

Goorden, L. (2004). Innovation Policy and Technology Assessment in Flanders. Antwerp, STEM – Research Centre on Technology, Energy and Environment, 40.

Hogl, K. and Kvarda, E. (2008). The Austrian Forest Dialogue: Introducing a new mode of governance process to a well entrenched sectoral domain. Research Report 1-2008. Wien, Institute of Forest, Environmental and Natural Resource Policy.

Hogl, K. and Nordbeck, R. (2007) Impulse zum Wandel von Interessen und AkteurInnennetzwerken in der österreichischen Waldpolitik: Das Beispiel des Österreichischen Walddialoges. OeZP – Oesterreichische Zeitschrift fuer Politikwissenschaft, 4, 405-424.

Kubeczko, K., Weiss, G. and Rametsteiner, E. (2006) The Role of Sectoral and Regional Innovation Systems in Supporting Innovations in Forestry. Forest Policy and Economics, 8, 704-715

OECD (2005). Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data. Paris, OECD.

Rametsteiner, E. and Kubeczko, K. (2003). Innovation und Unternehmertum in der österreichischen Forstwirtschaft. Wien, Universität für Bodenkultur.

Rametsteiner, E., Kubeczko, K. and Weiss, G. (2005). Innovation and Entrepreneurship in Forestry in Central Europe. Leiden, Brill.

Rametsteiner, E. And Weiss, G. (2006). Assessing Policies from a Systems Perspective. Experiences with Applied Innovation Systems Analysis and Implications for Policy Evaluation Designs and Methods. Forest Policy and Economics, 8, 564-576

Weiss, G. (2004) Die Rolle von Innovationssystemen in der Entwicklung und Verbreitung von Biomassefernwärmeanlagen in Österreich. Centralblatt für das gesamte Forstwesen, 121(4), 225-242.

Weiss, G. and Rametsteiner, E. (2005) The Role of Innovation Systems in Non-Timber Forest Products and Services Development in Central Europe. Economic Studies, XIV(1), 23-36.

Chapter V

# Support for Innovation in Forestry in Rural Development Programmes of Six European Countries

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## 1. Introduction and objectives

Rural development is a vitally important policy area, because rural areas cover 91% of the territory in the 27 Member States of the European Union (EU) and over 56% of the population live there (CAP EU). Extremely diverse physical environments characterize rural areas in Europe, as well as a broad range of economic activities, unique social networks and centuries-old cultural traditions. Rural areas across Europe differ strongly in their prosperity, among others, depending on their resources, accessibility, distance to large agglomerations, etc. Many European rural areas face significant challenges e.g. building competitiveness and creating new job opportunities. In marginal areas farming and forestry businesses often still need rationalization, or to develop new products and service. On the other hand, they have a great deal to offer. They give essential raw materials and provide a place of beauty, rest and recreation. The EU rural development policy is about meeting the challenges faced by rural areas, and unlocking their potential. Rural Development Policy is European Union is a key tool for restructuring of the agriculture sector, and to encourage diversification and innovation in rural areas. Rural Development's main targets are economic growth and creating jobs in rural areas and greater competitiveness in world markets, together with strengthening a better standard of living in an environmentally and socially sustainable way.

Even if economic activity tends to be concentrated in more urban areas, rural areas generate 42% of the Gross Value Added in EU-27 and provide 53% of the employment, these shares being larger in the new Member States (74% and 83% respectively). Agricultural and forestry sectors are very important for the rural development. The primary sector (agriculture, hunting and forestry) with around 13.44 mio persons employed in 2005 still represents 18% of the employment and 5% of the value added in rural areas of EU-27 (Rural development in the European Union, 2008).

Rural development policy in EU has been implemented through different instruments. Before 2000, the CAP was essentially sectoral (dealing mainly with agricultural structures) with limited territorial aspects. Agenda 2000 established rural development policy as the second pillar of the EU's Common Agricultural Policy (CAP). An important change for the ongoing period (2007-2013) was the movement from separate measures for the forest and the agro-environmental issues to one single regulation for all the measures.

The strategic guidelines published by the European Union on 20 February 2006 (Council decision No. 2006/144/EC) should help to:

- Identify the areas where the use of EU support for rural development adds the most value at EU level;
- Make the link with the main EU priorities (for example, those set out under the

Lisbon and Göteborg agendas);

- Ensure consistency with other EU policies, in particular those for economic cohesion and the environment;
- Assist the implementation of the new market-oriented CAP and the necessary restructuring it will entail in the old and new Member States.

Each member state has to create a national strategic plan which includes all objectives of the strategic guidelines. Thus, the programming of rural development must comply with Community and national priorities and complement the other Community policies, in particular the agricultural policy. A precondition for receiving financial support for developing rural areas is an assessment which includes strength, weaknesses, opportunity and threats of each region. For the financial period 2007-2013, the European Commission has published Council Regulation 1698/2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD). This fund is financed by the total budget for agriculture which includes more than 53 Billion Euros. For rural development, a budget of nearly 11.3 Billion Euros is planned. According to the objectives of the Council Regulation 1698/2005, these 11.3 Billions Euros are available for several measures and activities in the member states for the period 2007-2013. It is more than in the former period 2000-2006 so that more measures can be carried out in the agriculture and forestry sector. However, the requirement to select from a variety of different measures allows the member state to focus the financial support on the particular needs of each country.

According to Council Regulation 1698/2005 the Member States or regions select measures, which are appropriate to implement each specific rural development strategy. Member States or regions can choose measures that reflect their specific needs and set their priorities at national level. The set of particular measures, support description, target groups, eligible activities, monitoring indicator etc. are included in each national or regional Rural Development Programs (RDP).

The strategic guidelines, the Council Regulation 1698/2005 and Commission Regulation (EC) 1974/2005 as well, are implemented in all member states for the programming period 2007-2013. All countries have submitted a Rural Development Plan which includes measures and the related budget. However, different approaches for implementing the objectives of the council regulation can be observed. Some countries are focusing more on economic objectives, others more on ecologic objectives. For this reason, the article analyses the RDP from a number of countries/regions. It focuses on the following questions: Which rural development measures related to forestry are provided by the member states in the ongoing period?

- Are there national priorities in the rural development programmes in supporting the forestry sector?

The study is particularly interested in how far innovation is supported through rural development policy forestry in the countries of our analysis.

## 2. EU Rural Development Policy and Forestry

### *2.1. Three aspects of policy coordination*

Policy integration and coordination is of high relevance for forest policy as it has manifold interferences with a range of other policy areas and sectors, for example rural development (Bauer and Rammetsteiner, 2006). With the “integrated rural development” approach, cross-sectoral co-ordination became a central cornerstone of development strategies for rural areas (Gießen, 2008; Sotte, 2003). Coordination is an important

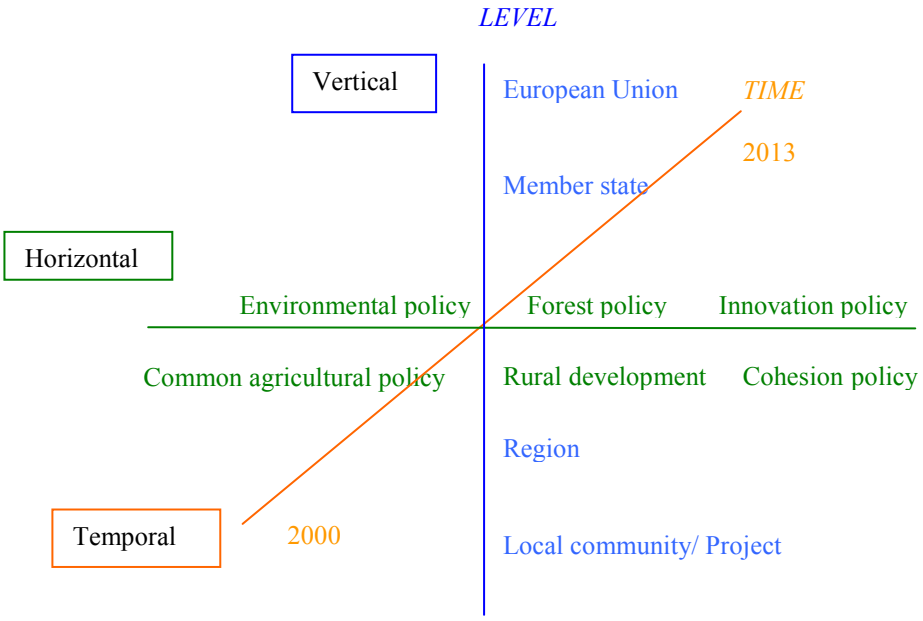


**Figure 1**. Various dimensions in Rural Development Policy coordination (adapted from FAO, 1998)

mechanism in rural development policy. It brings together disparate resources, institutions, actors and targets at various levels including European, national, regional and local. Coordination is needed on several levels – vertical, horizontal and temporal (see Figure 1).

Vertical coordination refers to cooperation among various hierarchical levels of government. Theoretically, individual EU Member State could decide and operate a completely independent rural development policy. However, not all countries in the EU would be able to afford the policy that they needed. Therefore, the EU has a common rural development policy, which nonetheless places considerable control in the hands of individual Member States and regions.

At EU level, general rules for support of rural development policy are introduced. Responsibilities for partnership, programming, evaluation, financial management, monitoring and control are dealing between Member states and Commission on the basis of subsidiarity.

The EU and Member States share the financial cost to implement the rural development programmes (co-financing), but the Member States are fully responsible for the management of their programmes.

A set of particular measures, support description, target groups, eligible activities, and monitoring indicators is included according to each of the four axes in each national or regional RDP. A list of evaluation guidelines and common indicators for monitoring and assessment of RDP is implemented on the base of documents elaborated by EU Commission and members states.

*Horizontal coordination* focuses on linking related policies. It helps to ensure consistency with other EU policies, in particular cohesion and environment. Rural development policy has links to a number of other policies set at EU level, as well as to lower levels, too. There is a strong call for particular coherence between forest policy and rural development policy. Already in 2000 the consensus was adopted that the sustainable management, conservation and sustainable development of forests should be a guiding principle for rural development in forest policy (MCPFE, 2000). Forestry Policy represented by forestry measures in RDP 2007-2013 is adopted in the

light of undertakings given by the Community and the Member States at international level, and based on Member States' national or sub-national forest programmes (NFP) or equivalent instruments. Forestry measures should also contribute to the implementation of the Community Forestry Strategy.

The innovation policy is linked with RDP rather weakly and indirectly. Some aspects that involve innovation are found in the European priorities for rural development. Council Regulation (EC) No 1698/2005, for instance, marks innovative approaches in developing new products, processes and technologies in a context of increased competition in rural areas.

According to Strategic Guidelines for Rural Development these priorities are as follows:

- Contribute to a strong and dynamic European agro-food sector by focusing on the priorities of knowledge transfer, modernisation, innovation and quality in the food chain and priority sectors for investments in physical and human capital;
- Contribute to the priority areas of biodiversity, and preservation and development of high nature value farming and forestry systems and traditional agricultural landscapes, water, and climate change;
- Contribute to the overarching priority of the creation of employment opportunities and conditions for growth;
- Contribute to the horizontal priority of improving governance and mobilising the endogenous development potential of rural areas

*Temporal coordination* refers to achieving an optimal implementation of Rural Development Policy in the EU across programming periods (see Figure 2).

The rural development policy during the previous programming period 2000-2006 was implemented through three different approaches, depending on the country status (EU member or associate country): Special pre-accession assistance for agriculture and rural development (SAPARD), Rural Development Plans, and Sectoral Operational Programmes Agriculture and Rural Development. SAPARD was used during that period in countries with pre-accession status (e.g. Bulgaria, and until 2004 also Czech republic and Slovakia). In EU Member States rural development policy was implemented at a national or regional level through Rural Development Plans and Sectoral Operational Programmes Agriculture and Rural Development.

The Council Regulation (EC) No 1260/1999 laid down general provisions on the Structural Funds. Community has undertaken a reform of CAP which includes structural and accompanying measures for promoting rural development. Through European Agricultural Guidance and Guarantee Fund (EAGGF), regions were supported whose development was lagging behind – defined as those whose per capita GDP is less than 75% of the Community average (Objective 1). The Council Regulation (EC) No 1257/1999 on rural development measures contributed to this policy in regions whose development is lagging behind (Objective 1) and regions facing structural difficulties (Objective 2) as defined in Council Regulation (EC) No 1260/1999. In Slovakia, for instance, the SOP Agriculture and rural development 2004-2006 was territorially bound to Objective 1, which means the whole country except Bratislava County.

The objectives based on Council Regulation (EC) No 1268/1999 for SAPARD were:

- Contribute to the implementation of the *acquis communautaire* concerning the common agricultural policy and related policies;
- Solving priority and specific problems for the sustainable adaptation of the agricultural sector and rural areas in the applicant countries.

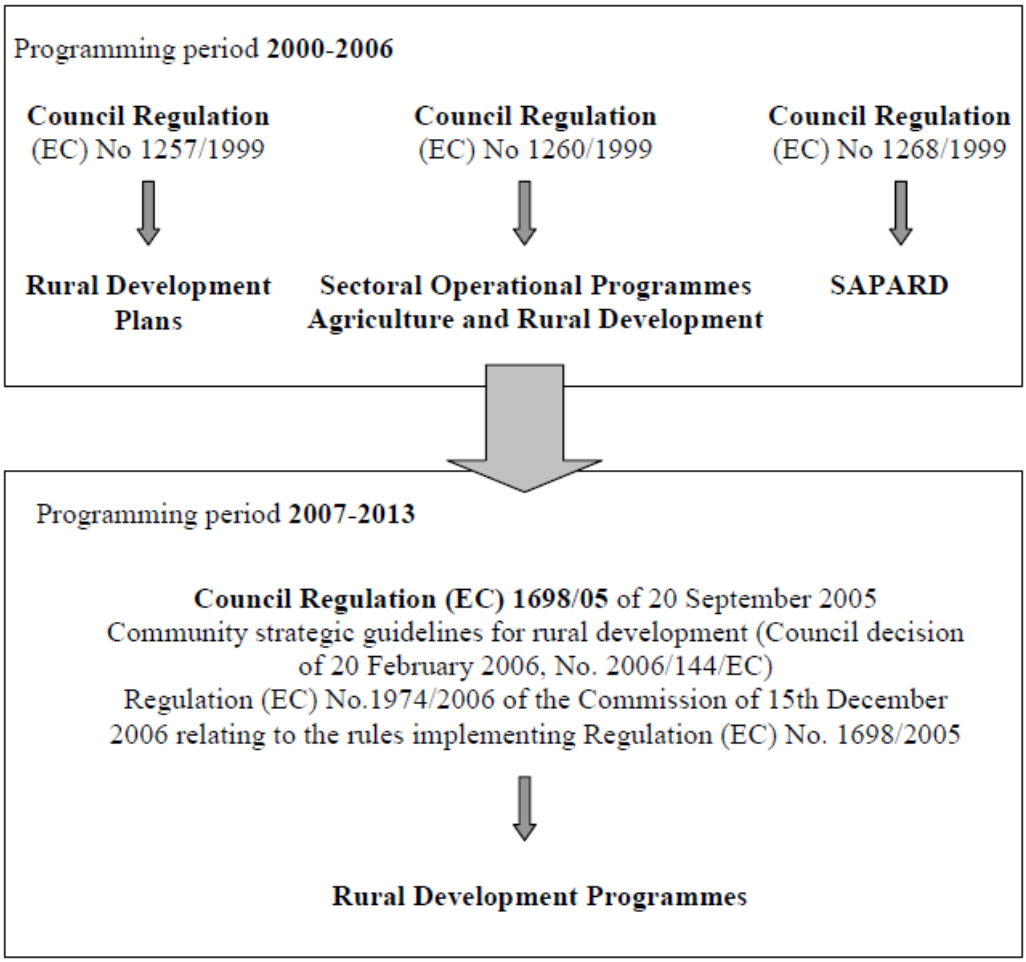


**Figure 2**. The implementation of rural development policy during previous and current planning periods.

Integration of forestry aspects in the rural development policy followed Council Regulation 1257/99, Chapter VIII Forestry were particular aimed at:

- Investments to improve the multifunctional role of forests (Article 30);
- Afforestation of agricultural land (Article 31);
- Improvement of forest protection values (Article 32);

The new Rural Development Regulation No. 1698/2005 puts in place a significantly simpler and more strategic (Handbook on Common Monitoring and Evaluation Framework, 2006) approach to rural development, i.e. through the definition of three core objectives and a reorganisation of sub-objectives and measure objectives. The approach to monitoring and evaluation for the period 2007-2013 is based on the arrangements in the last periods, but will be implemented in a more systematic manner and adapted to a number of new requirements in the RD regulation (Handbook on Common Monitoring and Evaluation Framework, 2006). The main changes can be summarised as follows:

1. Simplification of policy implementation through the introduction of a single funding system,
2. Modification of programming, financial management and control framework for rural development programmes,
3. Definition of three core objectives for rural development measures (Axes1-3), and fourth horizontal and methodological axis is dedicated to the mainstreaming of the LEADER approach.

### *2.2. Rural development in Europe during the period 2007-2013*

For period 2007 to 2013, Council Regulation 1698/2005 is focused on three themes (known as "thematic axes") for rural development:

- Axis 1: Improving the competitiveness of the agricultural and forestry sector
- Axis 2: Improving the environment and the countryside
- Axis 3: The quality of life in rural areas and diversification of the rural economy
- Axis 4: LEADER (Links between actions for the development of rural economy)

Over 40 measures have been designed to achieve the objectives of the EU rural development policy. There are 14 measures under axes 1 and 2 which have objectives directly related to forestry (see Table 1). Generally, these measures aim at promoting sustainable forest management and the multifunctional role of forests. In addition, forestry-related activities, which can play a role in the diversification of the rural economy, can also be supported through some measures under the axis 3.

**Table 1**. RDP measures relevant for forestry for the period 2007-2013

| CMEF code | **Axis 1: Improving the competitiveness of the agricultural and forestry sector** |
|---|---|
| *111* | Vocational training and information actions, including diffusion of scientific knowledge and innovative practices for persons engaged in the agricultural, food and forestry sectors |
| *114* | Use of advisory services by farmers and forest holders |
| *115* | Setting up of farm management, farm relief and farm advisory services, as well as of forestry advisory services |
| *122* | Improvement of the economic value of forests |
| *123* | Adding value to agricultural and forestry products |
| *124* | Cooperation for development of new products, processes and technologies in the agriculture and food sector and in the forestry sector |
| *125* | Improving and developing infrastructure related to the development and adaptation of agriculture and forestry |
| | **Axis 2: Improving the environment and the countryside** |
| *221* | First afforestation of agricultural land |
| *222* | FirsFirst establishment of agroforestry systems on agricultural land |
| *223* | First afforestation of non-agricultural land |
| *224* | NATURA 2000 payments |
| *225* | Forest-environment payments |
| *226* | Restoring forestry potential and introducing prevention actions |
| *227* | Support for non-productive investments |
| | **Axis 3: The quality of life in rural areas and diversification of the rural economy** |
| *323* | Conservation and upgrading of the rural heritage |

## 3. Methods

The overall approach to analyse the rural development programmes is based on a cross-country comparison of forestry measures in the RDP 2007-2013 in selected EU members states or regions. As was shown in Figure 2, different regulations for rural development existed until 2007.

For this article comparison, RDPs for the period 2007-2013 were available from the following eight countries/regions:

- Austria (AT)
- Bulgaria (BG)
- Czech Republic (CZ)
- Germany: North Rhine Westphalia and Saxony (NRW, Saxony)
- Italy: Toscana and Veneto (Toscana, Veneto)
- Slovakia (SK)

All these RDPs are available at the respective official government website. Relevant information from COST Action E51 national reports (Austria, Bulgaria, Germany, Czech republic, Italy, Slovakia) was used as well (Cost Action 51: Country reports).

The intent to analyse RDPs from more countries was not realised because of language barriers and limited availability of the latest version occurs. Furthermore sector data from EUROSTAT and from the European Commission related to Rural Development were not available for all countries/regions.

Due to the fact that definitions in the programmes are only partly comparable (there are different definitions, e.g. in terms of: beneficiaries, ownership type, projects), common comparative criteria had to be identified. The following criteria were selected:

- Land use distribution (using the categories: agricultural land, urban regions, forest or wooded land, rest)
- Afforested area in ha
- Implementation of forestry measures
- Interpretation of measures from the point of view of eligible activities.

The RDPs 2007-2013 were further compared to the former programming period on a country/region and cross country/region level. This intertemporal comparison was possible only for some indicators due to the different definitions mentioned above.

As a result, the main differences are visible and available for detailed analyses. These will be carried out in a later step, which will include expert interviews and structured interviews with questionnaires. This article presents results only from the comparative analysis of countries/regions and programmes as described.

## 4. Results

### *4.1. Forestry in analysed countries/regions*

The chapter gives a brief overview on some of the land use characteristics of EU member states as Bulgaria, Czech Republic, Austria and Slovakia, as well as regions Veneto, Toscana (Italy), North Rhine-Westphalia (NRW) and Saxony (Germany). The forestry ownership structure is presented, because of its relevance for support provided by RDP.

The area distribution of the analyzed countries has some variations. Notable differences can be found in the coverage of urban regions and forest or wooded land (see Figure 3). The category “others” includes rest of land use categories, e.g. water areas or barren land.

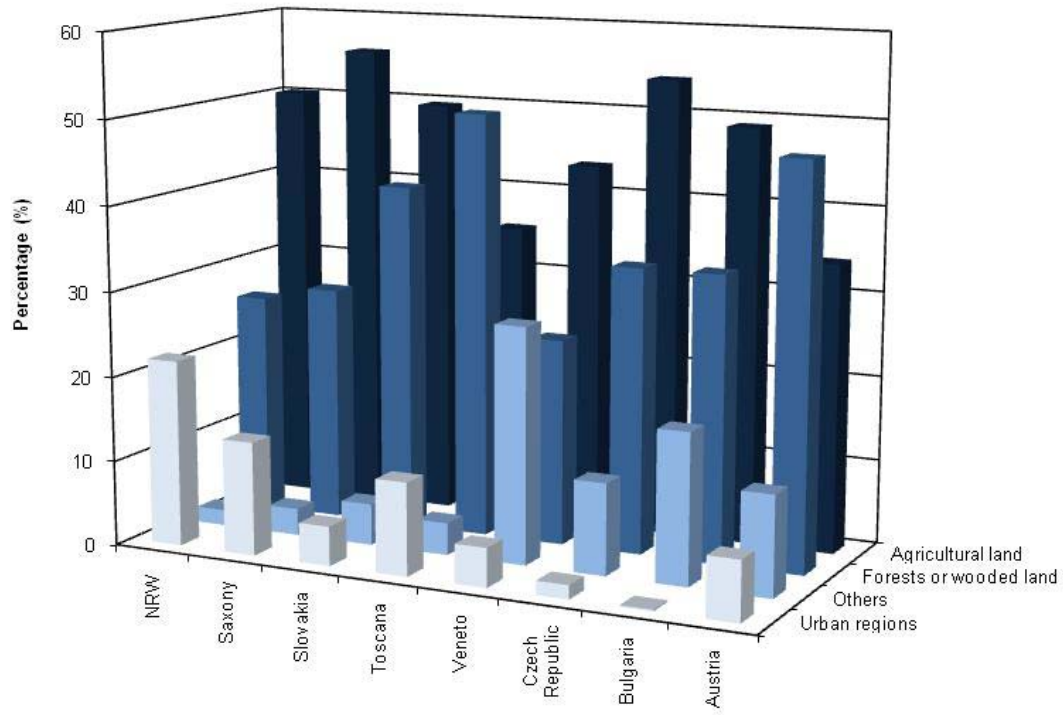


**Figure 3**. Area distribution according land use category

The rural character of regions is given by occurrence and proportion of agricultural and forest ecosystems. The highest value of forest or wooded area from the analyzed countries is in Toscana with 50.1% forests coverage of its territory. Toscana is closely followed by Austria (47.2%), and Slovakia (40.9%). The forest coverage in second group of regions varies between 24.3% (Veneto) and 33.6% (Bulgaria, Czech Republic). German regions are presented with forest cover around 27%.

The coverage of agricultural land is more harmoniously distributed among the countries, remaining mostly in all countries near to a half (see Table 2).

**Table 2**. Coverage of agricultural land in %.

| Region | Saxony | Czech Republic | NRW | Slovakia | Bulgaria | Veneto |
|---|---|---|---|---|---|---|
| **% of agricultural land** | 55.7 | 54.0 | 50.2 | 49.6 | 49.0 | 43.4 |

Toscana and Austria have the lowest percentage of agricultural land with Toscana at 35.2% and Austria at 34.0%.

The ownership structure of the forest areas (see Figure 4) also varies from Veneto's 7.3% state-owned forests to Bulgaria's 78.1%, whereas Austria has the highest share of private-owned forest land with 82.4%. In Slovakia, state bodies own 41% of forests, but also manage the forests of forest owners who have not claimed their properties and forests leased from non-state subjects, together comprising around 55%.

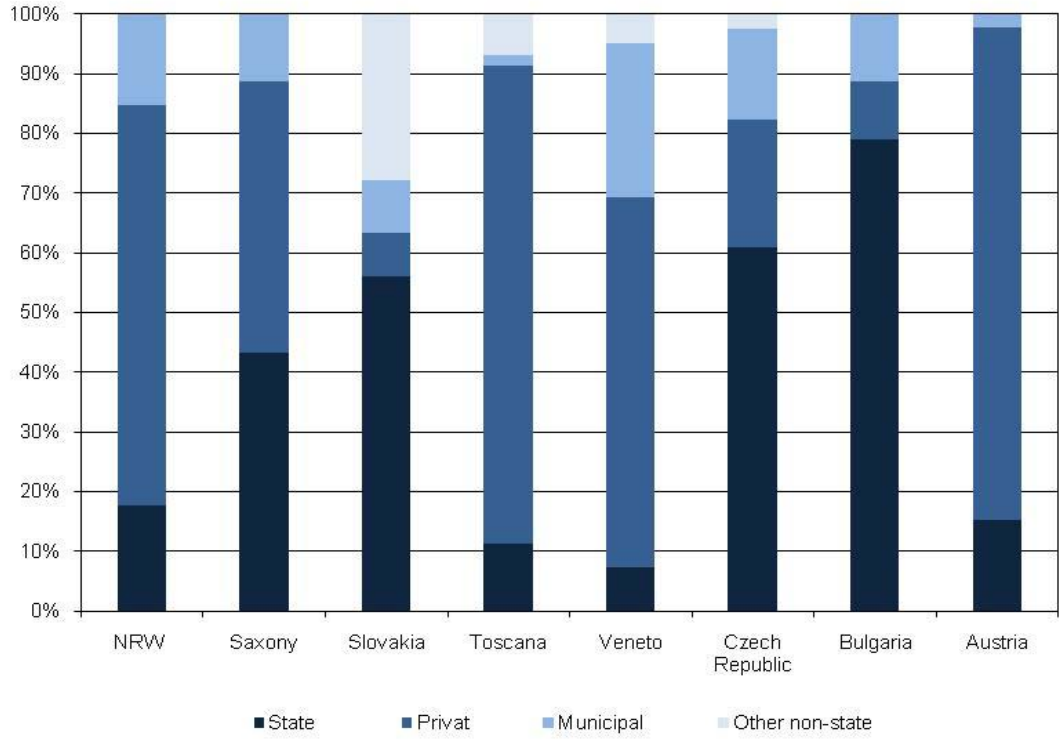


**Figure 4**. Forest ownership distribution

EU stresses an important role of RDP for improving and broadening economic value especially for non-state forestry sector, alongside to maintain the sustainable management and the multifunctional role of forests (Council Regulation 1698/2005).

Around 60% of the EU's forests are in private hands. The particular information from all compared regions is missing, but it would be likely assumed that the small sized forest holdings are more common than large-scale private forest areas. In Bulgaria average private owned forest area is 1.4 ha, in Saxony 2 ha, in Austria it is around 19 ha, in Slovakia 2,8 ha, in Czech Republic 2,9 ha. However, forests and forest-based products, even from small forest holdings, are important for the economy (The EU Forest Action Plan 2007-2011).

Only non-state forest owners are eligible beneficiaries in whole RDP. Different approaches are used for support state forest holdings. In some countries state forests could be supported only from Axis II, in other state foresters could also be target group in measures of Axis I. The comparison of support from RDP in state and non-state forest sector would be possible after ex post evaluation.

### *4.2. Implementation*

For the following analysis of supported forestry measures, all measures have been checked which are oriented towards forest owners as beneficiaries or the main target group or where forestry aspects dominate. These measures are: 122, 123, 125, 221, 222, 223, 224, 225, 226 and 227 as identified in Table 1.

Table 3 presents the results at country level on how the rural development policy measures touching forestry are to be implemented in the particular regions. The titles of measures according CMEF codes are the same as in Table 1. Particular support is more closely discussed below in terms of eligible activities that are to be taken on regional level according selected measures. Measure 222 (Agroforestry) is not provided in any of RDPs analysed.

**Table 3**. Forestry measures based on Council Regulation (EC) No 1698/2005

| | Measure (CMEF-code) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Country/region** | **111** | **114** | **115** | **122** | **123** | **124** | **125** | **221** | **223** | **224** | **225** | **226** | **227** | **323** |
| *Bulgaria* | / | | | ☺ | ☺ | | | | ☺ | from 2009 | | ☺ | | |
| *Czech Republic* | * | ☺ | ☺ | ☺ | ☺ | / | ☺ | ☺ | | ☺ | ☺ | ☺ | ☺ | / |
| *Slovakia* | * | ☺ | | ☺ | ☺ | | / | ☺ | | ☺ | ☺ | ☺ | | |
| *Austria* | ☺ | | | ☺ | ☺ | ☺ | ☺ | ☺ | | ☺ | ☺ | ☺ | | ☺ |
| ***Germany*** | | | | | | | | | | | | | | |
| *NRW* | ☺ | ☺ | ☺ | | ☺ | / | ☺ | | | ☺ | | | ☺ | |
| *Saxonia* | | | | | | / | ☺ | ☺ | ☺ | | | | ☺ | |
| *Italy* | | | | | | | | | | | | | | |
| *Toscana* | ☺ | ☺ | | ☺ | ☺ | ☺ | ☺ | ☺ | ☺ | | | ☺ | ☺ | |
| *Veneto* | ☺ | ☺ | | ☺ | ☺ | ☺ | ☺ | ☺ | | | ☺ | ☺ | ☺ | ☺ |

*Notes*:

| | |
|---|---|
| | Measure will probably <u>not</u> be provided |
| ☺ | Measure will probably be provided |
| * | Foresters are target group but not applicants – for example measures concerning vocational training – the applicants are institutions which provide education for forest owners (so forest owners are here the target group, but alone they are not applicants for this measure) |
| / | Measure will be provided, but foresters are excluded |

It is possible that during current programming period there will be changes by providing or not providing mentioned measures (this is the reason, why in the description we talk of measure that will be "probably" provided). The reasons for this can be various: there may be a mistaken assumption that the offered measure will be requested by forests owners (for example in the Czech Republic in previous period 2004-2006 there was a measure support for forest owners' associations, but there was not any application for this measure) or there could be changes because of economic crisis.

The analysis of the RDPs from a forestry point of view shows that there are some forestry activities that were supported already in the previous planning period.

These are the traditional activities supported in measures 122, 123, 221, 226, 227 (silviculture activities, building of forest roads, fire protection, purchasing of machines, non-profit investments etc.) that were implemented also in the RDPs 2000-2006.

There is a new strong emphasis, on improving the competitiveness of the agricultural and forestry sector (Axis 1). In Axis 1 has been allocated the largest share of funds, despite the fact, that Community financial contribution to Axis 1 shall cover at least 10 % of the EAFRD total contribution to the programme (Council Regulation 1698/2005). The measures supporting training (111), investments to improve the economic value of forests (122), adding value to forestry products (123), and on developing forest infrastructure (125) existed also in the last period but are prioritized in this programming period. A number of new measures were defined by the EC which were partly taken up by the RDPs of the countries in our analysis. The cooperation for development of new products (124) has been included in Austrian and Italian RDPs,

measures of advisory services (114, 115) as an innovative tool for the improvement of the overall performance of forest holdings where included in the national RDPs of most countries.

Under the title of improving the environment and the countryside (Axis 2), the emphasis of forestry measures is put on first afforestation of agricultural land (221) and restoring forestry potential (226). Also the new measure on Natura 2000 payments (224) and the possibility for non-productive investments (227) are included in the majority of the analysed RDPs.

A horizontal objective and the measures under Axis 3 are not targeted to any specific sector. Nevertheless, some forestry-related actions could be financed under this axis, through the measure providing support for diversification into non-agricultural activities. For instance, the measure relating to conservation and upgrading of the rural heritage (323) will be implemented in RDP for Austria and Veneto also with forestry activities.

Forestry measures often have some interaction with measures from other axes too. Integration of operations from different axes can in some situation improve the overall effectiveness of rural development policy.

RDPs include also a financial plan. These plans give an overview about the priorities in the development strategy. The proportion of finances allocated to forestry measures according to indicative budgets in chosen RDPs 2007-2013 is presented in Table 4. The measure 111 (Vocational training and information actions, including diffusion of scientific knowledge and innovative practices for persons engaged in the agricultural, food and forestry sectors) and measure 323 (Conservation and upgrading of the rural heritage) are excluded, because of funding directed to forestry through these axis 1 and 3 measures can cover both agricultural and forestry sectors.

The Measure 114 represents in Czech Republic and in Slovakia amount of 24.7 resp. 24.5 mill. €. The expectation is that forest part will take about a quarter of this total amount. These are but a crude guess and therefore are these amounts in Table 4 and next figures not included.

**Table 4**. Sources allocated for RDP forestry measures for the period 2007-2013

| Country/region | Forest cover (%) | Forestry area (ha) | Budget 2007-2013 (million €) | Forest part | |
|---|---|---|---|---|---|
| | | | | million € | % |
| *Bulgaria*[1] | 37 | 4 070 000 | 4 278.4 | 335.0 | 7.83 |
| *Czech Republic*[2] | 34 | 2 647 416 | 4 605.3 | 261.6 | 5.67 |
| *Slovakia*[3] | 41 | 2 006 939 | 3 400.7 | 231.3 | 6.80 |
| *Austria*[4] | 47 | 3 960 000 | 10 707.0 | 417.1 | 3.90 |
| *Germany* | | | | | |
| *NRW* | 26 | 887 550 | 1 268.5 | 149.5 | 11.78 |
| *Saxony* | 28 | 511 578 | 2 233.1 | 76.2 | 3.41 |
| *Italy* | | | | | |
| *Toscana* | 50 | 1 151 539 | 1 333.1 | 238.1 | 17.86 |
| *Veneto* | 24 | 446 856 | 1 489.8 | 170.9 | 11.47 |

*Notes:*

[1] forest part without measure 224
[2] forest part without measures 114
[3] forest part without measure 114 and 123
[4] whole forest part from government information;

Figure 5 shows the anticipated expenditures in the selected states and regions on the implementation of the forestry measures during the years 2007-2013. The majority of the RDPs analysed have allocated more finances into measures in Axis I. But the description of forest part of measures in Axis 1 could be overestimated. By the measures, which are not specific for the forest sector, probably much of the money will be spent in supporting agricultural activities. In Italy have made an estimate that no more than 25% of the budget for measures 123, 124 and 125 will be used in the forest sector.

Only Slovakia and Saxony have more finances (in total amount: EU, national and private resources together) allocated in Axis II. But there are also differences in particular amount of resources for measures. For example, Slovakia has the highest expenditures in measure 226 (Restoring forestry potential and introducing prevention actions), whereas Saxony has highest expenditures in public expenditures for the measure 227 (Non-productive investments). In the Czech Republic more finances are allocated in Axis I, but when the private co-financing is taken off, than (from public expenditure point of view) the most financial means flows into Axis II.

The absolute amount of financial means flowing into forest sector is only basic information. For comparison, the share of Euro per hectare of forest land is more important (see Figure 6). There is a certain correlation (correlation coefficient 0,417) between forest cover and share of money allocated for forestry from whole RDP budget in each of investigated RDPs. For instance, in German and Italian regions the allocation of money in €/ha is higher than in the other countries of our analysis. Bulgaria, Czech Republic, Slovakia and Austria belong to countries with a high cover of forests (ca 40 %), but the allocated money is lower than in others (ca 100 €/ha). From the group of countries with forest cover below 30%, German regions plan support around 150 €/ha in comparison with Veneto´s with 350 €/ha.

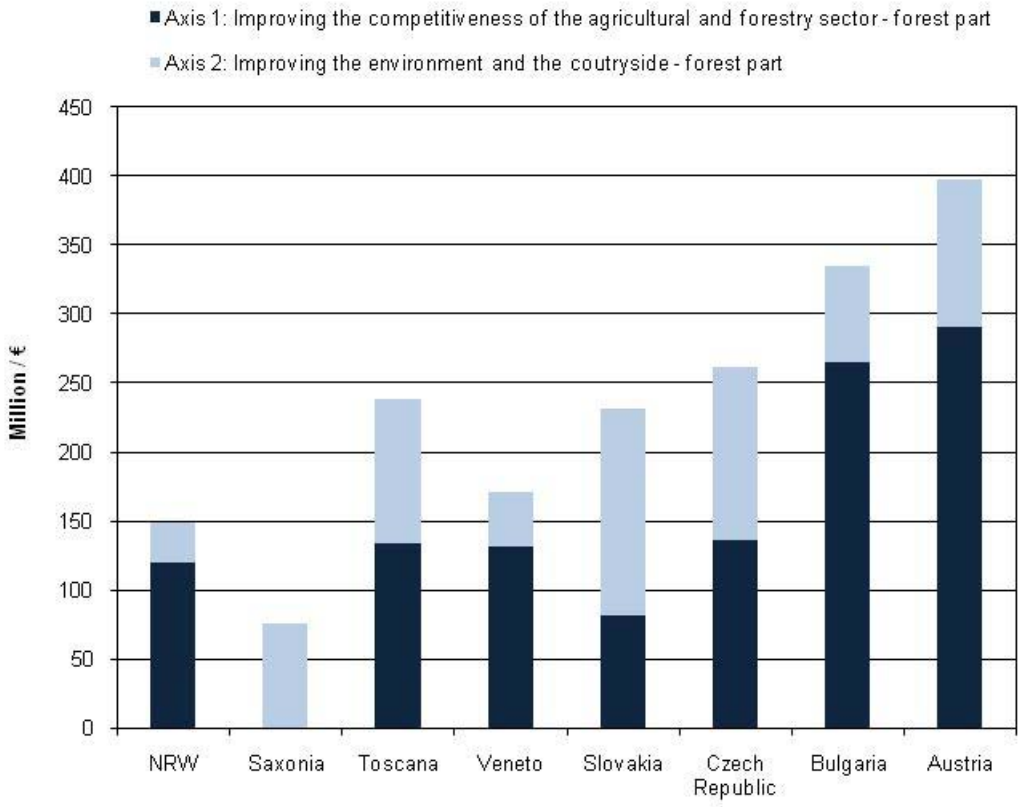


**Figure 5**. Allocation of financial means from RDPs, 2007-2013 (in million EUR)

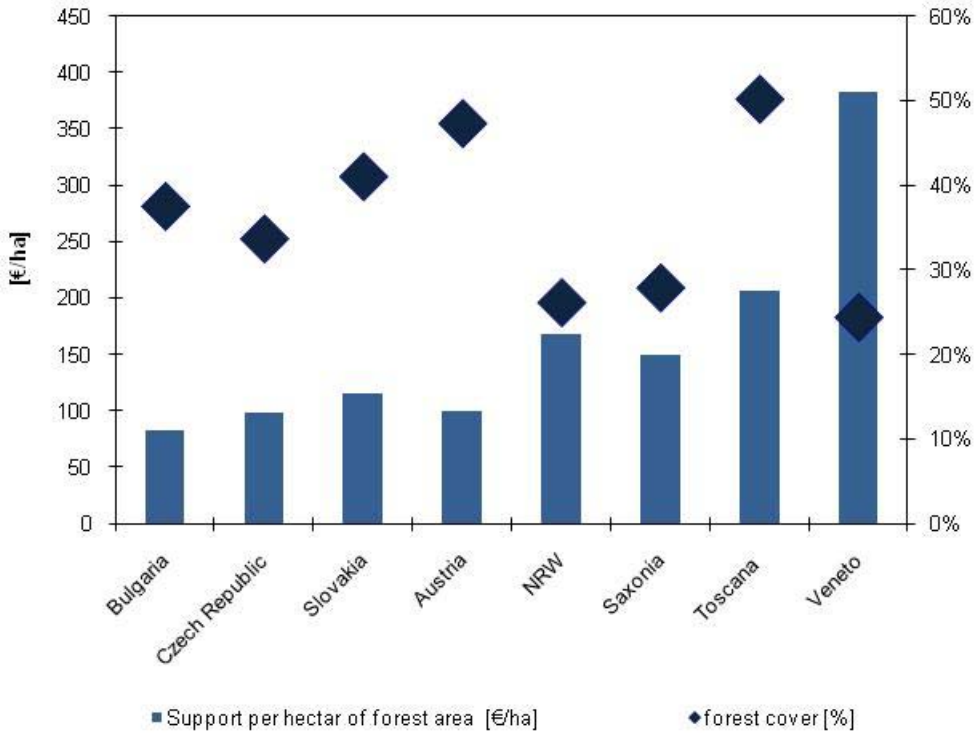


**Figure 6**. Support per hectare of forest area from RDPs 2007-2013 (in EUR/ha)

The amount of sources given to RDP depends mainly on the skill of each national (or regional) representative to negotiate with EU Commission, but the part allocated for forestry depends on priorities in national rural policy.

### *4.3. Examples of different interpretations of the measures*

In the following chapter, the differences in interpretation of a measure by the member states are shown.

#### *4.3.1. Measure 122: Improving the Economic Value of Forests*

According to the Council Regulation 1698/2005, the intention of measure 122 is the improving of the economic values of forests. It is implemented in ways that aim at:

- Improving and broadening their economic value,
- Increasing diversification of production and
- Opening of new market opportunities such as renewable energy,
- Maintaining sustainable management and respecting the multifunctional role of forests

The Austrian RDP supports many different kinds of measures from silviculture to investments in technical equipment plus the production of biomass. The main aim is to mobilize timber or biomass harvest, particularly from small private forest holdings. Professional training measures that should further support the effectiveness of the mobilisation activities are also included in this measure. The budget for this topic was significantly increased (around + 40%) which reflects the national forest policy priority of increased harvesting in order to supply the national industry.

Bulgaria focuses on silvicultural activities like thinning and lightening of forests. Furthermore, purchasing of harvesting equipment, such as motor saws, harvesters, and forwarders is supported.

Czech Republic aims at providing support for purchase of machines and equipment for the

construction and maintenance of forest roads, paths and pavements, soil amelioration, torrent control, retention reservoirs and facilities for tourism. The country also aims at improving the machinery and equipment serving regeneration and thinning of forest stands and primary processing of wood by environmental friendly technologies.

In Italy (Veneto), the actions for Measure 122 are for construction or maintenance of forest roads (Cost/benefit analysis is mandatory to demonstrate economic sustainability of investment). Another action relates to the conversion/amelioration of forest stands (with productive objectives). Veneto will also invest in sawmills.

Slovakia is also focussing on purchasing of equipment for regeneration of forest stands, thinning, cleaning, felling, and skidding. It also includes equipment such as motor saws, harvesters, forest cableways, hauling truck-and-trailers, and forwarder. Slovakia also intends to improve its forest roads and IT infrastructure (software and hardware). The third key activity in Slovakia's Measure 122 concerned investment in timber yards.

From these given examples, it is evident that Measure 122 is perceived very broadly, i.e. small activities – like thinning and lightening of forests could be subsidised, as well as very expensive actions – like purchasing of harvesters, forwarders and other machines. From this point of view, it is clear, that mostly the first three goals (improving and broadening economic value, increasing diversification of production and opening of new market opportunities such as renewable energy) are fulfilled in practice.

*4.3.2. Measure 123: Adding Value to Agricultural and Forestry Products*

Measure 123 assumes that value added can be increased through:

- Investment in the processing and marketing of existing products, and
- Investment in the development of new products, processes and technologies.

Eligible investments could be the construction, acquisition or improvement of immovable property, the purchase or lease-purchase of new machinery and equipment and general costs linked to expenditure such as patent rights and licences.

A closer look into the supported measures shows wide differences in interpretation.

Austria supports many measures for joint marketing systems, advanced logistics, and further processing of timber.

In Bulgaria, activities under this measure are focussed on enhancing the industrial processing. Eligible are e.g. costs for local saw mills or techniques for producing fire wood or pellets. In contrary to other European countries, in Bulgaria there are currently only two saw mills producing timber for export.

In the Czech Republic, the measure is realized with purchasing and improving of technologies for processing of biomass waste for energy purposes, construction or improvement of plants for forest products processing and purchasing of software and licenses. Applicants must be forest entrepreneurs with less than 10 employees or enterprises with a turnover under 2 Mil. €.

In Italy (Veneto) Measure 123 is realized in investing in new machinery for harvesting/transformation. Italy emphasises that beneficiaries must also adopt PEFC or FSC standards for forest harvesting activities/transformation.

In North Rhine-Westphalia Measure 123 is implemented via support for improving the processing and marketing of timber and timber products (processing costs, technologies, planning costs) and developing of new products, techniques and technologies in terms of forest products.

Eligible activities for Measure 123 in Slovakian RDP are construction, reconstruction and modernization of production buildings and halls; procurement, reconstruction and

modernization of machines and technology for primary processing of wood as a raw material. Support will be provided for:

- Activities prior to industrial processing of wood (additional primary wood production) and
- Processing of non-wood forestry products (e.g. equipment for drying woodland herbs, facilities for treating forest fruit after harvesting) and
- Processing and exploitation of renewable sources of energy, machinery and facilities for production of biomass.

These examples demonstrate that Measure 123 is also in all countries utilised in different ways. In some cases, support is focused on marketing opportunities, in other cases on improvement of technical equipment.

*4.3.3. Measure 226: Restoring forestry potential and introducing prevention actions*

Support under this measure is granted for restoring forestry potential in forests damaged by natural disasters and fire and for introducing appropriate prevention actions against fires only for medium and high fire risk forests. Many types of actions can be supported.

In Austria there is a focus on the restoration of mountainous protective forests which has been a focal area of national forest policy for many years. Measures include silvicultural and technical measures such as forest road construction (important aim) and preventive measures against natural hazards.

In Bulgaria, activities are mainly focusing on forest protection, e.g. against calamities by insects and for forest fire protection. The main prevention actions are purchasing of equipment for anti-fire depots, establishing and improving of water points as well establishing of fire breaks and the transformation of conifer stands into mixed stands.

In the Czech Republic, the support within measure 226 will allow reducing the extent of damage caused by natural disasters and fire. The support is further provided for the reconstruction of damaged forest stands, forest regeneration following salvage felling, preventive flood control measures on small watercourses and in their catchments areas, for erosion control measures and for the removal of damage caused by floods on small watercourses, in their catchments areas and on forest roads, remediation of gullies, erosion furrows, gully controls and stabilization of ravines on land designed to fulfil forest functions.

In the Slovakian RDP all activities complying with objectives of this measure, and all relevant EU regulations will be eligible:

- To implement projects dealing with remedy measures in forests damaged with biotic, abiotic and anthropogenic harmful factors
- Renewal of forest covers, protection, treatment and planting new forests in those damaged by biotic, abiotic and anthropogenic harmful factors
- Construction and reconstruction of forest roads within fire fighting and remedy measures; construction, reconstruction, repairs and maintenance of fire fighting reservoirs
- Building fire fighting zones and firebreaks, their maintenance and cleaning

The state forest could be also supported.

*4.3.4. Measure 227: Support for Non-Productive Investments*

According to the Council regulation 1698/2005, support is needed for non-remunerative investments:

- Which are necessary to achieve forest-environment commitments or
- Other environmental objectives or
- To enhance the public amenity value of the forest areas concerned.

The key activities with respect to Measure 227 in Czech Republic are activities to strengthen recreation functions of forest. The country also emphasized actions towards regulation of the number of forest visitors and on providing for their safety. Namely the construction, reconstruction and modernisation of roads

serving as footpaths up to width of two meters, cycle tracks for tourists, and objects to ensure the safety of the visitors (e.g. footbridges, railing, parking places, relaxing places, shelters, forest fountains, information boards etc.).

In Germany, all regions provide this measure with similar actions. The main focus is to support silvicultural activities like thinning and transformation of coniferous stands into mixed or deciduous stands. Furthermore, some counties support actions for some nature conservation actions with high costs (e.g. nature reserves). In North Rhine-Westphalia the key activities include silvicultural activities, e.g. in the form of thinning and lightening. As mentioned above, these activities are mostly supported in other countries with measures 122 or 123. In addition, North Rhine-Westphalia support is given for transformation of monocultures into mix stands and investment reforestation after natural disasters.

In Italy, Measure 227 is supported by investments for the improvement of touristic attractiveness of forest areas, such as information points, tracks and foot paths and botanic gardens.

The Measure 227 is very interesting because many different activities are understood under non-productive investments in forests. The most important is support for increase of tourism in forest areas (investments for cycle ways and other touristic equipments), but there are also activities which are “on the borders” between Axes I and II (thinning and lightening) or are more suitable for Measure 226.

## 5. Conclusions

The rural areas in Europe are characterised by significant diversity of their socio-economic situations and natural and cultural potentials. The countries differ greatly in terms of land use, however, no obvious relationships between the simple distribution of major land use categories and the implementation of rural development policy in the countries was found. It seems that differences in policies must rather be explained by social or political factors or complex relationships.

Our analysis shows how countries can differ in the priorities and objectives of their national or regional RDPs. Many countries or regions have clear priorities in their strategies designated by the size of the tentative budget for particular measure. For instance, Slovakia has clear priorities in its strategy to restore forestry potential, whereas NRW has prioritized forest-environmental activities in its rural policies.

The priorities, however, are not only expressed by budgets for different measures but also by different interpretations of the measures’ goals. The same forestry actions are often supported by different measures. For measure 122, which is actually focusing on improvement of the economic value of forests, different approaches were identified. In some countries the purchase of harvesting equipment and silvicultural activities are supported by this measure. In Germany, in contrast, the same silvicultural activities are supported under measure 227 (non productive investments). This shows a significant difference in the objectives for rural development in the countries, because measure 122 aims to improve the competitiveness of the forestry sector whereas measure 227 concentrates on the improvement of the landscape. In the German case, it seems that forests are not seen from a business perspective but rather as a natural resource with environmental aims. Czech Republic supports under measure 227 mainly activities for tourism, so the support is entire different in comparison to other countries.

That means that the national implementing institutions (mainly the ministries of agriculture or similar) have a stronger impact than the European institutions. This could be on one side seen as desirable when assuming that the national policy makers know best the national situation: they may act on the national situations in a better targeted way than an EU administration. On the other side, the national

policy representation can more easily be subjected to rent-seeking from powerful national interest groups. One example is the support for state forests: in some countries (e.g., in Germany) State forests are strictly excluded from EU support, in some they may be subsidized within Axis I (Czech Republic) and in some even within Axis II (e.g., in Slovakia state foresters can be supported as target group in training and advisory within Measures 111 and 114).

Concerning innovations there are similar results. The EU rural development policy recommends the support of innovation in forestry, but the true-life situation depends also on national political representation. Improvement of competitiveness seems to be high ranking in some member states (mostly new EU members), since it is strongly emphasized in their policies. Bulgaria, Czech Republic and Slovakia, for instance, stress in their political documents the importance of competitiveness and innovation in the context of strengthening their position in the EU economy. Innovation aspects (new technologies, knowledge, processes, and products) are included in RDP. It also appears that lack of information about actions that would support innovation and innovation transfer still exists among the applicants.

The framework is given: there are some small opportunities for supporting innovation within Axis II and large opportunities within Axis I. Especially Measures 122 and 123 are of high importance from this point of view. Measure 122, which is targeted on purchasing of various machines for forestry and relative branches, is realized in all countries and, for forest entrepreneurship, could be a significant motivational factor for the implementation of innovations. But in some countries (e.g. Czech Republic and Slovakia) this is limited by the “de minimis” rule, which means that a maximum amount is set for each applicant per measure and period, thus limiting the possible investments. For another innovation field, the diversification of forest products and services, Measure 123 seems most significant, but it is apparently utilised to different extents in the analysed countries/regions.

In Axis II the traditional forest measures like Restoring forestry potential and introducing prevention actions and afforestation of agricultural land are included. In such measures there are not many possibilities for innovation activities. The Measures 224 and part of 225 are new to the agricultural sector as such, but they are important mainly for improving of environment and countryside (from social point of view), not for private forest owners themselves. They help to finance positive externalities – like protection of forest Natura 2000 areas, but for the owners this is not a business opportunity as such – only vicariously for rural development, when landscape protection will bring new tourists.

Some additional opportunities for innovation are offered especially within Measure 227 (Non-productive investments) although they are not explicitly oriented at diversification. Building of new cycle-ways and other tourism infrastructure elements could be very important for rural development. Increasing of tourism attractiveness brings new innovation opportunities for rural entrepreneurs. Measure 227 is realized but only in three surveyed countries/regions.

Reasons for different strategies of implementing EU common rural development policy may lie in country profiles, strengths, weaknesses, opportunities or threats of the regions, political priorities, interests from powerful stakeholder groups, or in administrative traditions in RDP implementation. The primary reasons for these different approaches is planned to be identified by further analysis.

Regarding the vertical level of the coordination of rural development policy, the examples presented in the paper confirm that there is much leeway for member states in the use of the RD funds. The European Council in its regulations on rural development defines only

the political and economical framework for assertion of the rural development policy of the member states. In the analysed examples, the framework is the same, but the RDP measures are often utilized in different ways or are utilized in some countries more broadly than in others. The national/regional institutions – the main actors during the preparation and implementation phase of the RDPs – have strong impact on national or regional level priorities and objectives of the rural development policy.

On the horizontal level, rural development policy seems strongly coordinated with other EU policy areas. It reflects, for instance, the EU Lisbon Strategy for growth and jobs as well as the EU Sustainable Development Strategy. It thus supports competitiveness, innovation and diversification of the sector as well as the consideration of environmental protection and quality of life in rural areas. The explicit relationship with other policies is express in RDP. For instance, RDP should be in harmony with forest policy (represented by NFPs), sustainable development (National Strategies for Sustainable Development) and regional development (no overlapping between RDP and Regional Operational Programme). Rural development policy recommends the support of competitiveness, innovation and development hand in hand with environmental, animal welfare, social and cultural goals. One particular example for horizontal coordination (of rural and regional policies) can be seen of the use of the Leader approach in RDP. We have, however, also seen how strong national or regional sectoral interests may influence the policy implementation process and we therefore assume that powerful groups within the sector limit the coordination attempts between policies.

On the temporal level it can be observed that the new EU regulation on rural development makes the processes easier than before. The simplifications of rural development policy (one regulation, single funding system, choosing of measures) arise from previous programming period experience. The requested activities from previous implementation phase are fit to the measures proposed in the current phase.

**Acknowledgments**

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## 6. References

Bauer, A. and Rametsteiner,E. (2006) Policy Integration and Co-ordination: Theoretical, methodical and conceptual aspects. In: Ewald Rametsteiner (ed) Proceedings of the 1st COST Action E51 Joint MC and WG Meeting, 12-14 October 2006 Grosspetersdorf, pp. 49 – 66.

Cesaro, L., Sarvašová, Z., Setzer, F., Jarsky, V. and Weiss, G. (2008) Policy Integration: Different Strategies in Rural Development Programmes? In: Ewald Rametsteiner (ed) Proceedings of the 3rd COST Action E51 Joint MC and WG Meeting 17-18 December, 2007, Prague pp.100-115.

Common Agricultural Policy EU
http://ec.europa.eu/agriculture

Council Regulation (EC) No 1698/2005, OJL277, 21 October 2005
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:277:0001:0040:EN:PDF

Council Decision 2006/144/EC, OJ L 55, 25 February 2006
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32006D0144:EN:NOT

COST Action E51: Country reports AT, BG, CZ, DE, IT, SK
http://www.boku.ac.at/coste51/

DG Agri (2006) Handbook on Common Monitoring and Evaluation Framework
http://www.regione.piemonte.it/agri/psr2007_13/dwd/20_9_06/guidance/01guidance.doc

European Commission (2008):
Rural Development in the European Union – Statistical and Economic Information-Report 2008
http://ec.europa.eu/agriculture/agrista/rurdev2008/index_en.htm

EU Commission, Directorate General for Agriculture and Rural Development
http://ec.europa.eu/agriculture/index_en.htm

EU DG AGRI (2008) Rural development in the European Union, Statistical and economic information
http://ec.europa.eu/agriculture/agrista/rurdev2008/RD_Report_2008.pdf

FAO (1998) FAO Guidelines: Integrated coastal area management and agriculture, forestry and fisheries. Natural Resources Management and Environment Department, Rome
http://www.fao.org/docrep/w8440e/W8440e03.htm#TopOfPage

Giessen, L. (2008) Regional governance in rural development programmes – Which role for forestry? IUFRO European Congress 2007, Warsaw, IUFRO.

MCPFE (2000) The Role of Forests and Forestry in Rural Development – Implications for Forest Policy, Summary of Working Groups and Conclusions. International Seminar, International Forest Policy and Rural Development in Mountainous Regions
http://www.boku.ac.at/zib/ipInternational.htm

Report from the Commission to the Council and the European Parliament – The agricultural situation in the European Union – 2006
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0525:FIN:EN:HTML

Rural development policy
http://ec.EÚropa.EÚ/agriculture/rurdev/index_sk.htm

Rural Development Programme AT: Lebensministerium:
Österreichisches Programm für die Entwicklung des Ländlichen Raums 2007-2013
http://www.laendlicherraum.at/article/articleview/60503/1/21434/

Rural Development Programme BG 2007-2013:
National strategy plan for rural development (2007–2013)
http://www.eufunds.bg/?cat=62

http://www.mzgar.government.bg/mz_eng/RuralAreas/BG-RDP-2007-2013%20third%20official%20version-eng.doc

Rural Development Programme CZ:
Národní strategický plan rozvoje venkova České Republiky na období 2007–2013
http://www.mze.cz/attachments/NSP_SFC.pdf

Rural Development Programme IT:
Regione Veneto, Programma di Sviluppo Rurale 2007-2013
http://www.regione.veneto.it/Economia/Agricoltura+e+Foreste/Sviluppo+Rurale/
Programma di Sviluppo Rurale della Regione Veneto 2007-2013
http://www.regione.toscana.it/regione/multimedia/RT/documents/1214483500020_Versione_aggiornata_psr.pdf

Rural Development Programme D:
Nationaler Strategieplan der Bundesrepublik Deutschland für die Entwicklung ländlicher Räume 2007-2013: http://www.bmelv.de/cln_045/nn_751686/SharedDocs/downloads/08-

LaendlicheRaeume/Strategiepapier,templateId=raw,property=publicationFile.pdf/Strategiepapier.pdf, Das NRW-Programm “Ländlicher Raum" 2007 – 2013
http://www.murl.nrw.de/landwirtschaft/pdf/laendlicher_raum.pdf,Entwicklungsprogramm für den ländlichen Raum des Landes Sachsen-Anhalt (EPLR) im Förderzeitraum 2007 bis 2013
http://www.smul.sachsen.de/foerderung/238.htm

Rural development Programme SK:
Program rozvoja vidieka SR 2007-2013
http://www.land.gov.sk/sk/?navID=1&id=506

Sotte, F. (2003) An Evolutionary Approach to Rural Development. Some Lessons for Policymaker. Conference of the Slovenian Associations of Agricultural Economist. Ljubjana.

Standing Forestry Committee: First draft report on forestry measures in Rural Development Programmes (RDP) for the period 2007–2013, 17-18 December 2008, unpublished

The implementation of the cap and visions of its future role across 27 EU Member States
http://www.rlg.nl/cap/introduction.html

Chapter VI

# Policy Diffusion in the Forest-based Sector in Europe

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## 1. Forest-based sector technology platform – an instrument to support policy diffusion

In 2004 several European technology platforms were initiated by the European Commission to mobilize Europe's research, technological development and innovation efforts. The idea was to bring together industry, public authorities, academic and financial communities, consumers and users to define strategic research agendas for the medium to long-term development of the sectors concerned. The establishment of the platforms was from the beginning industry driven, aiming to establish effective public-private partnerships for implementation of the strategic research agendas for higher innovativeness and competitiveness of the European economy.

In 2004, the European Confederation of Woodworking Industries (CEI-Bois), the Confederation of European Forest Owners (CEPF) and the Confederation of European Paper Industries (CEPI) led a process to establish a technology platform also for the forest-based sector. This platform aimed to define and implement the forest-based sector's research and development roadmap for the future that would be supported by a wide range of stakeholders. The forest-based sector was defined to include all stakeholders with major interests in forestry, forest-based materials and products.[6]

[6] See http://www.forestplatform.org.

The forest-based sector technology platform as prepared in three phases: first a common vision to the future was build; second a strategic research agenda (SRA) to meet the vision was developed; and third the SRA is implemented through various means. The first phase was completed in February 2005 when the so called Vision 2030 was published. It emphasized the role that forest-based sector can play in a sustainable society in the future. The Vision 2030 states that the forest-based sector "*comprises a competitive, knowledge-based industry that fosters the extended use of renewable forest resources" and that the forest-based sector "strives to ensure its societal contribution in the context of a bio-based, customer-driven and globally competitive European economy*" (Forest-based sector technology platform, 2006).

The SRA that followed the Vision 2030 was published in February 2006. The SRA emphasizes issues such as sustainability, development and manufacturing of innovative products, forest and biomass resource availability, multiple uses of forests, biodiversity, production of bio-energy and energy efficiency. The SRA has five strategic objectives most important for this paper (the other four strategic objectives refer to capacity building and innovation systems and are left out from the paper), to:

1. Develop innovative products for changing markets and customer needs
2. Develop intelligent and efficient manufacturing processes, including reduced energy consumption

3. Enhance availability of forest biomass for products and energy
4. Meet the multifunctional demands on forest resources and their sustainable management
5. Study the forest-based sector in a social perspective

The forest-based sector technology platform's third phase, the implementation, started in 2006. An important element in the implementation was to build-up national research agendas (NRA) for forest-based sector development in different countries. They provide a strategy and a platform for national R&D funding to serve the same goal as the SRA: to increase the innovativeness and competitiveness of forest-based sector. By October 2008, 15 countries had published their NRA[7]. It appears that through forest-based technology platform EU has been able to improve policy diffusion among member states and to synchronize its own and national forest and forest industry policies for higher forest-based sector innovativeness in Europe.

## 2. Theoretical background and the main focus of the study

The methodical framework of the study is based on the theories about increasing similarity of national policies and the international spread of policy innovations from one political setting to another. These research subjects can analytically be grasped by the concepts of policy transfer, policy diffusion, and policy convergence. Whereas all of these concepts consider the aforementioned research subjects, they differ regarding their analytical level and focus (Knill, 2005; Holzinger et al. 2007):

- Policy transfer can be defined as "processes by which knowledge about policies, administrative arrangements, institutions and ideas in one political system (past or present) is used in the development of policies, administrative arrangements, institutions and ideas in another political system" (Dolowitz and Marsh, 2000, p. 5). It thus predominantly addresses policy processes rather than results and intensely scrutinizes concrete policy transfers with its causes, factors and individual characteristics and is therefore mostly located on a micro- or meso-level (Tews, 2002).
- Diffusion in general describes a "process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 1995, p. 5). On the policy level, this means that "diffusion research is motivated by the observation that nation-states, or some other jurisdictional unit, choose similar institutions within a fairly circumscribed period of time. Such behaviour results in temporal and spatial *clusters* of policy reform" (Elkins and Simmons, 2005, p. 34). Unlike policy transfer studies, policy diffusion studies therefore focus on the macro-level to scrutinize these temporal and spatial clusters of policy reform (Stone, 2001).
- Policy convergence, in contrast to the upper concepts, places emphasis not on the process of becoming more alike, but rather on the condition of being more alike. It is thus to be regarded a possible result of policy transfer or policy diffusion processes. This is, however, not necessarily the case, as policy convergence can as well be the result of other structural factors, e.g. similar conditions in various countries that produce similar problems which lead to similar policies without any direct link between the countries, while policy transfer and policy diffusion describe developments that are based on the intentional adoption of policies and communication between all parties concerned (Bennett, 1991; 1997).

For the present study, it seems appropriate to explore the development of forest and forest industry policies in the involved countries from a *policy diffusion perspective*, as it intends to examine the spreading process of policy innovations on a broader level, analyzing the national policy developments in six countries. So one research questions is, whether these countries recently did choose similar forest and forest industry policies and if a temporal

[7] See http://www.forestplatform.org.

and spatial cluster of forest and forest industry policy innovations is consequently observable in Europe.

Subsequently, if such a development has been discovered, a second research question has to be why such a diffusion process has taken place in the sector of forest and forest industry policy in Europe. According to Holzinger et al. (2007) four causal mechanisms of policy diffusion can be differentiated:[8]

- Diffusion by *imposition* describes the forced policy adoption by a country (e.g. after a war)
- Diffusion by *international harmonization* describes the compliance of involved countries with uniform legal obligations defined in international or supranational law.
- Diffusion by *regulatory competition* describes the mutual policy adjustment of countries facing competitive pressure, which implies economic integration among the countries.
- Diffusion by *transnational communication* is an umbrella term for a number of various related causal mechanisms that are, unlike the aforementioned causal mechanisms, *exclusively* based on communication among countries:
    - *Lesson-drawing* refers to the rational utilization of made experience in other countries in order to deal with domestic problems.
    - *Transnational problem-solving* describes the joint development of common solutions to similar domestic problems and their subsequent adoption by nation states driven by élite networks or "epistemic communities" (Haas, 1992).
    - *Emulation* of policies is driven by the mere desire for conformity with other countries, that does not require a similar problem perception, instead of by oneself searching for solutions to given problems.
    - *International policy promotion* generates legitimacy pressure that can lead to the adoption of certain policies which does not (merely) on a desire for conformity of the adopting state.

Not all of the causal mechanisms depicted here come into question in the context of this study. The mechanism of imposition is clearly irrelevant in this regard. The same holds true for the mechanism of international harmonization because even though the EU or other international institutions are engaged in forest or forest industry policy, however, there is no binding international or supranational law that would obligate the countries concerned in this study to adopt similar policies in this sector. As a consequence, we focus on *regulatory competition and transnational communication* as causal mechanisms for policy diffusion in this study.

## 3. Material and methods

The analysis of policy diffusion was based on the comparison the European level forest-based sector Vision 2030 and the related SRA with the content of national forestry and forest industry policies. The analysis of national forest and forest industry policies was based on the comparison of trends, threats, opportunities and measures of action in six European countries: Finland, Sweden, Norway, Austria, Poland and Romania (Annex 4). These countries participated in European Science Foundation supported COST Action E51, which provided a platform for joint meetings and discussions for the study.

In order to secure construct validity in the document analysis, a set of standard questions was used for all countries including key words to be followed in the document analyses: future, vision, strategy, objective. Furthermore, to obtain a similar view of the document and subsequent analysis, discussions prior to the analysis of what to search for were made. At the end, a second round of analysis where a summary of all individual analyses was included, was sent to the authors to obtain consistency.

[8] Holzinger et al. refer these causal mechanisms to policy convergence. However, as they also mention (see Holzinger et al. 2007, p. 29), the four causal mechanisms mentioned here also hold true for policy diffusion processes as policy convergence and policy diffusion (as well as policy transfer) are not mutually exclusive concepts and rely largely on the same causal mechanisms.

The content of the forest-based sector technology platform Vision 2030 and the related strategic objectives were found at:

- http://www.forestplatform.org/easydata/customers/ftp/files/pdf/SRA_FTP_Final.pdf
- http://www.forestplatform.org/easydata/customers/ftp/files/pdf/FTP_Vision_Document_2030.pdf

The national forest and forest industry policies were available in various official publications, programs and documents. The used national forest and forest industry policy materials include:

- *Finland*: National Forest Programme (2015), Research Strategy of the Finnish Forest Sector Cluster (2006), Suomen puutuoteteollisuus 2020 – Skenaario- ja strategiatyön loppuraportti (2006), (Finnish wood cluster 2020 – Final report of the scenario strategy (2006)), The wood product cluster's research strategy (2008), Valtioneuvoston kanslia (2008) (Prime minister's office (2008));
- *Sweden*: The Forestry Act, Evaluation and status of Swedish forest policy (2003/04), Governmental committee (2004-2006) of the Swedish Forest Law (2006), The Forest Industry – A Part of Innovative Sweden (2005), The Swedish National Research Agenda;
- *Norway*: White Paper (1998-99), Forest Resources in Norway (2006), National Research Agenda (2007);
- *Austria*: Österreichisches Waldprogramm (The Austrian Forest Programme), Nationale Forschungsagenda für den waldbasierten Sektor in Österreich;
- *Poland*: Polityka Leśna Państwa (National Forest Policy, 1997), Polityka Ekologiczna Państwa 2006 (National Policy of Ecology, 2006) and Polityka Leśna Państwa i Narodowy Program Leśny (National Forest Policy and National Forest Programme, 2005);
- *Romania*: National Forest Strategy (2001), National Forest Programme (2005), Romanian Government (2004; 2005a; 2005b; 2005c; and 2008).

# 4. National forest and forest industry policies in the context of Forest-Based Sector Technology Platform Strategic Research Agenda

## *4.1. Finland*

*Forest policy*

The content of the Finnish National Forest Program (FNFP) 2015 (Finnish Ministry of Agriculture and Forestry, 2008) reflects well the strategic objectives of the forest-based sector technology platform of the EU. However, there are more issues in the FNFP 2015 than in the forest-based sector technology platform SRA, which basically emphasizes only the availability of forest biomass, multifunctionality of forests and the social perspective of the forest-based sector (SRA objectives 3-5). The FNFP 2015 includes for example the following issues that are less emphasized or not visible in the SRA: availability of work force in forestry; need for a better maintenance of roads, railroads and water courses; entrepreneurship in forestry; cultural values of forests; education and the co-operation between national and international forest and development policies.

*Forest industry policy*

The two main emphases of forest and forest industry policies, i.e. firstly the increased wood harvestings from private forests and secondly the R&D investments for higher efficiency of current production and for new products for new forest-based businesses, are well in line with the objectives 1, 2 and 3 of the European SRA. The objective 4 on meeting the multifunctional demands on forest resources and their sustainable management is well focused in the FNFP 2015 but it is less visible in the forest industry policy documents. The objective 5 on studying the forest-based sector in a social perspective is weakly emphasized in the forest industry policy documents.

In Finland, the national forest industry policies match well with the objectives of the forest-based sector technology platform Vision 2030 and the related strategic objectives. Especially the forest industry-based national research agenda (NRA) (Finnish Forest Industries Federation, 2006) that emphasizes the opportunities of sustainable development for the forest-based sector, the efficiency improvements of current production and the development of new products for new forest-based businesses is very similar to the forest-based sector technology platform strategic research agenda (SRA). This may be due to the preparation of the SRA at the same time when the NRA was discussed in Finland. Also the high participation of Finnish organizations in the preparation of the SRA may have improved the integration of the Finnish NRA close to the SRA of the EU.

### *4.2. Sweden*

*Forest policy*

Swedish governmental forest policy is based on a consensus for the sustainable management of the Swedish forest resources. The policy emphasizes the multifunctional demands and uses of the forests under a sustainable manner, as well as supports the need for increased production meeting the demands for wood-based products and increasingly energy. With this respect, the forest policy is in line with the 3rd and 4th objective of the SRA. There are though more detailed and country-specific targets and measures in the forest policy compared with the European-wide SRA. Related to the 5th objective of the SRA, the forest policy emphasizes that forests should be open for other values and goods like hunting, recreation and tourism. The forest policy also acknowledges that the Swedish society is affected in many ways by the forests per se and that the forest sector benefits the national economy in terms of employment, rural communities, complementary sectors etc.

*Forest industry policy*

The Swedish forest industry policy as defined by the forest-based industries in the Swedish NRA and Sector-based Research Program, is much in line with the five objectives of the SRA. The Swedish NRA (Swedish Forest Industries Federation, 2006) and the Sector-based Research Program document (Ministry of Enterprise, Energy and Communications, 2005) post similar challenges and threats as outlined in the SRA, and suggest similar measures as the SRA. The difference in measures are found in that the background document to the Sector-based Research Program has a higher focus on cooperation and collaboration between actors in the innovation system (industry – society – academia) compared with the SRA. Furthermore, there is a slightly higher focus on the primary industry than the wood manufacturing industry as is the case for SRA.

The Swedish NRA focuses on the mechanical wood, pulp and paper industry as well as the society as a whole, which comes from the importance of these areas for Sweden. But the similarity is the direction of emphasizes towards innovative products, processes and services utilizing the inherent knowledge level in Sweden. Overall, the high participation of Swedish organization and company representatives in the preparation of SRA could have had an effect on the direction of the SRA but more so on the NRA.

### *4.3. Norway*

*Forest policy*

The White Paper for forest policy (Norwegian Ministry for Agriculture and Food, 1999) was prepared nearly one decade ago. However, several issues put forward in the Vision 2030 of the European SRA can be found in the forest policy document from 1999. This is visible especially in the White Paper related five-year research program aiming

at developing new products from forest resources, which objective fits directly to the 1st objective of the SRA. In the White Paper there were some thoughts of energy intensive industries but no further strategies were put forward. Related to 2nd objective of the SRA, there were no concrete actions defined in the White Paper. No special actions were introduced neither to meet future demand of timber (3rd objective of the SRA). This may be linked to the fact that former forest policy documents had heavily focused on this issue, and at 1999 the timber supply in Norway was not a major issue in forestry. On the other hand, the forest policy document from 1999 was the first to deal with environmental issues (4th objective of the SRA). Multifunctional demands and their sustainable management were also highly focused in this document. The social perspective (5th objective of the SRA) was very much linked to regional issues though bottom-up strategies. Local value added linked to nature based tourism utilizing forest resources was also emphasized.

*Forest industry policy*

The annual growth of timber was measured to be higher than the annual harvesting and in 2005 the government in Norway collectively stated that the forest sector should be strengthened with the help of this under-utilised resource. A consequent report was conducted in 2006 by the government-affiliated Norwegian Forest and Landscape Institute (Norwegian Forest and Landscape Institute 2006), which focuses on how to increase wood harvesting in Norway. The vision from the politicians was to increase annual cutting from 8 mill $m^3$ to 14 mill $m^3$ already in the short run. Several measures were introduced to meet this goal. On the supply side these included tax realizes for the forest owners. On the demand side actions to support innovations, research and development were introduced.

A new stage in the forest industry policy developed at the end of 2007, when a National Research Agenda was introduced through an industry-led process in Norway (Norwegian National Support Group of the Forest-based Sector Technology Platform 2007). With the following 10 research areas put forward, this NRA can be seen as perfectly designed to fit with the SRA objectives 1-5:[9]

1. Tailor-made wood supply
2. Commercializing soft forest values
3. Building with wood
4. Living with wood
5. New technology for primary processing of wood
6. New technology for production of wood products
7. Fibre-based packaging with tailor-made functionality
8. New cost-effective and innovative printing paper grades
9. New biobased materials and chemicals based on biomass from the forest
10. Bioenergy from forest-based biomass

### *4.4. Poland*

The Polish National Research Agenda is currently under preparation. Therefore the FTP Vision 2030 and SRA were compared only with the already existing documents (NFP and NPE) and with the analysis of Polish forest based-sector in global market (Mederski et al. 2008).

*Forest policy*

The public National Forest Policy and National Forest Programme can be seen currently as documents suggesting directions for the future development of the forest sector. The forest-based sector (understood as industry processing of wood, e.g. furniture and paper industry) is not, however, very well described in the above mentioned policy documents. As the forest-based sector is private, it possibly has an own strategy, which is not revealed so openly as the public policy documents.

As regards Vision 2030, this is only partially reflected in the forest policy of Poland. The

[9] *Source*: http://www.treforsk.no/uploads/NRAEngelsk(1).pdf and http://www.treforsk.no/uploads/NRAEngelsklang.pdf.

key role of the forest sector in the society as presented in the forest policies is to achieve higher availability of forests for everyday use (health and recreation) and education. These benefits will increase along with the forest cover enlargement, as do the carbon accumulation and sequestration. Environmental and social reasons can be seen as reasoning for afforestation, wood production growth and changes in species composition.

To keep Polish forestry competitive is a major aim in current and future forest policies. At the moment forestry is economically effective and not subsidized, which is very important as 80% of the forests are state owned and any ineffective or subsidised means would become expensive to the country. The strategic planning in Polish forestry is quite similar to parts of the SRA: the Forest Based Value Chain "Forestry" and Strategic Objective 3. Enhancing availability and the use of forest biomass.

*Forest industry policy*

Forest industry policy aims – as the Vision 2030 – to support the competitiveness of forest-based industries. As 2008, the competitiveness of furniture and paper industry was already rather good. However, the paper industry in particular should still improve productivity to lower the paper trade deficit or even better – to achieve a paper trade surplus. One particular threat is that Polish industry uses coal as the main energy source, which makes all industry less competitive in terms of environmental issues than in many other countries. However, environmental protection is already a very important issue in the strategy of forestry and forest-based sector.

The Polish wood products industry is perhaps closest to the aims of the SRA to be competitive and knowledge-based production sector. In other forest-based value chains Poland has limited capacities in active participation to EU co-operation, as their technologies are usually "borrowed" from different countries in the form of international investments. It seems like this will appear as a key point in the coming Polish NRA – to achieve active participation for the development of own technologies.

### *4.5. Austria*

*Forest policy*

The connections between the Austrian NFP (Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management, 2007) and the FTP Vision 2030 were rather weak. This is mostly due to the reason that the creation of the Austrian NFP was started in 2003 and finalized only in 2005. Instead of Vision 2030 documents, the NFP has more in common with the European Forest Strategy 1999.

The Austrian forest sector has been known for its corporatist policy networks and 'clientelistic' behaviour. The new NFP aims at making a clear distinction to the earlier tradition and focuses on creating transparent policies and incorporating different stakeholders with the policy process. The narrow concentration on the forest owner is widened to take into consideration also the forest industries, environmental areas and educational needs. The highlights of the Austrian NFP are placed especially on the wood supply, game management and the environmental issues (hazards, avalanches) as well as on societal needs.

*Forest industry policy*

The industry-based Austrian NRA (National Support Group Austria of the Forest-Based Sector Technology Platform, 2008) was completed at the end of May 2008. Before that, Austria had no official forest-based industry policy guidelines although some of the points were covered in the NFP.

Built in line with Vision 2030 and forest-based sector technology platform, the content of the NRA meets many of the objectives set in the SRA. Some special country attributes can still be found. Pulp and paper markets are especially regarded keeping the environmental

reasons in mind. Many of the objectives concentrate on the sustainable development and cost efficiency issues, and there is a strong emphasis on bio-energy and wood products. A strong focus is placed on composites, energy issues and recyclable products. Another speciality presented in the document, is the need to enhance and improve cooperation and communications.

Differences also exist in ways how objectives are allocated. Some of the separate SRA points are bundled together in the Austrian NRA. Even when the supply chain isn't mentioned in the specialities' fields of the NRA, it has a high importance through the whole NRA document. The NRA specialty field is highly concentrated both on product and process innovation (such as in composites and bio-energy products). Many of the topics elaborate issues such as recycling, composites and raw material optimisation.

The NFP focuses on the questions of the wood supply and communication. Therefore, it appears that these two documents create a complementary guideline for both the forestry and forest-based sectors.

### *4.6. Romania*

*Forest policy*

The governmental National Forest Programme (Romanian Ministry of Agriculture and Rural Development, 2005a) and the National Forest Strategy (Romanian Ministry of Agriculture and Rural Development, 2005b) were elaborated with no connection to the Vision 2030 or SRA simply because the national documents were prepared one year before the FTP documents. Compared with the EU Vision 2030, the Romanian public policy documents were built in a rather static perspective about the future since they focus on the preservation of the forests and the increase of the forest area, and not on the challenges of the 21st century. The implicit assumption behind the national policies was that the society needs forests for their ecological functions, mostly. However, the forest policy documents are partly on line with the objective 1 and 4 of the SRA, regarding the evaluation of forest products and services other than timber, and regarding the advancing knowledge on forest ecosystem.

*Forest industry policy*

Because there is no specific industry-based policy document regarding the forest industry policy, one may compare only the policy on the furniture industry, expressed in the Romanian Industrial Policy and in the National Strategy for Export. Similarities between the SRA and the more general industry policy documents appear regarding the objective 2 and 3:

- The need of securing the availability of wood supply;
- The new manufacturing technologies for furniture products;
- Harmonisation of timber flow to provide the needed quality of timber (tailor-made supply). The National Strategy for Export promotes the idea of agreements between the main stakeholders of the forest sector for the best utilisation of timber resources.

For the other sectors of timber industry, the provision of policy documents studied is mostly on line with the EU policies, e.g. Lisbon strategy. The documents focus on increasing competitiveness, development of the human resource, decreasing the bureaucratic burden on private businesses, developing more value-added products and using more of green technologies. Following the Romanian integration in the EU, the documents on industrial policy practically transposed the EU terms and vision on industrial development, research, innovation and entrepreneurship into national context.

## 5. Discussion and conclusions

According to the analyses of forest and forest industry policy documents in Finland, Sweden, Norway and Austria (see Annex 4), it is evident that one of the major concerns in forest industries in these countries is the declining international competitiveness. Outsourcing, investments overseas and production reductions in traditional forest

industries (like pulp and paper) are expected to continue in the future. This development has already led into R&D investments on new wood-based products and businesses, but also on efforts to increase efficiency in the industrial processes and the use of energy, material and labour. Particularly in Finland and Sweden, public-private partnerships are encouraged to coordinate the R&D efforts and increase the supply of capital for investments to new business innovations. In Poland the aim is to increase forest industry production with the help of technology imports and investments on modern production facilities. In Romania, separate forest industry policies do not exist and the forest industry development emphasize is more in technology imports than in innovations.

Second visible element in the forest and forest industry policy documents (and more visible in Finland, Sweden, Norway and Austria than in Poland or Romania) is a trust on the positive role of sustainable development, which is believed to strengthen the competitiveness of forest-based industries in the long run as the demands for renewable materials increases. This is one of the major reasons behind the view in the policy documents that wood mobility will be a major challenge for forest-based sector development in the future. To satisfy the increasing demand for wood, especially the non-industrial private forest owners, who have less interest on forestry or forestry income than earlier, should be activated for forest management, e.g. silviculture and timber sales. Despite common aims, it is logical that there are different routes taken by the countries to achieve increased production, from direct measures like tax reductions to indirect measures of information and consultation. The route taken is much dependent on the tradition in the countries with Sweden opting for consensus decisions and Austria historically for top-down decision-making.

Forest and forest industry policies in Poland emphasize afforestation as a mean to increase wood supply in the long run when more wood is needed for example for the environmental and social purposes but also for growing pulp and paper production. In Finland, a major threat is that Russia is likely to raise the export duties of timber, which will cause a major deficit of fibre for forest industries. To compensate the declining timber imports from Russia, measures like temporary tax reduction for timber sales income have already been decided by the government.

A third common element in the forest policy documents is a strong emphasize on environmental issues. Biodiversity conservation, water protection and retention, and mitigation and adaptation to climate change are clearly included in the forest policy documents of all study countries.

Fourth similarity in the forest policy documents is that they emphasize the varying social demands on forests and forest uses. Forests appear a source for multiple products and services including wood, energy, recreation, amenity, conservation, etc. The environmental and climate arguments have increased during the past decade and increasingly been seen as a source of competitive advantage for forest industry. Therefore, the link between forest policy and forest industry policy is evident – long-term sustainable management of the forest resource supports a strong forest industry. From this and as forests can satisfy multiple environmental and social demands, co-operation, public dialogue and participation are seen important in deciding on how the forests are used. In Sweden, for example, the national forest policy formulation that is based on wide participation of different stakeholders has led into a consensus driven process where the role of forest owners in decision making has grown strong. The public dialogue and participation in forest policy formulation is clearly different in forest industry policies, where it appears that participation in policy formulation process and decision making is of less an issue.

Fifth common element in forest and forest industry policies is that forests provide opportunities for several and new to current forest industry businesses. The evolving business opportunities include bio-energy, tourism, carbon sequestration, water and

amenity services, and like in the case of Sweden and Poland, also hunting. Many of these new business opportunities do not yet exist or they are small in size compared to timber-based businesses. Forest policy aims at long-term sustainable development with multiple uses of forests, and exemplifies different areas of usage more than proposes business opportunities. Forest industry policy has a clearer business perspective but is dependent on a sustainable forest resource, including its volume. Bio-energy is an example which is seen as a promising new business area both in forest and forest industry policies. The new and even not yet existing business opportunities are more emphasized in the forest and forest industry policies of Finland, Sweden, Norway and Austria than those of Poland or Romania.

Interestingly, the available forest and forest industry policy documents from Poland and Romania suggests that in these countries much attention is paid on the development of traditional forest industries, increasing forest area through afforestation and organization of private forestry. For comparison, renewing current forest industry production is more emphasized in Finland, Sweden, Norway and Austria. Similarities between the forest policies between all of the study countries include attention on wood mobilization, environmental issues and recognition of social demands on forests. The role and view of the forest resource has developed from being a supplier of raw material to the traditional forest industry to that of supplying multiple values, e.g. mitigate climate change, preserve wildlife habitats, improve water, enrich people with wilderness, renewable energy etc.

When the content of forest and forest industry policies in the six study countries were compared with the European level forest-based sector Vision 2030 and the related strategic research agenda (SRA) the conclusion was evident: The five key objectives of the SRA, including the development of innovative products, increasing the efficiency of industrial processes, securing the availability of raw material for industries, satisfying multiple demands on forests and fulfilling the many social needs on forests, are all well represented in the national forest or forest industry policies in Finland, Sweden, Norway and Austria and to some extent also in Poland and Romania.

Especially the contents of NRAs, if such agendas existed, and the SRA, were very similar. In Poland for example, where the NRA was still under development, the closest link between national forest and forest industry policies was in Strategic Objective 3, securing the availability of raw material. In Romania, forest industry policy did not exist, but the common industrial policy followed European visions on industrial development, innovation and entrepreneurship.

In the case on national forest policies and the SRA, the possible differences in the content and emphasize may be due to the time when the national policies were formulated. In the case of Austria, for example, the national forest policy had been written before the SRA was agreed, and thus their matching was less visible. The national forest policies differed from the SRA objectives also due to differences in national conditions both geographic and climate, the traditions in decision-making and public-private relationships and the importance of forestry and forest industries in the national economy.

From a theoretical point of view, it is reasonable to conclude that *policy diffusion*, as defined in chapter 2, between different countries in the EU has happened. In the words of Elkins and Simmons, the adoption of fairly similar NRAs over a relatively short period in some European countries, that has been analyzed in this study, can be coined a “temporal and spatial clusters of policy reform” (2005, p. 34).

However, it is less clear why the forest and forest industry policies of individual countries match so well with the European level policies. Obviously *transnational communication*, according to which the spread of policy innovations is based on a number of various related causal mechanisms that are based on

communication among countries could have been a reason for the diffusion of forest industry policies between the case study countries and the FTP.

Following the concept of policy diffusion based on transnational communication, which is based on Holzinger et al. (2007) and was presented in chapter 2, a potential explanation for the diffusion process can be derived from the concept of *international policy promotion*, since forest industries have already become a global system with changes in one area having direct effects on related areas or sub-industries. Although forest industry policies have still a clearly identifiable country focus, these policies have to be adapted to changes in the large international systems where forest industries operate. Policy-makers in different countries are most likely aware of the need to change and develop national forest industry policies according to changes in international and even global markets and policy processes. Thus, states, inter- or supranational actors can effectively promote certain policies in this sector, like it was done by the Forest-Based Sector Technology Platform by setting up the Vision 2030 and the related SRA.

In practice, the diffusion process of forest industry policies is possibly due to a large number of the same participants acting both nationally and internationally, thus having high possibilities for cooperation, coordination and integration leading to knowledge transfer and comparable problem perceptions. These are decisive prerequisites for the communicative diffusion mechanisms of *lesson-drawing* and *transnational problem-solving*. The *élite networks* or epistemic communities (Haas, 1992) in the field of European forest policy and forest industry are conducive to learning processes, because participants can benefit from experiences with similar problems made in other countries, as well as to joint problem-solving activities that lead to similar national policies.

Another practical reason for a rational policy transfer process could be the risk of isolation if national policies were planned different from the EU policies. This generates legitimacy pressure on member countries that leads to the *emulation* of prevailing policy designs in this sector and consequently fosters the diffusion of these policies.

The diffusion of forest and forest industry policies observed in the present study in Europe doesn't need to stem only from "soft" mechanisms of transnational communication alone like emulation because of the desire of conformity. There are also "hard" mechanisms like the *regulatory competition* between the countries that foster this development. Bearing in mind the advanced economic integration of EU member states, it is important for national governments to provide industry and business facing competitive pressure with a supportive general legal and political framework, which is adjusted to the surrounding international or regional conditions. For example, if a NRA was very different from the SRA of the FTP, the national development efforts would be off the main stream of development, having less potential for financial support and international co-operation. Thus, also for practical reasons, the NRAs are most likely to follow the already agreed guidelines of the SRA.

While all of the aspects of the causal mechanisms of *transnational communication* and *regulatory competition* are likely to have played a role in this case of policy diffusion, these conclusions do not leave much space for an explanation that similar but independent problem-solving could have been alone a reason for policy diffusion. If similar but independent problem-solving was a single reason for policy diffusion, then similar forest and forest industry policy developments would have taken place in different countries rather simultaneously but without clear direct link in between them. While the simultaneousness is a fact, the missing link between the countries is less evident as countries in EU context co-operate and work together regularly. This holds true not only for the forest policy and forest industry sector and makes it "difficult to imagine an area of policy where, policy makers seeking solutions, would be unaware of choices made elsewhere" (Weibust, 2005, p. 47).

## 6. References

Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (2007) The Austrian Forest Programme. Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management, Vienna.
http://www.walddialog.at/filemanager/download/19347/%C3%96sterreichisches%20Waldprogramm

Bennett, C.J. (1991) Review article: What is policy convergence and what causes it? British Journal of Political Science, 21, 215-233

Bennett, C.J. (1997) Understanding Ripple Effects: The Cross-National Adoption of Policy Instruments for Bureaucratic Accountability. Governance: An International Journal of Policy and Administration, 10, 213-233

Dolowitz, D.P. and Marsh, D. (2000) Learning from Abroad: The Role of Policy Transfer in Contemporary Policy-Making. Governance: An International Journal of Policy and Administration, 13, 5-24

Elkins, Z. and Simmons, B.A. (2005) On Waves, Clusters, and Diffusion: A Conceptual Framework. The ANNALS of the American Academy of Political and Social Science, 598, 33-51

Evaluation and status of Swedish forest policy 2003/04, Skr 2003/04:39, 2004.
Ministry of Enterprise, Energy and Communications, Stockholm.
http://www.regeringen.se/sb/d/108/a/14305

The Forest Industry – A Part of Innovative Sweden. 2005.
Ministry of Enterprise, Energy and Communications, Stockholm.
http://www.regeringen.se/publ

Norwegian Forest and Landscape Institute (2006) Forest Resources in Norway – Strategies to increase forest activities in Norway. Viten fra Skog og landskap 03/2006
http://www.skogoglandskap.no/publikasjon/SF_3945_3478

Governmental committee (2004-2006) of the Swedish Forest Law (Skogsutredningen), 2006.
Ministry of Enterprise, Energy and Communications. Stockholm.
http://www.regeringen.se/sb/d/108/a/70149

Government Programme 2005-2008 (Programul de guvernare 2005-2008),
http://x.gov.ro/obiective/pg2005-2008/program-de-guvernare.pdf, December 2004

Haas, P.M. (1992) Introduction: Epistemic Communities and International Policy Coordination. International Organization, 46, 1-35

Hogl K. and Kvarda, E. (2007) Main Assessment Report on the case study: The Austrian Forest Dialogue. EU FP6 Research Project GoFOR: New Modes of Governance for Sustainable Forestry in Europe. BOKU. Austria

Holzinger, K., Jörgens, H. and Knill, C. (2007) Transfer, Diffusion und Konvergenz: Konzepte und Kausalmechanismen. In: Holzinger, K., Jörgens, H. and Knill, C. (eds.). Transfer, Diffusion und Konvergenz von Politiken. PVS Sonderheft 38. Wiesbaden: VS Verlag für Sozialwissenschaften: 11-35

Knill, C. (2005) Introduction: Cross-national policy convergence: concepts, approaches and explanatory factors. Journal of European Public Policy, 12, 764-774

Mederski, P.S., Bembenek, M. and Karaszewski, Z. (2008) Oddziaływanie globalizacji na sektor leśno – drzewny w Polsce (The impact of globalisation on the forest-based sector in Poland). SITLiD, Warszawa, pp. 65-77.

Ministry of Agriculture and Rural Development, 2001, up-dated 2005. National Forest Strategy (Politica si strategia de dezvoltare a sectorului forestier din Romania (2001-2010) / Policy and strategy of forest sector development in Romania (2001-2010)
http://www.maap.ro/pages/page.php?self=02&sub=0202&tz=020201&lang=2

Romanian Ministry of Agriculture and Rural Development (2005a) National Forest Programme (Programul Forestier National, 2005)
http://www.maap.ro/pages/page.php?self=02&sub=0202&tz=020202&lang=2

Romanian Ministry of Agriculture and Rural Development (2005b) National Forest Strategy. Revised version. (Politica si strategia de dezvoltare a sectorului forestier din Romania (2001-2010) / Policy and strategy of forest sector development in Romania (2001-2010)).
http://www.maap.ro/pages/page.php?self=02&sub=0202&tz=020201&lang=2

Finnish Ministry of Agriculture and Forestry (2008) National Forest Programme 2015 – More Welfare from Diverse Forests. Publications of the Finnish Ministry of Agriculture and Forestry, No 3b/2008
http://www.fao.org/forestry/media/14177/0/0/

National Support Group Austria of the Forest-Based Sector Technology Platform (2008) National Research Agenda for the Forest-based Sector in Austria. Vienna
http://www.forestplatform.org/easydata/customers/ftp/files/New_files/NRA_austria_webversion.pdf

Norwegian National Support Group of the Forest-based Sector Technology Platform (2007) National research agenda 2007 – 2030. Norwegian forest-based sector.
http://www.treforsk.no/uploads/NRAEngelsk(1).pdf

Polityka Ekologiczna Państwa 2006 (National Policy of Ecology; NPE)
http://www.mos.gov.pl/2materialy_informacyjne/raporty_opracowania/pep.pdf

Polityka Leśna Państwa 1997 (National Forest Policy)
http://mos.gov.pl/2materialy_informacyjne/raporty_opracowania/polityka_lesna_1997.pdf

Polityka Leśna Państwa i Narodowy Program Leśny (National Forest Policy and National Forest Programme. 2005.). CILP, Warszawa.

Puchniarski, H. (2000) Krajowy program zwiekszania lesistosci. Zalesienia porolne (National Programme of Forest Cover Enlargement. Afforestation.) PWRiL. Warszawa.

Report on the accomplishment of the Government Programme 2005-2008 (Raport asupra îndeplinirii prevederilor Programului de guvernare 2005–2008)
http://www.gov.ro/raport-asupra-indeplinirii-prevederilor-programului-de-guvernare-2005-2008__l1a101180.html, Posted on 22.09.2008

Finnish Forest Industries Federation (2006) Research Strategy of the Finnish Forest Sector Cluster
http://www.metsateollisuus.fi/Infokortit/maailmanjohtavanametsaklusterinavuoteen2030/Documents/tutkimusstrategia.pdf (in Finnish).

Rogers, Everett M. (1995) Diffusion of Innovations. 4th edition. New York: Free Press.

Romanian Government (2004) Government Programme 2005-2008 (Programul de guvernare 2005-2008), December 2004
http://x.gov.ro/obiective/pg2005-2008/program-de-guvernare.pdf, December

Romanian Government (2005a) National Development Plan 2007-2013 (Planul National de Dezvoltare 2007-2013), December 2005
http://amposcce.minind.ro/fonduri_structurale/pnd/pnd_files/slide0001.html

Romanian Government (2005b) National Export Strategy 2005 â€" 2009 (Hotarare nr.1.828 din 22 decembrie 2005 pentru aprobarea Strategiei naÅ£ionale de export pe perioada 2005-2009) http://www.minind.ro/strategia_export/SNE/National_exp_strategy.html

Romanian Government (2005c) Romanian Industrial Policy for 2005-2008 (Politica industrialÄƒ a RomÃ¢niei pentru perioada 2005-2008), approved by Governmental Decision HG nr.1172 din 25 septembrie 2005 (Hotarare nr. 1172 din 29 septembrie 2005 privind aprobarea Politicii industriale a RomÃ¢niei pentru perioada 2005-2008 ÅŸi a Planului de acÅ£iune pentru implementarea politicii industriale a RomÃ¢niei Ã®n perioada 2005-2006) http://www.minind.ro/domenii_sectoare/politica_industriala_cf_hg_1172_2005.html

Romanian Government (2008) Report on the accomplishment of the Government Programme 2005-2008 (Raport asupra Ã®ndeplinirii prevederilor Programului de guvernare 2005 â€" 2008), Posted on 22.09.2008 http://www.gov.ro/raport-asupra-indeplinirii-prevederilor-programului-de-guvernare-2005-2008__l1a101180.html

Stone, D. (2001) Learning Lessons, Policy Transfer and the International Diffusion of Policy Ideas." CSGR Working Paper No. 69/01. Warwick/Coventry: Centre for the Study of Globalisation and Regionalisation.

Suomen puutuoteteollisuus 2020 – skenaario- ja strategiatyön loppuraportti. 2006. Finnish Forest Industries Federation http://www.metsateollisuus.fi/files/newsletter/Puturaportti.pdf

Swedish Forest Industries Federation (2006) The Swedish National Research Agenda. NRA-Rådet Skogsindustrierna, Stockholm.

Tews, K. (2002) "Der Diffusionsansatz für die vergleichende Policy-Analyse. Wurzeln und Potenziale eines Konzepts. Eine Literaturstudie." FFU-Report 02-2002. Berlin: Environmental Policy Research Centre.

Valtioneuvoston kanslia (2008) Metsäteollisuuden ja metsäsektorin toimintaedellytystyöryhmä. Loppuraportti 30.9.2008. Valtioneuvoston kanslian julkaisusarja 19/2008. http://www.vnk.fi/julkaisukansio/2008/j19-metsateollisuuden239906/pdf239907/fi239908.pdf

Weibust, I. (2005) A (Slow) Burning Issue: Convergence in National Regulation of Dioxins from Incineration. Policy and Society, 24, 46-73

Norwegian Ministry for Agriculture and Food (1999) Value added and biodiversity – Possibilities in the Forest Sector. White Paper. Skogmeldingen St. meld. Nr. 17 (1998-99) http://www.regjeringen.no/nb/dep/lmd/dok/Veiledninger_og_brosjyrer/1998/Verdiskaping-og-miljo-muligheter-i-skogsektoren.html?id=87472

The wood product cluster's research strategy (2008) Finnish Forest Industries Federation. http://www.metsateollisuus.fi/Infokortit/puutuoteklusterintutkimusstrategia/Documents/Puutuoteklusterin%20tutkimusstrategia_2008.pdf

Ministry of Enterprise, Energy and Communications (2005) The Forest Industry – A Part of Innovative Sweden. Stockholm.

Chapter VII

# National Research Agendas of the Forest-based Sector Technology Platform

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## 1. Forest Technology Platform and Innovation

Increasing economic globalisation since the 1980s has forced national governments to find new strategies to maintain their competitiveness in the world economy. Rapid technological development (e.g. microchip, nanotechnology or bioengineering), shortening product life cycles, global competition, and more stringent customer demands put a strong pressure on the pace and quality of product innovation in companies. In the low-technology industries such as paper manufacturing the development has been strengthened with a modernizing of the machinery, increasing automation, while the companies have grown in size and expanded abroad. This change in business structure has enhanced both market competition and shifts in the aggregate demand of the low-tech industry products. The need to be ever more 'innovative' in economics as well as in political terms has steadily grown.

Since the 2000s, according to the Lisbon strategy, EU policies have had innovation at the centre of all policies in the knowledge-based economy. For that reason, innovation goals can be found in a wide range of policies and regulations and could be directly or indirectly addressed by the policies and regulations. Countries have taken different public policy initiatives in order to foster innovation activities. Innovation is seen as a major factor in fostering economic growth, and stimulating innovation has therefore become a top priority for government, industry and research organisations.

Increasingly, innovation conducted in companies has become the essence of the existence and continuity of companies, leading to its revised role in contributing to society, employment, and innovative companies achieve higher shareholder returns and market values (Salvatore, 2007). The central role of innovation is the long term survival of companies but, at the same time, it constitutes a source of high risk. As a consequence, companies search for ways to improve the performance of their innovation processes asking themselves the question: "*Why do some companies move quickly and efficiently to bring to market outstanding new products, while others expand tremendous resources to develop products that are late and poorly designed?*" (Kratzer, 2001)

Special challenges for the forest sector in Europe have been the increasing demand in the other market areas, changes in the raw material (e.g. fast growing wood plantations) and decreasing investments in internal research and development (R&D), and infrastructure.

One solution to these questions has been the creation of industry wide technology platforms to mobilize Europe's research, technological development and innovation efforts. In 2004, as a part of this process the European Confederation of Woodworking Industries (CEI-Bois), the Confederation of European

Forest Owners (CEPF) and the Confederation of European Paper Industries (CEPI) initiated a process to establish a technology platform for the forest-based sector (FTP).

The FTP aims at defining and implementing the Strategic Research Agenda (SRA), the 'roadmap' of forest-based sector's research and development for the future that would be supported by a wide range of stakeholders. Implementation of the SRA was started in 2006. The SRA consist of five objectives that have been specified into research areas under five so-called "forest-based value chains", i.e. a string of institutions working together to satisfy market demands for a specific set of products and services. These strategic objectives have been specified into research areas under five so-called "forest-based value chains", which are recognized as: (1) Forestry; (2) Wood Products; (3) Pulp & Paper Products; (4) Bio-energy; and (5) New businesses / specialities.

An important element in the implementation of the SRA has been to build-up national research agendas (NRAs) for forest-based sector development in different countries. In some ways, NRAs have similarities with national forest programmes in such a way that they too have country specific targets, while, at the same are, they are used to implement international level common measures at national level. NRAs provide the same goal as the SRA: their intent is to increase the innovativeness and competitiveness of forest-based sector. The SRA and NRA objectives aim at fostering cooperation and interaction via joint projects between universities, institutes, industry and other commercial actors. By October 2008, fifteen countries had started creation of their NRA,[10] of which twelve were completed.

## 2. Objectives of the paper

The SRA aims at supporting and promoting innovation. NRAs are seen as a mean for reaching this goal. Therefore, it is relevant to ask in what ways the creation of national support groups of the FTP and national research agendas truly contribute to promotion of innovation activities and management. This paper asks two questions that relate to the main question of COST Action E51 (integration and coordination activities supporting innovation policy). First, in how far and in which ways do the existing NRAs address or are related to national innovation policy, national innovation systems and innovation activities in individual firms? Second, how the formulation of the NRAs arranged between different public and private actors?

However, not all countries have used similar agenda when it concerns the adaptation to FTP research areas. The way applied depends on the current national strategies e.g. Sweden has taken the NRA agenda from SRA and reflected document Skogs- och träindustri when preparing their NRA. NRA in Sweden describes and explains research needs in the form of 14 national focus areas (NS), whereas Finland has started from their own agenda and the output do reflect directly only strategic objectives and the research areas are own.[11]

## 3. From top-down organization to collaborative governance

Innovation can be understood in many ways. Despite innovation as such is a relatively new research topic, there already exists a myriad of theories covering different aspects related to innovation processes. This paper approaches innovation according to definition by Oslo Manual by OECD (2005) where innovation is either a new or significantly improved product, process or an organisational method.

Innovation is mostly used as a synonym to technological innovation, which sees innovation as a procedure of companies developing new products for the markets through traditional R&D processes.

[10] See http://www.forestplatform.org.

[11] See Suomen metsäklusterin tutkimusstrategia, 2006; http://www.nra-sweden.se.

However, views on innovation have changed considerably during last two decades. (Kaufmann and Tödtling, 2001; Edquist, 2004; Lundvall, 2000; Galli and Teubal, 1997) Innovation is neither exclusively firm's internal activity to achieve monopolistic advantages, nor does innovation depend on the amount of research activities as linear model and product cycle theory argue (Asheim et al. 2003; Bender, 2006). Increasingly, innovation is perceived as an evolutionary, non-linear and interactive process between the firm and its environment (Kaufmann and Tödtling, 2001).

Firms collaborate for a number of reasons, the most common being access to complementary technology and new markets. In some cases the motive to collaborate is to spread the high cost and risk associated with the development of new products based on technological breakthroughs (Perez and Sanchez 2002). According to a metastudy of innovation by Pittaway et al. (2004), principal benefits of business networking for innovativeness include risk sharing; pooling complementary skills; safeguarding property rights when complete or contingent contracts are not possible; and acting as a key vehicle for obtaining access to external knowledge. Successful innovation requires an active and highly sophisticated co-ordination of the efforts of a number of key participants.

During the last decades, the number of organizations engaged in collaborative activities, especially within the R&D area has steadily increased (Science & Technology parks of knowledge intensive business services (KIBS) providers). The benefit of inter-organizational networks on innovation has proved to be more important for young, less established and small firms. Innovate firms become more prone to cooperate, and thus tend to take more central place within an alliance networks, and so are more innovative. (Castellasi et al. 2004) A network of many non-overlapping also provides information benefits for an organisation whose primary business entails the brokerage or technology. Yet, old (often also low) technology industries usually lack this kind of networking model (Pittaway et al. 2004).

Economies' success of innovation depends on how they interact with each other and the financial and public sectors; firms do not only compete in the market but within the framework of institutional and political arrangements. (Bergek et al. 2008) Literature and research related to innovation activities has transferred from national levels towards institutions, firms and value chain creation/maintaining, increasing their importance during last decades. Their role has become qualified to as a factor that can both retard and support innovation. According to Simmie (2004), national and international linkages are as significant for innovation as are more local networks. Leading innovators also rank quite highly certain sources of knowledge that are not associated with space. These include specialised standards such as technical, health and safety, and environmental standards and regulations, which are usually set by government and industry bodies. The regulatory environment associated with the state infrastructure or publicly funded institutional arrangements affects technology development and innovative activity. (Simmie, 2004; Parker and Tamaschke, 2005; Lundvall, 1992) Public policies have an integral role in national innovation systems, even if, according to Edquist (2001), imitation is a very common mechanism of policy-making. In many countries, policy-makers are simply doing similar things to what has been done previously in other countries (or in the same country). A consequence is that variations in national characteristics between countries are often not taken into account. Yet, on the other hand, existing research has indicated that the capacity of the state to coordinate industrial development and transformation varies cross-nationally (Parke and Tamaschke, 2005).

Further, innovation can occur within the institutional sphere in two ways, as an *innovation policy* or *policy innovation*. From these, innovation policy is public action that influences technical change and other kinds of innovations, including elements of research and development (R&D) policy, technology policy, infrastructure policy, regional policy and education policy. This means that in addition

to supporting innovation from the support side (traditional science and technology oriented policy) innovation policy also includes public action influencing innovations from the demand side. Rather than focusing on individual policy initiatives in isolation from their context, it becomes necessary to explore the system of support and the way that it interacts with the broader institutional framework and spatially specific resources. (Parke and Tamaschke, 2005)

Policy innovation, on the contrary, refers to the renewal of policy making in day-to-day interactions in policy arrangements. The driving force of policy innovation is 'to do otherwise. Environmental policy innovations are often driven by bottom-up approach, sometimes sparkling a strong reaction from federal, or industrial, levels, as has been the case in California's strict emission standards, or Danish recycling policies in 1984. In both examples, the new, innovative environmental policies have been later adopted by surrounding states or nations, or the EU (Vogel, Toffel and Post, 2005).

Since the 1990s, policymaking has become more interactive in order to succeed in getting stakeholders to be more engaged. Today a wider range of private and public actors – governments, intergovernmental organisations, supranational institutes and private actors – co-determine the structural outcomes together (Arts and Tatenhove, 2004; Arts 2005; Bovaird, 2005).

As the national political actors have expanded to include stakeholders from the EU, private sector as well as from international organisations, the distinction between 'the domestic' and the 'international' has become blurred (Kettunen, 2003; 2005; Arts and Tatenhove, 2004). This 'paradigm shift' in the way we govern societies and organizations is a result of processes such as relocation of politics from the state to international and sub-national organizations, 'de-territorialisation' (the emergence of new political spaces beyond the territorial nation state), or 'diffusion of political power' (from public authorities to semi-public and private actors). Instead, new forms of governance and policy instruments are taking place in the political arena (Kettunen, 2003; 2005; Arts and Tatenhove, 2004).

Governance implies a shift in the locus of democratic politics: from constitutional politics to politics outside traditional frameworks and institutions, from national to either sub-national or supranational levels (Van Tatenhove and Leroy, 2003). Yet these two developments do not imply the abolishment of 'government', rather do they represent the increasing juxtaposition of government and governance practices (Hage, Leroy and Willems, 2005). As such, the formation of the FTP can be seen as this new way for governance in where the European Union delegates some of its earlier task of supporting innovation to the private sector.

## 4. Materials and methods

The article is based on a systemic comparison of eleven NRAs of the European Economic Area (EEA) and the SRA. Countries outside of EEA or that are yet to finalise their NRAs, and the NRA of Estonia, Slovenia and Spain, in where there was no translation available, could not be included in the analysis. During this paper Lithuanian had only prepared an outline for its National Research Agenda, which is partially analysed. The list of analysed documents is shown in the Table 1.

The analysis form was developed and the document analysis was prepared by members of COST Action E51. The form adapted a questionnaire used within COST Action E51 for the analysis of policy documents that focused on similar research questions. NRAs were both qualitatively and quantitatively analysed. The data collection phase consisted of filling in pre-formulated questionnaire that was divided into two sections; the first section concentrating on different aspects of innovation in both the NRAs and the SRA. The latter part concentrates on administration and coordination of stakeholders during the development of the NRAs.

For the purpose of this study, it is important to distinguish between *the traditional Science and Technology policy approach and systemic innovation policy approach*.

- *The traditional Science and Technology policy approach* is typically characterised with a basic understanding of innovation processes as being linear process. Innovation is seen as the end of research and development processes (solely). Policy focuses on fostering scientific and technological advance, and enhancing the flow of knowledge down along the innovation chain (Rogers, 1995)
- *Systemic innovation policy approach*, on the other hand, is seen as a complex process, taking place in an environment of interacting actors and institutions (innovation system); having multiple sources (apart from research activities); and running through multiple feedback loops between the different stages. Policy approaches the systemic environment in which innovation take place in ways that can better inform decisions about research, commercialisation, technology adoption and implementation, etc (Edquist and Johnson, 1997; Goorden, 2004).

The first part of the article will concentrate on finding out how the NRAs and the SRA approach innovation: using traditional or systemic innovation approaches? Keeping in mind the first research question (in how far and in which ways do the existing NRAs address innovation), the article tries to look at different innovation measures used in the NRAs. These innovation measures may be introduced without the explicit aim of fostering innovation. For the analysis, the following six categories of 'innovation support' were distinguished:

- Research and Development
- Diffusion of Innovation
- Human Resource Development
- Strengthening the Knowledge Base
- Public Demand Creating for Innovation
- Framework Support

The amount and nature of NRAs' objectives were categorised in order to see which of the innovation support categories were most strongly emphasised. Strategic research objectives of these eleven NRAs' and the SRA were categorised based on the above mentioned classification system.

In order to evaluate the relevance and promotion of innovation support measures, the questionnaire requested to qualitatively analyse how highly each NRA and the SRA gave emphasis to the support measures (i.e. strategic objectives), and how innovation was understood in the documents. This part of the innovation analysis also includes the assessment of the NRAs' strategic research objectives. The results are measured against the strategic research objectives introduced in the SRA.

The latter part of the article concentrates on answering what has been the involvement of different public and private actors in the creation of the NRAs. Yet, it's relevant to keep in mind that the analysis is based on the information provided in the NRAs. The information provided in the documents might not always correspond to the actual situation, leaving some important participants unmentioned.

Co-ordination of actors may take place on the administrative level or between administration and stakeholders of different sectors. In this study co-ordination was allocated as:

- Co-ordination within the NSG: Refers to the co-ordination within the NSG.
- Co-ordination between different organisations: Refers to the co-ordination between different private organisations, for example the forest industries and technology enterprises.
- Co-ordination between NSG and organisations: Refers to the co-ordination between NSG and different public organizations, for example Agricultural Ministry.
- Co-ordination between other organisations: Other organizations may include public agencies and councils, such as research organisations, etc.

Participation of stakeholders refers to the involvement of both, private and public actors in the process of creating NRA. The stakeholder involvement shows how the documents were created, and which actors were involved with the process. Since one of the objectives of the FTP is to include as many and wide-spreading stakeholder involvement with NRAs as possible, it was decided to see whether this actually is true. For this reason, the stakeholder involvement was further divided into private and public sector.

**Table 1**. List of analysed documents

| Document | Publication Date |
|---|---|
| Maailman johtavana metsäklusterina vuoteen 2030 / As the Leader of the World's Forest Cluster by Year 2030 (NRA of Finland) | *October 2006* |
| National Research Agenda (NRA) of Denmark – for forest based sector | *2005* |
| A National Strategic Research Agenda (NRA) for the forest based sector in Ireland | *2006* |
| Agenda Strategica Italiana di Ricerca per la filiera forestale (NRA of Italy) | *2005* |
| Vision for Lithuania's forest-based sector NFP | *End of 2006* |
| National Research Agenda of Czech | *05/2008* |
| National Research Agenda 2007 – 2030: Norwegian Forest Based Sector | *2007* |
| National Research Agenda of Germany | *2006* |
| Programme stratégique de recherche Français « foret bois papier » (NRA of France) | *2006* |
| Nationale Forschungsagenda für den waldbasierten Sektor in Österreich (NRA of Austria) | *2008* |
| En nationell strategisk forskingsagenda (NRA) för den skogsbasera näringen i Sverige (NRA of Sweden) | *2006* |
| Strategic Research Agenda (SRA) | *2005* |

## 5. Results of NRA Analysis

### *5.1 Types of innovation support*

Innovation support can take many forms from direct funding of research and development activities to the support of the diffusion of innovations, to improving the knowledge base and interaction of actors, to adapting framework conditions. Some of these support measures are targeted directly at fostering concrete innovation activities, others are of structural character (see Figure 1).

In every NRA and the SRA, the highest priority of supporting innovation is given to R&D: all analysed documents emphasise R&D aspects. The next often supported measures for supporting innovation are framework conditions and diffusion of innovation. None of analysed documents (neither NRA nor the SRA) mentions human resource development or demand creation.

Each document places a high emphasis on innovation, yet innovation is mostly used as a synonym to technological innovation approach. Concentration is on the R&D objectives, and to a lesser degree on framework conditions and diffusion of innovation. Only one document emphasises strengthening the knowledge base (Czech).

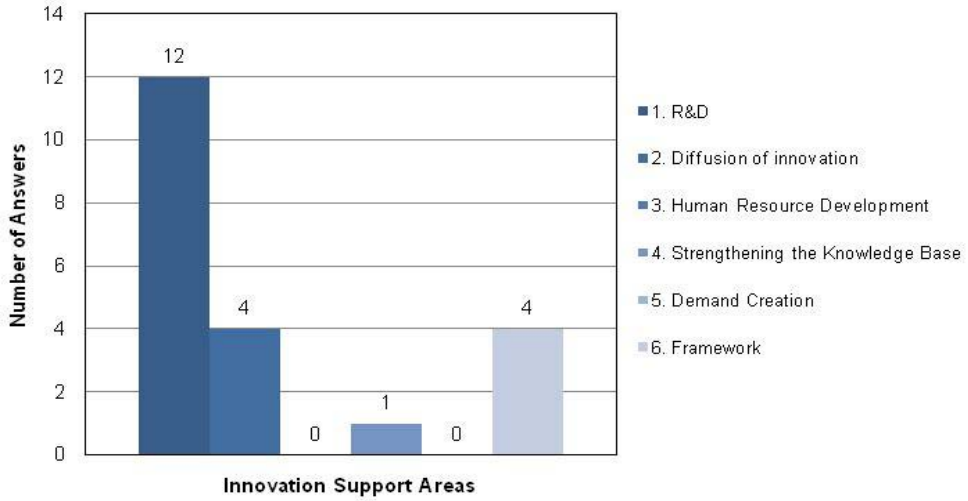


**Figure 1**. Use of different innovation support measures in the NRAs and the SRA

None of the documents support demand creation or human resource development. The slight emphasis on framework support might indicate that there is a slight tendency to move towards more systemic innovation instead of purely technology oriented one.

The questionnaire also assessed the overall relevance that is given to innovation support measures in the documents. The SRA and seven NRAs rate innovation support measures very high.

### *5.2. Understanding of innovation policy*

The results on the innovation support measures are nearly identical with those of innovation relevance (see Figure 2). In order to evaluate relevance of innovation, the overall innovation relevance of the NRA and the SRA is estimated. The evaluation is based on how much the NRAs and the SRA give relevance to 'innovation'. The scale of evaluation starts from 'no relevance' and ends at 'central issue'. Nearly in all NRAs, innovation is central or very important issue. Also in the SRA. Relevance of innovation appears to be lowest (issue among other issues) in Germany's NRAs.

Most of the NRA documents appear to understand innovation traditionally with only a slight shift towards systemic understanding of innovation policy. This is also the case with the

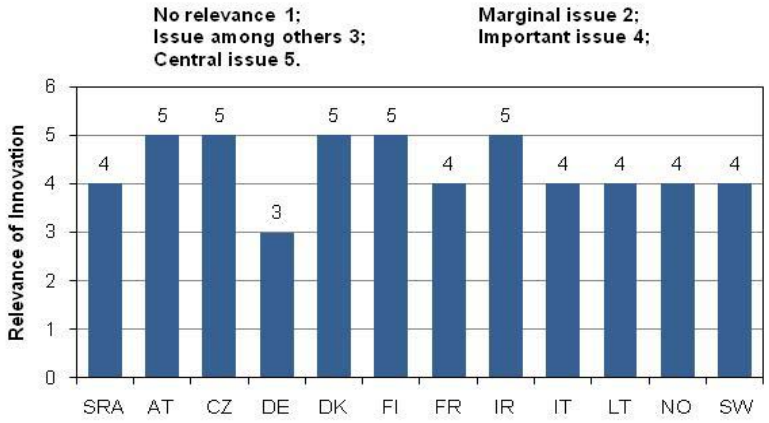


**Figure 2**. Relevance of Innovation

SRA (see Figure 3). From the analysed documents, Czech has the strongest emphasis on the systemic innovation (systemic with traditional elements). Concerning other NRAs, most of the concrete measures aim at developing new products. For example, Italy has more than 20 individual activities/objectives listed under "forestry chain".

### *5.3. The strategic objectives*

Most of NRAs have as their five strategic objectives the same five objectives named in the SRA, which are:

1. Development of innovative products for changing markets and customer needs.
2. Development of intelligent and efficient manufacturing processes, including reduced energy consumption.
3. Enhancing availability and use of forest biomass for products and energy.
4. Meeting the multifunctional demands on forest resources and their sustainable management.
5. The sector in a societal perspective.

These strategic objectives are specified into research areas under five so-called "forest-based value chains", i.e. a string of institutions working together to satisfy market demands for a specific set of products and services. The five value chains recognised within the FTP are: (1) Forestry; (2) Wood Products; (3) Pulp & Paper Products; (4) Bio-energy; and (5) New businesses / Specialities. Only Germany and Finland have their research objectives arranged according to their own devise and for this reason, they both are excluded from the analysis of the Strategic Objectives.

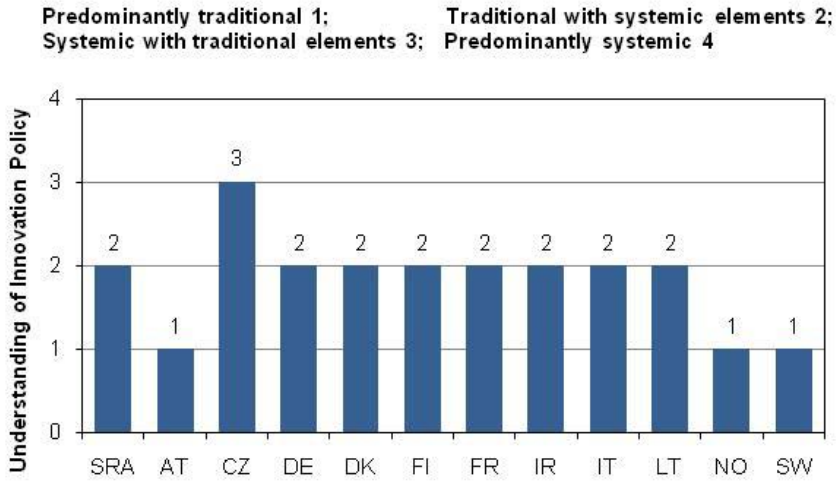


**Figure 3**. Understanding of Innovation Policy

*5.2.1 Product and Process Objectives*

**Table 2a**. Strategic Objectives: Products

| Country | Forestry | Wood-based industries | Pulp & Paper | Bio-energy | Specialties |
|---|---|---|---|---|---|
| *SRA* | 1 | 4 | 5 | 2 | 3 |
| *AT* | | 5 | 2 | 1 | 3 |
| *CZ* | 1 | 2 | | 1 | |
| *DK* | 1 | 2 | | 1 | |
| *FR* | 1 | 3 | 3 | 1 | 1 |
| *IR* | 1 | 2 | 1 | 1 | |
| *IT* | | 9 | 6 | | |
| *SW* | 1 | 2 | 3 | 1 | |

**Table 2b**. Strategic Objectives: Process

| Country | Forestry | Wood-based industries | Pulp & Paper | Bio-energy | Specialties |
|---|---|---|---|---|---|
| *SRA* | | 2 | 3 | 2 | |
| *AT* | | 2 | 3 | 1 | 1 |
| *CZ* | | | 2 | | |
| *DK* | | | | 1 | |
| *FR* | | 2 | 3 | 1 | |
| *IR* | | 2 | | 2 | |
| *IT* | 8 | 2 | | | |
| *SW* | | 1 | 1 | 2 | |

**Table 2c**. Strategic Objectives: Biomass

| Country | Forestry | Wood-based industries | Pulp & Paper | Bio-energy | Specialties |
|---|---|---|---|---|---|
| *SRA* | 2 | 1 | 1 | 1 | 1 |
| *AT* | 1 | 1 | 1 | 1 | |
| *CZ* | 1 | | | 1 | |
| *DK* | 2 | | | | |
| *FR* | 2 | 1 | 1 | | |
| *IR* | 2 | 1 | 1 | 1 | |
| *IT* | | 2 | 2 | | |
| *SW* | 2 | 2 | 2 | 2 | |

**Table 2d**. Strategic Objectives: Multifunctional perspective

| Country | Forestry | Wood-based industries | Pulp & Paper | Bio-energy | Specialties |
|---|---|---|---|---|---|
| *SRA* | 4 | | | | |
| *AT* | 3 | | | | |
| *CZ* | 2 | | | | |
| *DK* | 5 | | | | |
| *FR* | 3 | | | | |
| *IR* | 2 | | | | |
| *IT* | 3 | | | | |
| *SW* | 1 | | | | |

**Figures 2a-d Number of Strategic Objectives (Product 2a, Process 2b, Biomass 2c, Multifunctional perspective 2d) in each value chain (forestry, wood based industries, pulp and paper, bioenergy, specialities, other) of the analysed NRAs and the SRA.**

Both the SRA and NRAs concentrate on developing new products, processes, and enhancing availability of forest biomass in most cases. The results of strategic objectives, however, vary between countries to some degree. This variation can, for the most parts, be explained by the differences between countries' industrial structures. For example, Italy's NRA includes a lot of different objectives on both forestry products and forestry processes, reflecting the importance of non-forest goods and services (e.g. cork). The emphasis is further highlighted by the fact that Italy's NRA is the only document that aims at developing new process within the 'forestry' value chain.

The NRA of Denmark includes only forestry, wood based products and bioenergy value chains. Ireland's NRA, on the other hand, lacks pulp & paper and speciality products. The NRAs of Sweden and Ireland emphasise biomass more than other countries. Developing of biomass is also important to Austria and France, but to a lesser degree. In general, if compared to other value chains, it appears as biomass would be rather modesty promoted with regards to number of specific objectives. On the other hand, biomass is included to the NRAs both as a value chain and as a as an objective.

Value chain 'wood based industries' includes the highest amount of single objectives mostly concentrating on developing of new products. Wood based industries are closely followed by pulp & paper. From the different NRAs, Italy's, Sweden's and France's NRA appear to have a strong concentration on pulp and paper, since they include the highest amount of objectives. Generally, the least supported objective is the 'multifunctional demand of forest resource', which is only included within forestry chain. Measures and objectives of this objective are actions such as supporting and securing the usage of forests for recreational and industrial purposes.

*5.2.2 Societal Objectives*

Societal objectives include three different categories: performance of the forest-based sector, forest-sector governance, and citizens' perceptions. These research objectives are defined in the SRA as following: Performance of the sector is linked to creating and developing technology and production knowledge on the sustainability of the forest

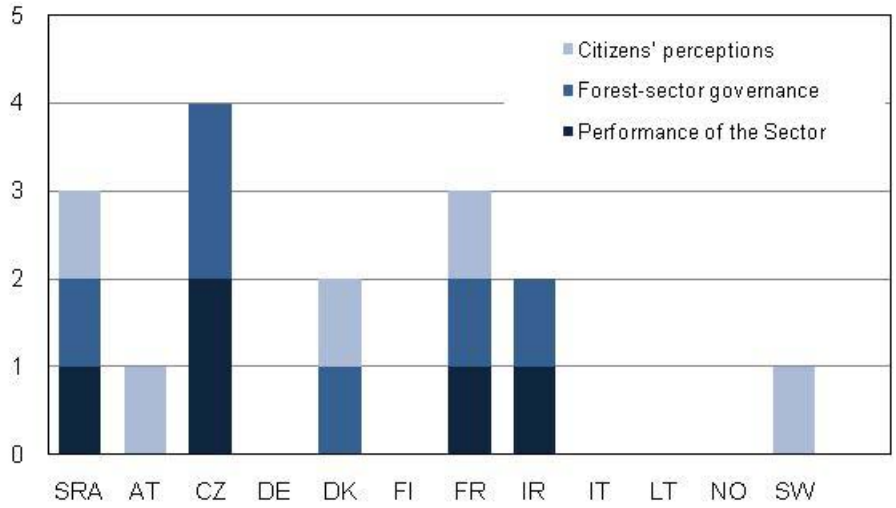


**Figure 4**. Strategic objectives (societal perspective) of the analysed NRAs and SRAs

**Table 3**. Co-ordination in the NRAs

| Country | Co-ordination within the NSG | Co-ordination between different organisations | Co-ordination between NSG and organisations | Co-ordination between other organisations |
|---|---|---|---|---|
| *AT* | x | x | x | x |
| *CH* | x | x | x | |
| *DK* | x | x | x | |
| *FI* | x | x | x | x |
| *FR* | | x | x | |
| *GE* | x | x | x | x |
| *IR* | x | x | x | x |
| *IT* | x | x | x | x |
| *SW* | x | x | x | x |

sector; Forest-sector governance refers to creating instruments for the management of policy issues, and; Citizens' perceptions relate to opinions and perceptions of consumers and citizens' on the forest-based sector in general (SRA, 2005).

It seems the NRAs have no particular strong emphasis on the societal objectives, whereas the product and process objectives dominate the strategic objectives, at least based on the amount of single objectives. Only the NRA of France includes all three categories of the societal objectives that are also included in the SRA, whereas other countries included two, one, or none (see Figure 4).

### *5.4. Involvement of actors in the formulation of the NRAs*

In the evaluation of the administrative and coordinative formation of the NRAs, the group of actors involved in the formulation process is assessed: which actor groups are included. This is followed by a more detailed analysis of the stakeholder groups that were included in the involvement in the NRA formulation process.

The formation of the NRA includes co-ordination within the actors of the National Support Group (NSGs) and member organisation, between the NSG and other private organisations, and between the NSG and public organisations. In addition, nearly every NRA also includes actors from other organisations such as research organisations or universities. Every document creation involves more than one organisation that contributes a wide collaborative network stretching from vertical to horizontal coordination.

For the evaluation of private sector participation in the NRAs seven categories were set apart (see Figure 5). Stakeholders were divided into categories: forestry, forest based industry, agriculture, tourism, energy, environment, other: universities, and others. The 'others' referred to NGOs, independent research organisations, or trade unions, etc. With public sector, it was decided to assess for ministries that were involved with the process of creating NRA.

When evaluating the results of the stakeholder participation, one has to keep in mind, however, the fact that evaluation is based on the information provided in the documents. This information might sometimes exclude some parties that were involved informally or for some other reason are not mentioned in the document.

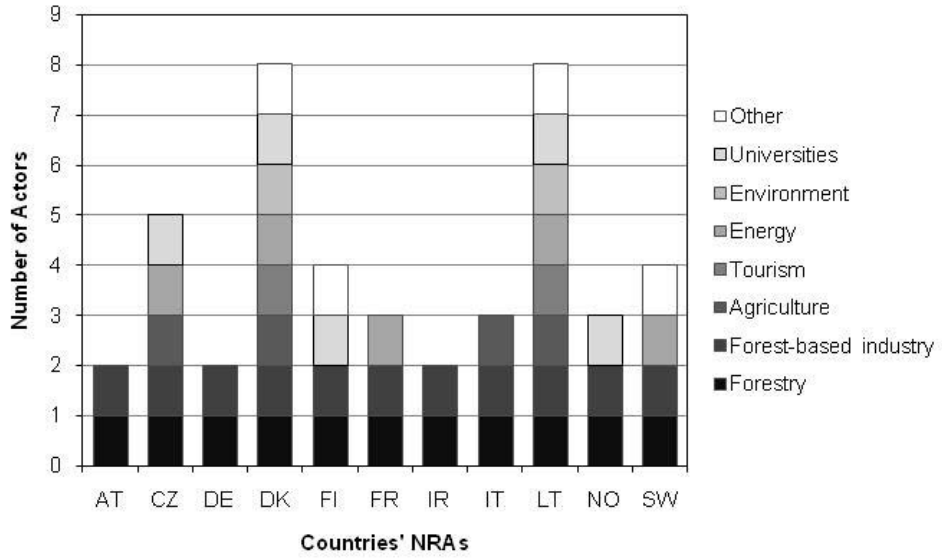


**Figure 5**. Private stakeholder involvement

Broad stakeholder participation is one of the main aims for Vision 2030, the SRA, and the NRAs alike. The purpose of the FTP is to comprehensively incorporate varying stakeholders with the process of creating comprehensive knowledge network to meet the needs of industry. However, based on these results, most of the NRAs appear to include only few different stakeholder categories. Each of the NRAs includes many private stakeholders, but most of these stakeholders come from forestry and forest-industry. In some cases, stakeholders representing energy and agriculture are also involved. Denmark and Lithuania incorporate private stakeholder most comprehensively, including all eight private stakeholder categories. The second highest private stakeholder involvement has Czech with five categories. After that come Sweden and Finland with an involvement of four different stakeholder categories.

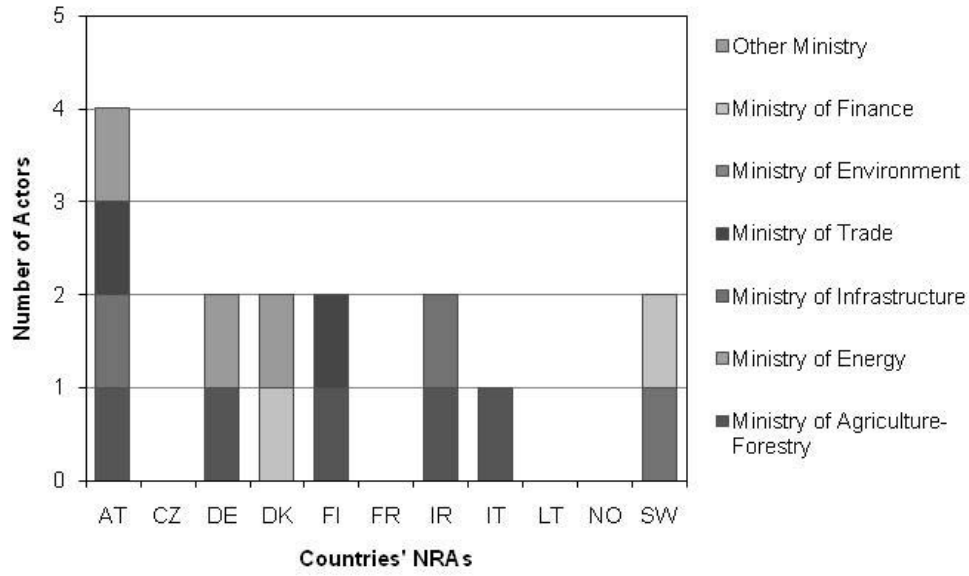


**Figure 6**. Public stakeholder involvement

There is more deviation in the public stakeholders than in private. On the other hand, public stakeholders are rather scarcely represented in the each NRA. It also appears as if agriculture and forestry ministries are not always even involved, e.g. agriculture and forestry ministries lack from the NRAs of both Sweden and Denmark.

## 6. Discussion

NRAs are highly innovation oriented, well-coordinated and well-refined documents. On the other hand, they are also very technology-oriented and social aspects of forest-related issues are only marginally presented in their objectives. Strategic objectives concentrate more on traditional product and process development.

In general, NRAs include a lot of stakeholders but only from few selected stakeholder categories; those being mainly forest-related sectors (forestry, forest-industries; to lesser degree energy and agriculture). NRAs have a strong connection to R&D facilities (such as universities). NRAs also have a wide network of many private actors but small involvement with public organisations, and sometimes forestry and agricultural ministries are not even included. This is consistent with findings of Pittaway et al. (2004) about traditional industries being less inclined to formation of wider partner networks. Exclusion of other stakeholder groups implies that there is either lack of interest of involving other sectors in the formation of the NRA, or that there exists some sort of barriers hampering the involvement of wider stakeholders groups.

Even if the actors and stakeholders of the NRAs act as national agents, in most cases they are international organisation and operate at global scale. An interesting aspect is that public sector has very little involvement with the creation of the NRAs. This can be interpreted at least in two ways. First, the lack of public actors confirms, as suggested in governance theories, that the private sector has replaced public sector in promoting forest industries and innovation support. Second, it also implies lack of public-private contracts and further supports the earlier findings on the forest-based sector's lack of interest to create wider stakeholder networks. If we consider the FTP as taking the role of traditional public policies, an interesting finding is the absence of some traditional governmental support tools, e.g. lack of public sector demand creation. As mentioned earlier, demand creation is one of the main activities for governments to support innovation. However, none of the NRAs includes demand creation as their objective. All NRAs emphasize the importance of the R&D. Framework conditions and diffusion of innovation are also promoted but to a lesser degree. Innovation measures and governance, instead of promoting other aspects of innovation, is more concerned about the traditional R&D, concentrating on the new product and process development. This is not to say systemic innovation policies do not exist in the NRAs or the SRA but they are clearly given less attention.

Overall, the NRAs and the SRA resemble each other. The NRAs have adopted a very similar approach to innovation with the SRA, following the SRA's structure very strongly and integrating the FTP guidelines to their agenda. Almost all NRAs have similar structure (aside of Finland and Germany) with the SRA. This is also the case with strategic objectives table, which is often kept unchanged and incorporated as such in the NRA document. Yet, the individual results differ. Even when countries apparently imitate SRA, they have adapted the objectives based on the country special features (e.g., Italy having a strong concentration on non-wood forest goods; emphasis on bioenergy in Sweden and Finland; pulp and paper in Sweden, wood based industry in Austria). Innovation is addressed very similarly, but the NRA objectives vary between countries, and steps to promote forest-based industries at the national level are organised according to each country's industrial structure. Even if they have adapted SRA according to each nation's special features and characteristics, the NRAs are highly impacted by the SRA.

## 7. Conclusion

Recently, there has been at European and national level tendency for developing new governance arrangements in where public sector delegates its responsibilities to private actors. The creation of the FTP, SRA and NRAs is only one example of this kind of development. According to Arts and Van Tatenhove (2004), the reason of re-organizing governance arrangement has been seen as a good way out of hierarchical and top-down co-ordination; as a change to include a lot of different stakeholders; engage with a strong dialogue, and encourage innovation. Based on finding of this article, it appears that NRAs do not always contribute to these goals as strongly as originally indented and stated in the SRA.

Innovation is important to NRAs, but at the same time, it is understood very traditionally. The main means to achieve goals mostly rely on traditional R&D oriented innovation process cycle, developing of new products and processes. In this aspect, NRAs do not appear to rely on systemic innovation policies. Naturally, there are some differences: countries vary with regards to amount of the objectives of their NRAs. On the other hand, they also appear to follow similar patterns, giving only little support to forestry chain in product and process objectives but more with regards to wood based industries, pulp and paper, and bioenergy. The documents are mostly concerned with traditional innovation support goals but give less attention to systemic innovation goals such as societal objectives. They also lack varying stakeholders from both public and private sectors.

Forest-based industries are often blamed to be old-fashioned with a strong hierarchical structure and conventional business models. The FTP's aim is to increase innovation and respond to the dire challenges forest industries are facing today. However, if one considers the strategies adopted by FTP and NSGs, it appears that the approaches to address these issues have remained rather conventional. In innovative and competitive world new strategies and approaches have to be made. One way to support innovation at business level would be impacting frameworks and institutions as to support the change in the whole industry as also in single companies, e.g. by including actors outside of sector. Incorporating many stakeholders was one of the objectives for the formation of forest-based technology platform, and the Strategic Research Agenda. Reasons to why national research agendas are not fulfilling this objective are not included to the scope of this study, and should be inspected more throughout in the future.

## 8. References

Asheim, B., Coenen, L. and Svensson-Henning, M. eds. (2003) Nordic SMEs and Regional Innovation Systems. Final Report

Arts, B. (2005) Non-state actors in global environmental governance: New arrangements beyond the state, in: the New Modes of Governance in the Global System. Exploring Publicness, Delegation and Inclusiveness. Mathias Koenig-Archibugi and Michael Kiirn, Belgium.

Arts, B., and Van Tatenhove, J. (2004) Policy and power: a conceptual framework between the 'old' and 'new' policy idioms. Policy Science, 37, 339-356

Bender, G. (2006) Peculiarities and Relevance of Non-Research-Intensive Industries in the Knowledge-Based Economy. Final Report of the Project PILOT http://www.pilot-project.org

Bergek, A., Jacobsson, S., Carlsson, B., Lindmark, S. and Rickne, A. (2005) Analyzing the Dynamics and Functionality of Sectoral Innovation Systems – A Manual. Paper presented at the DRUID Tenth Anniversary Summer Conference 2005 on "Dynamics of Industry and Innovation Organisations, Networks and Systems". Copenhagen, Denmark, June 27-29, 2005.

Bergek, A., Jacobsson, S., Carlsson, B., Lindmark, S. and Rickne, A. (2008) Analyzing the functional dynamics of technological innovation systems – a scheme of analysis. Research Policy, 37, 407–429

Castellacci, F., Grodal, S., Mendonca, S. and Wibe, M. (2004) Advances and Challenges in innovation studies. Journal of Economic Issues, XXXIX (1), 91-121.

Edquist, C. (2001) The Systems of Innovation Approach and Innovation Policy: An account of the state of the art. Lead paper presented at the DRUID Conference, Aalborg, June 12-15, 2001, under theme F: 'National Systems of Innovation, Institutions and Public Policies'

Edquist, C. (2004) Systems of Innovation – A Critical Review of the State of the Art. In : Handbook of Innovation, J. Fagerberg, D. Mowery and R. Nelson. Oxford University Press.

Galli R. and M. Teubal (1997) Paragicmatic Shift in National Innovation Systems. In: Edquist, C.: Systems of Innovation. Technologies, Institutions and Organizations. London and Washington, Pinter.

Goorden, L. (2004) Innovation Policy and Technology Assessment in Flanders. Antwerp, STEM – Research Centre on Technology, Energy and Environment.

Hage M., P. Leroy, E. Willems (2005) Participatory approaches in governance and in knowledge production: What makes the difference? In: International Sociology Association Conference, 6-7 July 2005, Marseille, France Environment, knowledge and democracy.

Hooghe, L. and G. Marks (2001) Types of Multilevel Governance, in: European Integration online Papers (EIoP) Vol. 5 (2001) N° 11.

Johnson, B. (2007) Systems of innovation, the urban order and sustainable development. Waste Management Research, 25, 208-213

Kettunen P. (2005) Globaalin talouskilpailun nationalism. In: Nationalismit, WSOY, Helsinki.

Kettunen P. (2003) Historian poliittisuus ja kansallinen katse. In: Mennyt, Nykyinen ja Tuleva. Historiantutkimuksen tila ja tulevaisuus, Historiallinen aikakausikirja, Helsinki 1/2003.

Kratzer, J. (2001) Communication and Performance – An empirical study in innovation teams: A PhD thesis, Rijksuniversiteit Groningen.

Könnölä, T., Salo, A. and Brummer, V. (2008) Foresight for European Coordination: Developing National Priorities for the Forest-Based Sector Technology Platform. International Journal of Technology Management. 75, 483-495

Lundvall, B-Å. (1992) National systems of innovation: Towards a theory of interactive learning. London: Pinter.

National Research Agenda of Austria

National Research Agenda of Czech

National Research Agenda of Denmark

National Research Agenda of Finland
http://www.metsateollisuus.fi/Infokortit/Tutkimus_painopisteet/Sivut/default.aspx

National Research Agenda of France

National Research Agenda of Germany

National Research Agenda of Ireland
http://www.forestplatform.org/easydata/ customers/ftp/files/New_files/NRA_Ireland_revised.pdf

National Research Agenda of Italy

National Research Agenda of Norway

OECD (2005) Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data. Paris, OECD.

Parker, Rachel L. and Louise Tamaschke (2005) Explaining regional departures from national patterns of industry specialisation: regional institutions, policies and state coordination. Organization Studies, 26, 1787-1808

Perez, M. and Sanchez, A. (2002) Lean production and technology networks in the Spanish automotive supplier industry. Management International Review, 42, 261.

Pittaway, L., Robertson, M., Kapal, M. and Denyer D. (2004) Networking and Innovation: A Systematic Review of the Evidence, Working Paper, Lancaster University Management School.

Rogers, E. M. (1995) Diffusion of Innovation, fourth edition, the Free Press, New York.

Salvatore, D. (2007) The US challenge of European firms: globalisation, architecture, admiration and perceived innovativeness. European J. International Management, 1, 69-80

Simmie, J. (2004) Innovation and Clustering in the Globalised International Economy. In: Urban Studies 2004; 41; 1095-1112. Sage Publications.

Tödtling, F. and Kaufmann, A. (2001). The Role of the Region for Innovation Activities of SMEs. European Urban and Regional Studies, 8, 3, 203-21. Sage Publishing.

Van Tatenhove, J. and Leroy, P. (2003). Environment and Participation in a Context of Political Modernisation. In: Environmental Values, 12/2, pp. 155-174. White Horse Press.

The Strategic Research Agenda of European forest based sector

Vision 2030 for European forest based sector

Vision for Lithuania's National research agenda

Vogel D., Toffel, M. and Post, D. (2005) Environmental Federalism in the European Union and the United States. Prepared for publication in A Handbook of Globalization in Environmental Policy: National Governments Interventions in a Global Arena F. Wiken, K. Zoeteman and J. Peters, ed. E. Elger.

Weiss, L. (1998). Globalization and the Myth of the Powerless State
http://www.adm.ufba.br/milani/Linda%20Weiss%20Myth.pdf

Chapter VIII

# Summary Results and Conclusions

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## 1. The challenge to coordinate policies for sustainable innovation

Innovation is undoubtedly a central element in the transformation of society and economy – determining the very direction and pace of development. As such, it is an integral part of all governance systems, including markets, networks, and hierarchies. The term "innovation" has mostly been used in a market context, where competition and the identification of profit opportunities are a more obvious setting for innovation than networks and (administrative) hierarchies. In fact, some economists argue that it is not competition over prices, but competition over innovation that makes the market economy system tick. This competition over innovation often plays out via advances in technology. To various degrees, innovation policy has often used market failure rationales of under-investment in technology research and development to justify "intervention" in the market system. Hence, for a good part of recent decades, innovation policy was essentially technology policy coupled with economic policy to push forward competitiveness and employment generation.

More recently, much has changed in the perception of innovation, its importance, what drives it, how it works, and what its effects are. In sum, a concept that used to be simple, bounded and neat – making technology improvements and getting them to markets – was found to be much more pervasive and, at the same time, more elusive than initially thought. Not only were innovation processes found to not be linear, it was also evident that a simple innovation policy instrument approach ("pump money into research, and you will then get a predictable amount of innovations as an output") did not work as envisaged. Many additional factors play a role in innovation and, if it comes to innovation policy, a lot of institutional innovation is evidently needed to elaborate the empirical evidence that innovation is a cross-cutting issue, and needs a policy that is similarly cross-cutting. In this respect, innovation policy is thus similar to environmental policy – both require a broadly-based, "horizontal" policy orientation across governmental structures and private bodies. With regard to environmental policy, it took decades to get the message through that environmental issues are relevant to all segments of policy, and that environmental issues or sustainability concepts need to be integrated into policies. Similarly, it is anticipated that it will take time for innovation principles to be absorbed into different areas of policy-making.

If innovation policy is a "horizontal" policy issue, it is not only a task to integrate policy into a range of existing policy fields. Similar to sustainability policies, it is also a question of policy co-ordination. Not only do government bodies need to promote communication and coordination among those involved in the innovation process, they also must be expected to properly integrate and coordinate their innovation and development-related policies themselves. This coordination is needed both vertically within hierarchies of ministries, departments, and agencies, and horizontally across different ministries and agencies, and non-governmental stakeholders. With regard to the forest sector, this requires the exploration of innovation

policies proper, research policies, rural and regional development policies, sustainability and general economic development policies, environmental and energy policies, and others.

Improving the coordination of government policies across government departments, improving the coordination of different levels of government and bringing government and citizens together in policy development surrounding innovation was begun quite some time ago. However, this was done with a focus on general innovation policy and with limited recognition or awareness of the importance of mature, “low-tech” industries, and particularly those in this group that are SMEs. This ignorance prevailed for quite some time irrespective of the fact that the large majority of added value is produced in this part of the economy, and that this major part of the economy is linked in multiple ways to the growing “high-tech” sectors, on which past policies often tended to focus.

Emerging lessons from the work undertaken in COST Action E51 indicate that the integration of innovation into policies might happen “by itself”, as different sectors, over time, recognise the importance of innovation for their respective sector’s performance and – sometimes – survival. However, there is reason to believe that a more conscious push and an overall governmental strategy would help make this a more widespread and expeditious process. As such, the push given through the EU Lisbon process has been a key factor for promoting the integration of innovation into different sectoral policies.

Co-ordinating policies across different areas of government competence can be, and often is, left to “free market forces” of individual administrations and related stakeholders’ economic or political cost and benefit calculations. Judging from the results of the co-ordination of forest-related policies, this seems to be the prevailing situation. If this is seen to produce insufficient results, policy makers or stakeholders often push for a more goal-focused or results-based approach across a range of previously split competencies – such as the one developed by the Forest Technology Platform. This requires the development of a more clearly articulated strategic framework of goals and specific, results-oriented benchmarks in order to keep the focus. To make this exercise lasting, it is important to involve as many stakeholders as possible in the development and adoption of a strategic framework. To make this exercise forward-looking requires exercising leadership and pushing for, and encouraging more, radical and forward-looking perspectives.

In order to attain the desired results in a strategic framework, it is then necessary to follow this up with reforms of the structures and processes by which the government's (or the stakeholder’s) decisions are implemented. One quite deep change in structures and processes is the accession of new Member States to the EU, where completely new structures and procedures have been set up to be implemented, e.g. the Rural Development Regulation, and manage related programme budget flows. Experience has often shown that, once the general strategic framework is in place, structures and procedures need to be aligned in a way that individuals working along the foreseen procedures in these structures need incentives to indeed work towards the strategic goals. This might require a number of components, including a results-based reporting and accountability process (similar to those used in tracking budgets in the EU Rural Development Regulation) and discretionary decision making at the level of the execution of cross-sectoral framework goals. One key intervention to engender work across formerly split competencies within or across organisations is to re-arrange budgeting in a way that establishes incentives for departments to cooperate, for example, by creating pooled budgets for horizontal policy initiatives.

Policy co-ordination is evidently a perennial issue, and not only one related to co-ordinating innovation policies across different policies of a sector. What is a bit different, perhaps, is the character and amount of policy co-ordination that are undertaken. This is likely to vary with the greater or lesser importance and strategic nature of the issues or goals at

hand. Society, through its policy makers, has largely realised the strategic importance of some environmental issues, such as climate change and, in general, widely supports sustainability. Does it also accord high importance to innovation as a way of taking up new knowledge and putting it to use? Has it found a good way to integrate change (innovation) and perpetuity (sustainability), both of which are needed for the often-stated goal of "sustainable development"?

## 2. Integration of innovation in forest-related development policies

The seven policy fields that are compared in this book have developed in different contexts, and they all pursue different main goals. Some of the policies – such as forest policy – have long historical backgrounds; some – such as renewable energy policy – have been established rather more recently. Some policy areas – such as those on the forest-based industry in several countries – are not explicitly institutionalised by specific political programmes. Furthermore, some are more strongly, and some only weakly, defined by political processes at the European level: While the European Union has well developed policies for fostering innovation, sustainable development, regional and rural development, for instance, the forestry field and the forest sector are not very specifically regulated at the EU level. In the mentioned common policies of the EU there are very specific requirements for national policy making, such as the demand to develop national reform programmes, sustainable development strategies, as well as regional and rural development programmes. This is not the case in forest policy, which does not constitute a common EU policy according to the Treaties. EU policy, however, still has an important influence on the forest sector, directly by the EU Forestry Strategy and Forest Action Plan, and indirectly through other policy fields such as, for instance, rural development. The support for rural development, the Forestry Strategy and the Forest Action Plan envisage that Member States would develop their forest policies by means of National Forest Programmes (NFPs) and that the NFPs would be coordinated in some way at the EU level. However, such a co-ordination has hardly taken place so far. This fact would suggest great differences between NFPs from different countries, and even more between NFPs and other policy documents. It is an interesting result of the analysis by Weiss et al. that the property of being a formal NFP or not does not seem to matter much: Our analysis does not reveal great differences between formal NFPs and other central forest policy documents from countries where no NFPs exist – at least concerning our research questions (the integration of innovation in the forest policies and coordination with other policy fields and stakeholders).

How different and how similar are the compared policies then, across countries and sectors? The different policy contexts and goals would suggest quite considerable differences for policies with such different goals as innovation or sustainable development. Our analysis examined, among others, the central goals and issues that are formulated as the general background for the policies. While sustainable development and renewable energy strategies emphasise ecological/environmental goals, the regional and rural development programmes put social goals, such as the alleviation of regional disparities and the keeping of rural areas populated, at the centre of their concern. Forest and forest-based industry policy documents most often mention economic as well as ecological goals, but social aspects are hardly mentioned. We see that none of the policies cover ecological, economic, or social goals in a balanced way, which are the three areas that are often predicated as the pillars of sustainable development.

In the following section, we will further examine how far, and in which way, these policies refer to innovation as a major goal and issue.

*Innovativeness is an issue, but comprehensive innovation policies are lacking*

As expected, innovation is an issue that is present the strongest in innovation policies (Weiss et al.), but how strong is it in other policies? According to the analyses of the policy documents, forest-based industry policies are also strongly oriented towards innovation-related goals. Assuming that industry-related policies would be more strongly oriented towards innovation, then forest policies are not typical industry policies: In terms of innovation orientation, forest policy documents are in the middle range together with regional and rural development programmes. In sustainable development and renewable energy strategies, innovation is not formulated as a central issue. It is surprising that regional development policies do not focus more strongly on innovation support, although they should be closely linked to the Lisbon Strategy of the EU, and the same accounts for the rural development policies. Furthermore, these results suggest that the forest-industry is aware of the role of innovation, although some would suspect this sector to be not very innovation-oriented. Finally, for the renewable energy strategies, it seems alarming that they hardly mention innovation needs among their main aims.

An important result, certainly in most countries, is that forest and forest industry policies are usually quite disconnected from innovation policies. With some exceptions in countries in which the forest sector contributes strongly to the national gross product, such as in Finland, the forest sector is hardly dealt with in the national innovation system: according to our analyses, the innovation frontiers of the sector are hardly included in national innovation and regional development policies.

Possibly, the topic of innovation as a whole receives growing awareness in all of the analysed policy documents. Our analysis did not include in a systemic way a comparison with the past but the country reports behind the analysis often include indications that support this assumption. The Lisbon goals seem to be increasingly taken up in policy texts. However, what is also seen is that innovation is not coherently included in the sectoral policies: forest policies name the goal but largely lack corresponding measures; the forest-industry often lacks specific public policies and is often ignored by national innovation and regional development policies; renewable energy policies lack a strong innovation focus. In other words, weaknesses from within the sector (lacking innovation focus) add to weaknesses from outside (a poor integration of the sector in generic innovation policies).

*Systemic rhetoric is taken up, but traditional measures prevail*

One similarity across the different policy areas of the analysis by Weiss et al. seems to be the tendency towards a systemic understanding of innovation policy. Although differences exist between the policy areas – with regional development programmes most often representing a pronounced systemic understanding and renewable energy strategies most often representing a very traditional research-oriented view – systemic elements increasingly have their place in the documents. At the same time, the results also suggest that the systemic understanding is more prominently found in the rhetoric and less in the type of means that are employed to support innovation: The goals of National Reform Programmes are strongly formulated from the view of systemic innovation support, but the employed measures are predominantly R&D, similar as in regional development programmes. It seems that it is easier to change the wording than it is to change the measures that are already established in national policy contexts.

*Formal coordination is foreseen but informal interests stand against it*

A similar gap between formal goals and informal practice is found when it comes to the coordination of actors. Policy-making in general often requires some coordination across administrative levels, across sectors and between public and private bodies. This is essentially true for cross-cutting issues,

such as environmental and sustainable development policy. Innovation policy has also been defined as a cross-cutting goal of EU policy that should be considered in all policy areas. Innovation, as such, is a phenomenon that often results from the interaction of diverse actors: the novelty often lies in the new combination of existing things or it flows from looking at a problem from new angles. The analysis by Weiss et al. looked at the formal provisions for the formulation of the policies and it resulted in no striking differences between the policy fields. It is remarkable that all policies seem to be well coordinated but a large amount of the literature deals with the problems of inter-sectoral coordination and stakeholder participation in policy-making. It seems that the picture here is the same as in other policy issues: formally, coordination is done, but in reality there are huge gaps. The informal level and the implementation phase were not covered in the chapter by Weiss et al. but rather in the case studies on RDP (Sarvasova et al.) and FTP (Tykkä et al.), which drastically show how limited the effective coordination between the sectors really is. With this, our results are in agreement with and prove earlier studies on the coordination of innovation policies in the forest sector (Rametsteiner et al. 2005).

*The sector gives some answers to societal challenges but blind spots remain*

The policy outputs are in effect that radical innovation is hardly supported in the forest sector, but there is certain awareness and support with regard to a number of innovation fields in which further diffusion is supported. These innovations include topics that are related to problem fields of societal relevance, particularly bio-energy and recreation. The production and advanced use of bio-energy from forests is directly related to climate change mitigation measures, one of the hot topics of global policy today. Recreation and tourism is one of the strongest growing sectors of modern society. These areas have been reported by the experts within the COST Action E51 as important recent innovation fields in most countries (Weiss et al.).

Other areas of social relevance, however, are not so pro-actively promoted by all political actors in the sector. The conservation of bio-diversity is still vividly discussed on the global and European levels but is only mentioned in a few countries as a focus of innovation. Even less visible are other environmental services such as drinking water production, protection against natural hazards, health-related or spiritual services. In 2007, the European Commission launched the Lead Market Initiative for Europe in which six future sectors were selected that are seen as highly innovative and that are believed to provide solutions of broader societal, environmental and economic challenges: eHealth, protective textiles, sustainable construction, recycling, bio-based products and renewable energies. At least in three of these six markets, the forest-based sector has a significant potential: sustainable construction (with the environmentally-friendly material wood that also stores carbon), bio-based products (chemicals or food) and renewable energies (forest biomass). Except for bio-energy, these topics were hardly mentioned by the COST Action E51 experts as fields having a strong innovation focus in the countries.

*Diffusion is supported but there are hardly radical innovations*

The view within the sector is largely that in the forestry and forest-based industry, no radical innovations are thinkable. The example of the Lead Market Initiative, however, shows that these possibilities exist but that these tend to be discovered from outside of the sector rather than inside. The new uses of biomass from the forest were developed by actors outside the forest sector; the sector itself only picked up the idea later and supported its further diffusion. Bio-diversity conservation and recreation are new societal demands that were long, and often still are, defended by forestry actors instead of promoting their marketing. New topics such as green building or bio-chemicals are also initiated by actors from sectors other than the forest sector. This proves that, in general, forest and forest-sector innovation systems

are first of all concerned with traditional products and diffusion rather than promoting new ideas.

## 3. Do policies converge for the sustainable development of the sector?

Our analysis includes a number of indications that policies converge over time towards common goals and approaches in the support of innovation and sustainable development of the forest sector in Europe. At the same time, the cases on rural development, NFPs and forest-based industry show the limitations of effective coordination and the integration of common goals and concepts in different policy fields.

The impulses for convergent policies can be expected from supranational policy processes such as policy making at the EU, pan-European or international levels. Influential EU policies are, for instance, the EU Lisbon Strategy on innovation, the EU Sustainable Development Strategy, or the CAP, with its move towards integrated rural development. They have an influence on other policy fields and are interrelated themselves. In the field of forestry, international processes have a significant influence on national forest policies, e.g. by UNFF and former global policy processes as well as the MCPFE. The concept of NFPs was developed in an international context and has repercussions in European countries (see also Hogl et al. 2009). On a formal level, forest policies in Europe are relatively well coordinated with other sectors, among public bodies as well as with stakeholders. This is observed – again, formally – for NFPs as well as other types of policy documents, and, for Western and Eastern European countries (Weiss et al.). In spite of this observation, we should still be aware that informal practices and the implementation of the policies might significantly differ from formal provisions. National traditions and national-specific power-relations are certainly still the dominant factors in forest policy.

EU enlargement can be assumed to be one of the strongest drivers of policy convergence in European countries. The country reports, from new EU Member States (MS), report on the rapid changes in national policies in the course of the accession process. The COST Action E51 national representatives mentioned that the date of policy documents in relation to the accession process often explains the use of certain terms and formulations within the documents, as EU policies had a strong influence on the policies. Again, rhetoric is quicker than substance: Sarvasova et al. illustrate the example of the RDP and how policy measures do not follow at the same pace as policy goals. Such direct links of national policy documents to the European level also become visible in the analysis of forest and forest-based industry documents in several European countries: Niskanen et al. show how, after the creation of the FTP Vision 2030, policies are specifically related to this document. However, national priorities still shape the contents of public and private policies in the sector (Tykkä et al.).

In relation to the EU RDP, the detailed analysis by Sarvasova et al. describes the coordination aspects in temporal, vertical and horizontal dimensions. The six countries that were analysed include three old and three new Member States. During the accession period, three different policy documents regulated rural development measures. Instead of the SAPARD programme for the accession countries and the Rural Development Plans and Special Operational Programmes Agriculture and Rural Development for different territorial categories in EU countries, only one regulation for Rural Development Programmes is employed today. Still, the analysis shows large differences in the application of the new guidelines for the ongoing planning period of 2007-2013. There is much leeway for the MSs in the implementation, and this freedom in the vertical coordination processes is used extensively. Silvicultural activities are in most countries typically financed under Measure 122 “Improvement of the Economic Value of the Forests”, which aims at a stronger competitiveness of the sector, whereas

Germany, in contrast, finances silviculture under Measure 227 "Non-productive investments", which aims at the improvement of the landscape. While silviculture is in the first case seen as a business activity, Germany seems to interpret it more from an environmental perspective. The study concludes that national actors and institutions seem much stronger in the implementation of the rural development measures than the EU guidelines. The horizontal dimension is discussed by using the example of innovation support. Innovation-oriented measures are defined quite broadly, embracing all conceivable measures that could improve the economic value of forests, including traditional and innovative measures, and process and product innovations. Member States define their national priorities in light of this all-embracing scope. Slight differences exist in the formulation of different measures in the guidelines but the national interpretations even wash down these differences. All in all, the envisaged grand narrative of a reformed CAP – such as the move towards the support of integrated rural development instead of a mere sectoral support of agriculture – does not seem to be strongly evident. Sectoral goals are still strong and influential and, on top of that, national interests still have strong power in order to undermine policy goals from the higher EU level. Broad policy changes are not realised from one day to the other or, respectively, from one planning period to the other.

The diffusion of policy solutions or institutions in policies is specifically addressed by the example of the Forest-based Sector Technology Platform (FTP) in the sections by Niskanen et al. and Tykkä et al. The first paper aims to grasp, based on the study of six countries, how far new common policy patterns are diffused to national policies. Niskanen et al. look at the forestry and forest industry policies and assume that the FTP is a major process fuelling such policy diffusion. The FTP is seen as the guiding policy formation process for the sector on the European level and is analysed based on its Vision 2030 document, as well as the Strategic Research Agenda (SRA). The comparison of the Vision 2030 and the SRA with the national policy documents shows that the establishment of the FTP documents initiated a temporal and spatial cluster of policy reform in the fields of forestry and forest industry policy. The authors are rather surprised by the depth of diffusion as they observe five similarities: The major concern of forest and forest industry policies of Western European countries consistently seems to be a possible decline of international competitiveness. There is nonetheless a strong trust in the positive role of sustainable development in strengthening the competitiveness of the forest-based industry in the long run. Environmental issues and social demands are formulated in very similar ways. New forest-based business opportunities are seen in the fields of bio-energy, tourism, carbon sequestration, provision of water and amenity services. These similarities are especially pronounced in the forestry and forest industry policies of Austria, Finland, Norway and Sweden. However, the policies from Poland and Romania are much more related to traditional technological development, as the sector is not well developed yet in these countries. The key objectives of the SRA are well represented in the four Western European countries, and to some extent in Poland and Romania. The authors conclude that the policy diffusion was most likely caused by a process of transnational communication. More specifically, the diffusion may be related to "international policy promotion", furthered by the FTP Vision 2030 and SRA, as well as "lesson drawing" and "transnational problem solving", facilitated through a number of actors at both the national and international levels, such as the interest organisations of the sector. International regulatory means are of less significance in the sector but regulatory competition, in addition, might have also played a role in the diffusion process because national governments need to provide their industries with supportive legal and political frameworks, adjusted to the surrounding international conditions.

The second paper (Tykkä et al.) focuses on the formulation process and the content of the National Research Agendas (NRAs) that were

established by the National Support Groups of the FTP. The majority of the eleven NRAs that were included in the analysis follow the predefined structure of the Strategic Research Agenda (SRA) of the FTP and express a similar understanding and similar innovation-related goals. However, the specific topics do differ between countries and the promotion of the countries' industries is strongly adapted to their industrial structures. In sum, the NRAs are strongly predefined in their structure by the SRA, but their contents are strongly adapted to the industries' characteristics in the respective countries. This seems predicable but, at the same time, it poses the question of to what extent have new views on innovation support been transported through the FTP? The SRA aimed at broad innovation support and broad involvement of the stakeholders. They are an example of new collaborative governance in which a change from the top-down steering of sectors to a more participatory cooperation is expected. In fact, a high number of stakeholder organisations were involved in the creation of the NRAs, mostly however, only from the concerned forest-related sectors. Beyond the forestry and forest industry sectors, the agriculture and energy sectors were hardly involved in the formulation process. This reinforces observations that the forest sector, like other traditional industry sectors, is hardly open to the inclusion of wider interest groups, a factor that would be seen important for the support of innovation. It, therefore, seems that the FTP process has not necessarily brought about change towards more systemic approaches to innovation policy within the sector. The results of the analysis further indicate that innovation support measures rather rely on traditional instruments such as the public financing of R&D but not so much on human resources development or demand creation. When comparing the scores of the NRAs with the forest-based sector strategies (in the analysis by Weiss et al., which is based on the same questionnaire) it seems that the publicly formulated sector strategies are more inclined towards systemic approaches than the industry-led NRAs. This, however, might also be an implicit result of the different goals of the sector strategies and the NRAs, the latter specifically focusing on R&D. It may be concluded that the devolution of responsibilities to the private sector does not imply that the policy comes closer to the whole of society but rather only to one segment, in this case one industrial sector. It can further be assumed that the power play between interest groups is also found between sectors, for instance, that sub-sectors with few large companies are more successful in promoting their interests than such with many small firms.

Therefore, what we see from both cases – RDP and FTP – is, on the one hand, a convergence of topics and concepts across countries, which is partly due to direct supra-national regulation (EU policies) but also partly working through non-regulatory diffusion processes. The forest-based industry policies seem to be a case where the regulatory means are of less importance than learning across country borders. On the other hand, national priorities often overrule supra-national attempts at change, as can be seen in both cases, the RDP and the NRAs. In the case of the RDP, national and sectoral interests seem to be so strong that even regulatory instruments can hardly achieve their goals. In sum, it could be concluded that the coordination is often more symbolic than substantial and that interests of powerful groups effectively hinder policy changes and capture the 'rent' of public policy. Certainly, rhetoric converges much quicker than institutions change. The change of language, however, may indicate a change of the policy discourse: discourses have their own power and their change may be a first step in a long-term change of policy practices and power-relations.

## 4. Tensions between sectoral and territorial approaches to innovation policy: the example of territorial goods and services of forests

The enhanced provision of territorial goods and services in rural areas can be seen as a combined product of market-driven responses by the private sector, institutional action by

government, and the activities of third sector and hybrid bodies, which often seek to alter the framework conditions in a sector or region. The term 'territorial goods and services' describes the goods and services that embody place-specific qualities of rural spaces, thereby conferring a degree of distinctiveness and local or regional identity on those products and services. These place-specific qualities are a product of local physical geographies that create particular rural land use environments, manifested in the French idea of 'terroir', of locally embedded cultural traditions, particularly in food and crafts, and sometimes perhaps the inventiveness of those seeking to differentiate a commodity type product.

The emergence of territorial goods and services as important components of rural economies can be seen in part as a product of the changing social composition of rural areas, particularly through social change associated with commuting and home-working and the increased use of rural space for leisure and recreation. Whereas the old rural economic model revolved around a combination of self-sufficiency and the exploitation of the natural resource base for commodity exports from rural to urban areas, the new model is much more associated with an ingress of spending power and a resultant decommodification of markets and the development of new niche products and services to supply the needs of the in-migrant buying power. This can become an active ingredient in 'place making'.

*The slow emergence of rural development in European policy making*

The decommodification of rural product markets has not happened in a policy vacuum. For a long time after its initiation in the 1970s, rural development policy in the European Union was largely directed towards disadvantaged areas. These were defined by common criteria regarding the Gross Domestic Product. It has only been since the new millennium that European rural development policies have embraced all rural areas, although higher levels of support are still given to the most disadvantaged areas.

In addition to EU rural development thinking, a city-regional conception of territorial development has increasingly taken hold, stimulated in part by the OECD's new 'rural development paradigm' (OECD, 2006) with its emphasis on multi-sectoral territorial development, but more generally by the extension of urban hinterlands into more deeply rural areas by the expansion of transportation channels, relatively low costs of movement and massively improved information technology systems. Those in the Regional Policy Directorate in the European Commission have also articulated strong interest in this city-region concept. The OECD has also stressed the importance of developing new markets from environmental goods and services (OECD, 1999), often in the form of tourism and recreational products. This is an arena ripe for institutional innovation, building new policy linkages and often requiring the internalisation of externalities through new policy means.

Over the last two decades, the old structures of the Common Agricultural Policy (CAP) have been progressively modified, largely under pressure from an internal budgetary crisis in the European Union combined with external pressures from the World Trade Organisation to liberalise trade and reduce European agricultural protection. Rural development has emerged as the second pillar of a reformed Common Agricultural Policy. It has long been the poor relation of the first pillar that comprises the now decoupled production subsidies to farmers (the Single Farm Payment), but it has slowly grown in importance, taking up approx. 18.5% of the CAP budget in the 2000-2006 funding period (Dwyer, 2005). In its latest form, it is structured under four axes: the first dealing with competitiveness, the second environment, the third quality of life and rural diversification and the fourth conceived as a cross-cutting axis on building local capacity, Liaisons

Entre Actions pour le Developpement d'Economie Rurale (LEADER), which was previously a Community Initiative, and is now mainstreamed.

The level of funding of the second pillar of the CAP is vastly different from one EU member state to another (Royal Society of Edinburgh, 2008), with expenditure allocations ranging from approx. £248 (€285) per ha of Utilisable Agricultural Area in Finland to £206 (€237) per ha in Austria, to £57 (€66) per ha in Germany and £22 (€25) per ha in Scotland over the period 2000 to 2006. These figures are a function of historic allocations between the so-called first pillar and the second rural development pillar and create a highly uneven playing field in terms of funding. They reflect a stronger commitment to territorial as distinct from sectoral rural development in some countries and massively limit the available funding for rural development projects in others.

Rural development policies are not articulated in isolation from other areas of policy. In the last decade, there has been a proliferation of sectoral and cross-sectoral policy strategy initiatives, some triggered by European obligations, others from a still higher level, such as Sustainable Development Strategies in response to the Rio Earth Summit, and still more as part of the architecture of national policy. Given the growing recognition of the role of innovation in economic growth, it is not surprising that strategic documents make reference to innovation as a means of achieving wider aims.

*Innovation rhetoric between territorial and sectoral goals*

The evidence presented by Weiss et al. in Chapter V of this book, indicates the variable extent to which innovation thinking is evident in national strategy documents. What is less certain is whether the rhetoric of innovation in such policies is matched by action by public, private and voluntary sectors on the ground. Cross-sectoral and cross-strategy co-ordination may be needed, and may be essential where territorial goods and services are the object of attention. Tourism, biodiversity and renewable energy, to name but three examples, necessarily intersect with the forest sector in practice. Rural development policy should have a central co-ordinating role. However, a cursory analysis at the national level (see Slee et al. 2009) reveals a distinct lack of joined up policies and a tendency towards 'silos' of policy. This has long been known for the forestry sector (Glück, 1987) and according to the work in the COST Action E51 it is also true for the forest industry sector (Tykkä et al.). If policy structures cannot be integrated, there is little hope for a consistent view of how innovation policy can be better embedded in those policies.

Innovation in territorial goods and services can take many forms. It can comprise product, process or marketing innovations, or innovations in institutional structures. It is the latter area that has received particular attention through the transformation of the CAP and the deepening of the second pillar relating to rural development. The precise definition of innovation is often problematic in the academic literature and has proven equally difficult to assess in programme evaluation. What may be new in one locale may be long-standing in another region. Often innovations are not so much novel products as 'new–old' reincarnations of former locality products, new processes that retain traditional product distinctiveness but improve production efficiency, new market developments or new policy means. This type of development process has been termed 'neo-endogenous rural development' by Ray (2006) and may be particularly important in developing new territorially based enterprises with markets for tourists or in-migrant or commuting populations.

*Forestry remains traditional*

Forestry has been modestly included in the guidance part of the CAP since the late 1980s when production surpluses of farm products led to measures to take farmland out of production. These measures have tended to persist since that time; and increasingly new

rationales such as carbon sequestration in turn drive the continuation of such policies. However, in the last two funding periods since 2000, forestry measures have been much more effectively embedded in the policy framework.

As is shown in the chapter by Sarvašová et al. in this volume, measures within the RDP that relate to forestry are rather often traditional and not highly innovative. Certainly in some countries, this represents little more than a repackaging of national forestry measures under a new territorial framework. In practice, of course, the framework is still not essentially territorial. After the liberating experience of strongly inter-sectoral and explicitly territorial measures of the EU's Objective 1 and 5b support schemes in the 1990s, when Guidance Funds (now Pillar 2) were integrated with Regional Development Fund and Social Fund measures, the new millennium witnessed a retrenchment of support back into the rural land-based sector. Rural development policy is not really targeted at the rural economy as a whole, but rather at the rural land use sub-component of the rural economy.

*LEADER as an innovative policy approach to bridge territorial and sectoral approaches*

How far has innovation been embedded in rural development policy in the last decade? Most evidence suggests that active innovation in policy design in the early 1990s with the integrated development of rural areas being addressed through innovative combinations of funds and more especially by the emergence of the LEADER initiative. LEADER was identified by many commentators as an exciting innovation with its explicit advocacy of local territorial public-private partnership as a vehicle for supporting development in less favoured areas, which had been left behind and marginalised by the normal processes of economic growth. It was also innovative in that it was seen as a vehicle not so much for supporting market-based developments but for supporting the social and cultural sectors, with the implication that such an investment would ultimately feed through to economic outcomes. In practice, LEADER can be seen as a means of strengthening local capacity and delivering new forms of governance. In the early years, LEADER Local Action Groups stood outside the normal structures of local government. This radicalism was also stifled over time as municipal authorities resented the rather flexible development support regimes that LEADER offered and made sure, in subsequent rounds of funding, that LEADER was 'tamed' and brought more firmly under traditional public sector control.

*Innovations in territorial goods and services need innovative policies that enable endogenous innovation processes*

In many ways, the co-ordination of policy, let alone policy for innovation is bound to be more problematic in the non-wood products sector than in timber processing. Territorial goods and services often have public good characteristics. They demand public intervention to ensure their optimal delivery. This can lead to innovation in policy means, but that innovation is often in the form of local coalitions and partnerships, rather than the result of top-down strategic frameworks. This comprises a more endogenous type of innovation than that engendered by strategic policy documents (though such documents could create the enabling means). As well as public goods, there may also be opportunities for market based territorial goods and services.

There is little doubt that regional identity will increasingly be used as a means of product differentiation. There is little doubt too, that place specificity can be enhanced by place-making policies. The role of the European Union in developing protection through protected origin foodstuffs is a clear example of this at work. Innovation policies clearly intersect with such initiatives, often implicitly rather than explicitly and often indirectly rather than directly.

Teasing out the extent to which innovation policy is embedded in other policy strategies is a challenge. In relation to territorial goods and services, it is entirely appropriate to assign a

central role to innovation in enhancing the role of territorial goods and services in rural development. What is less certain is whether this emerges from national strategies or is more a product of endogenous local responses and the emergence of place-specific partnerships, which recognise local distinctiveness, not just in terms of products to sell, but also in configuring the local constellations of actors and partnerships on which such development strategies are built. The purpose of COST Action E51 is to better understand how innovation policy can better connect to other policies and to the development platforms in which innovation necessarily takes place, thereby getting to the core of understanding as to how innovation occurs in relation to territorial goods and services.

## 5. European policies and the need for regional/local innovation infrastructure for rural SMEs: the example of wood value chains

Innovation is a core characteristic behind the competitiveness of enterprises and industries in knowledge-based economies. Innovations and the knowledge base behind these are among the key managerial issues, including the traditional industries and their associated clusters and networks. It is becoming increasingly important for public-sector organisations to systematically develop the knowledge services that are necessary for companies in traditional industries, especially for SMEs. New knowledge is necessary to create new products, processes and services as well as organisational and marketing solutions through innovation processes (Oslo Manual, 2005). The knowledge necessary for innovating enterprises covers a variety of disciplines. The majority of traditional enterprises cannot afford to develop that knowledge in-house. Temporary knowledge services are especially relevant for SMEs in their innovation processes and these services are not always offered by private consulters or affordable for small companies, which is why public institutions increasingly need to step in. (Innovation tomorrow, 2002)

*Policies have noticed innovativeness among traditional industries as an issue but small and medium-sized firms need specific policy approaches*

The fast internationalisation among traditional industries and related business has weakened and challenged their specific competitive advantages during the last two decades. Policy goals referring to innovation options and activities can be found in a wide range of policy documents. Enterprises in traditional industries conducting innovation processes tend to achieve higher than average shareholder returns and market valuations. This may be an explanation for the European Commission's efforts to promote innovativeness in traditional industries. Innovativeness, adopted as a cross-cutting policy objective in the European industrial policy, means challenges for the traditional industries to fully use the options to improve their competitiveness (Communication on Industrial Policy in an enlarged Europe, COM 2002). Industry-wide technology platforms have been created by industry stakeholders to mobilise Europe's research, technological development and innovation efforts. The European Confederation of Woodworking Industries (CEI-Bois), the Confederation of European Forest Owners (CEPF) and the Confederation of European Paper Industries (CEPI) initiated a process to establish a technology platform for the forest-based sector (FTP) in 2004. The Strategic Research Agenda (SRA) of FTP is aimed to support the wood-based value network in their further development. The National Research Agendas (NRAs) are the instruments to implement the SRA on national level. These NRAs, now available from 17 countries, transfer the SRA objectives for forest-based sector development in each participating country for their specific circumstances and needs in the country. NRAs aim to promote new technology implementation and thus complement relevant national policy documents to become more concrete. NRAs are forest sector specific research support activities (EC Innovation papers no. 28). The COST Action E51 action, particularly focusing on the policy coordination in order to foster innovation activities, discusses how far and in which ways the

NRAs address innovation activities as policy objectives and how their formulation addresses different public and private actors.

COST Action E51 research findings from forest-based value chains support findings from other studies of traditional industry sectors in Europe as far as what concerns competitive advantages: Their strengths compared to multinationals are (a) product differentiation, (b) successful specialisation to niche markets and (c) product innovations inside successful value chain architectures. Individual enterprises tend to benefit from the current regional and local value networks but need new innovative marketing solutions to make new and current products and services visible and available in the EU markets. By implementing the SRA of the FTP, the NRAs increase the innovativeness and competitiveness of the forest-based sector by fostering cooperation via joint projects between universities, research institutes, industry and other commercial actors. The eleven NRAs consider – according to the COST Action E51 findings – innovations mostly as narrow technological innovations in industrial companies to develop new products for the markets through traditional R&D processes. According to the text analyses, the NRAs hardly address the importance of using embedded local technology knowledge and investing in having a presence on local customer markets. The latter have traditionally provided major business advantages among SMEs, thereby providing a counterforce to the cost leadership of their multinational competitors.

*Policy actions to improve innovation infrastructures are needed in addition to direct innovation project financing*

Innovation activities among SMEs in traditional industry and service enterprises are not performed in isolation, but rather through cooperation with other enterprises and Knowledge Intensive Business Service (KIBS) providers (Rametsteiner, 2000). There are – according to COST Action E51 research findings – benefits from policy diffusion through (a) international harmonisation and mutual policy adjustment among different countries facing similar competitive pressures, (b) learning by interacting from experience in other countries in order to deal with domestic problems, and (c) transnational problem-solving with joint development of common solutions to similar domestic problems and their subsequent adoption on national level (Tykkä et al.).

The creation of the Technology Platforms and related SRAs towards nation-specific NRAs reflects the European and national level tendency towards a new governance approach that delegates public sector tasks on the EU level to the private sector. This new institutional arrangement is considered to provide a way out of hierarchical co-ordination (Arts and v Tatenhove, 2004). The policy targets of FTP through its SRA and corresponding NRAs favour radical innovation targets in the policy objectives addressed. The eleven NRAs analysed by Tykkä et al. do not rely on a systemic innovation approach. The majority of these NRAs tend to follow identical patterns, giving only little support to the forestry chain in product and process objectives but more with regards to wood-based industries, pulp and paper, and bio-energy. The documents are mostly concerned with traditional innovation support goals and lack the engagement of different stakeholders from the public and private sectors.

The inefficient use of new knowledge among SME managers, which is identified frequently as incomplete KIBS use, has turned out to be a transnational feature that concerns wood-related value chains (Arnold and Thuriaux, 1997). The KIBS supply can be arranged through regional and rural policy implementation and thereby provide channels to traditional industry SMEs to learn from experience in other countries. Together with systemic support in the recent innovation policy, they would strengthen public-private partnerships and collaboration between firms and external partners in the research sector. Policy formulations concerning cross-sectoral interaction and co-operation are desirable to open up the frequent lock-in situations in mature industries.

The promotion of KIBS supply in cluster formation and development support is discussed in the third paper (Ollonqvist and Rimmler). KIBS providers constitute links between the knowledge creation proceeded through technology platforms and network-facilitating policy implementation tools in European innovation policy (Reid and Peter, 2008). Innovation policy favouring cluster-based (macro, meso or micro cluster) national implementation can be identified in the background of cluster specified centres of expertise, science parks but also regional development agencies (Boekholt and Thuriaux, 1999). The three modes of clusters can provide supportive innovation environments through functional, social and geographical proximities. However, they do not share the same sectoral and regional system support. Regional and local innovation system support is important for SMEs calling for coordinated innovation system support. Traditional SMEs primarily learn by interactions with actors at the same location. Knowledge that is relevant for them is typically non-codified and transferred by face-to-face communication.

*Transnational learning could improve policy coordination in innovation processes*

Forest and forest industry policies encouraging public-private partnerships towards the better coordination of R&D efforts and subsidised capital supply for investments into new business innovations match with the specific needs among the innovation processes of forest sector SMEs (Finland and Sweden in the chapter by Niskanen et al.). Policies that accentuate direct technology imports indirectly favour the joint development of common solutions with international partners (Poland and Romania in the mentioned analysis). The innovation processes, benefiting from transnational learning through interacting activities that transmit experience from other countries, tend to postpone domestic efforts to implement problem-solving approaches in the enterprises. The latter concern the supply modes and extensions in KIBS services. They can provide traditional industry SME manager's high-tech knowledge transition through the intake of imported machines, technologies and best practice solutions. Research related to innovation activities tends to move from the national policy system level nowadays to increasingly cover issues of innovative milieus and institutions that support the emergence of regional value chains and networks. Sectoral and regional innovation systems have qualified as factors that can both impede and support innovations. National and international linkages are, however, still significant for innovation policy parallel with the more local networks (Simmie, 2004). Leading innovators also rank quite highly certain sources of knowledge that are not associated with space. These include specialised standards such as technical, health and safety, and environmental standards and regulations, which are usually set by government and industry bodies (Simmie, 2004).

The COST Action E51 findings address policy stakeholders to put forth more effort to coordinate SME relevant innovation support. There coexist micro and small enterprises in the European forest sector regional and local clusters. There are region-specific needs to tailor systems that can enhance innovation processes among micro and small enterprises. The identification of these needs is a specific challenge for policy integration.

## 6. Summary needs for policy improvements

For a better integration of innovation into forest related development policies, the awareness for the importance of integrated innovation for a sustainable development of the sector is necessary. Systemic innovation support should be strengthened and further developed. Systemic measures would include the development of innovation infrastructure on the local-regional level and the support of bottom-up initiatives. They would further actively initiate cross-sectoral interaction for the benefit of both innovation fields: in territorial goods and services, and in wood value chains. In order to support innovation in territorial goods and services, specific policies are needed, among others, because of the

often-found public good characteristics. Policies need to support local networks and partnerships that develop and implement innovation. In addition, wood value chains need specific policy measures that recognise the sectoral characteristics and specific needs of SMEs.

## 7. References

Arnold, E. and Thuriaux, P. (1997). Developing Firms' Technological Capabilities. Report to OECD, Brighton: Technopolis, 1997.

Arthur, W.B. (1989) Competing technologies, increasing returns and lock-ins by historical events. The Economic Journal, 99, 116-131.

Arts, B. and v Tatenhove, J. (2004) Policy and power — a conceptual framework between the 'old' and 'new' policy idioms. Policy Science, 37, 339–356.

Boekholt, P. and Thuriaux, P. (1999) Public Policies to Facilitate Clusters: Background, Rationale and Policy Practices in International Perspective. In Boosting Innovation: The Cluster Approach 1999 OECD Proceedings. Paris.

Communication on Industrial Policy in an enlarged Europe, COM 2002 Commission Communication of 11 December 2002 on industrial policy in an enlarged Europe. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2002:0714:FIN:EN:PDF

Dwyer, J., (2005) Rural Development under the CAP: significance, likely impacts and modelling issues, JRC workshop, Italy, 27 September 2005

Glück, P. (1987) Das Wertsystem der Forstleute. Centralblatt für das gesamte Forstwesen 104, 1, 44-51.

Hogl, K; Nordbeck, R; and Kvarda, E. (2009) When international impulses hit home: The role of domestic policy subsystem configurations in explaining different types of sustainability strategies. Forest Policy and Economics, 11, 357-364.

Innovation tomorrow (2002) Innovation policy and the regulatory framework: Making innovation an integral part of the broader structural agenda. Innovation papers No 28. A publication from the Innovation/SMEs programme part of the Fifth Research Framework Programme. DG Enterprise. ftp://ftp.cordis.lu/pub/innovation-policy/studies/studies_innovation_tomorow.pdf

OECD (1999) Cultivating rural amenities: an economic development perspective, OECD, Paris.

OECD (2006) The new rural paradigm: policies and governance, OECD, Paris.

Oslo Manual (2005) Guidelines for Collecting and Interpreting Innovation Data. 3rd Edition A Joint Publication of OECD and Eurostat http://www.oecd.org/document/23/0,2340,de_2649_201185_35595607_1_1_1_1,00.html

Rametsteiner, E. (2000) Innovation and entrepreneurship research in forestry: Definitions, key questions and measurement approaches used for the EFI Regional Project Centre INNOFORCE.

Rametsteiner, E., Kubeczko, K. and Weiss, G. (2005). Innovation and Entrepreneurship in Forestry in Central Europe. Leiden, Brill.

Ray, C. (2006) Neo-endogenous rural development in the EU. In Cloke, P., Marsden, T. and Mooney P.H., Handbook of Rural Studies, Sage London.

Royal Society of Edinburgh (2008) The future of the Scotland's Hills and Islands, RSE: Edinburgh

Salvatore, D. (2007) The US challenge of European firms: globalization, architecture, admiration and perceived innovativeness. European Journal of International Management, 1, 69-80.

Simmie, J. (2004) Innovation and Clustering in the Globalised International Economy. Urban Studies, 41, 1095.

Slee, B. et al. (2009) Realising the contribution of rural land use to sustainable economic growth. Report to the Scottish Government.
http://www.scotland.gov.uk/Publications/2009/11/05143048/1

# List of Abbreviations

| | |
|---|---|
| **CA** | Competitive Advantage |
| **CAP** | Common Agricultural Policy |
| **CEI-Bois** | European Confederation of Woodworking Industries |
| **CEPF** | Confederation of European Forest Owners |
| **CEPI** | Confederation of European Paper Industries |
| **COST** | European Cooperation in Science and Technology |
| **DUI** | Doing, Using, Interacting |
| **EAFRD** | European Agricultural Fund for Rural Development |
| **EFRD** | European Fund for Regional Development |
| **EPI** | Environmental Policy Integration |
| **EU** | European Union |
| **FNFP** | Finnish National Forest Program |
| **FP7** | EU 7th Framework Programme for Research |
| **FTP** | Forest-based Sector Technology Platform |
| **GDP** | Gross Domestic Product |
| **ICT** | Information and Communication Technology |
| **IPR** | Intellectual Property Rights |
| **KIBS** | Knowledge Intensive Business Services |
| **LEADER** | Liaisons Entre Actions pour le Developpement d'Economie Rurale |
| **MAP** | Multi Activity Programme |
| **MCPFE** | The Ministerial Conference on the Protection of Forests in Europe |
| **MS** | Member State |
| **NFP** | National Forest Programme |
| **NIS** | National Innovation System |
| **NRA** | National Research Agenda |
| **NRP** | National Reform Programme |
| **NSG** | National Support Group |
| **OECD** | Organisation for Economic Co-operation and Development |
| **R&D** | Research and Development |
| **RDP** | Rural Development Policy |
| **RIS** | Regional Innovation System |
| **RTD** | Research and Technology Development |
| **S&T** | Science and Technology |
| **SAPARD** | Special Pre-accession Assistance for Agriculture and Rural Development |
| **SME** | Small and Medium-sized Enterprise |
| **SRA** | Strategic Research Agenda |
| **STI** | Science, Technology and Innovation |
| **UNFF** | United Nations Forum on Forests |

# Annexes

## Annex 1: Guidelines for country reports.

Data collection guidelines and data collection templates for the country reports of COST Action E51.

### 1. Introduction

#### *1.1 Background and objective*

The following document aims at guiding the document analysis and data collection in the first phase of the COST Action E51 "Integrating Innovation and Development Policies for the Forest Sector". The Cost Action runs from March 2006 until March 2010 and aims at developing knowledge that enables the integration of innovation and development policies for a more effective and sustainable development of the forest sector.

In the first phase, running from October 2006-September 2007, the participants will study the integration of innovation in different policy areas and their effects on innovation in the forest sector. The two tasks in the first phase are:

Task 1: Analysis of existing EU as well as national strategies and programmes and their implementation mechanisms on: innovation, rural development, regional development and sustainable development policies, and

Task 2: Appraisal of effects of these programmes on forestry and forest sector enterprises.

The guidelines for document analysis in phase I consist of three parts (Part A, Part B, Part C) covering tasks 1 'Analysis of relevant programmes and their implementation' and task 2 'Analysis of effects' of the Scientific Programme. The following figure sketches the structure of the guidelines.

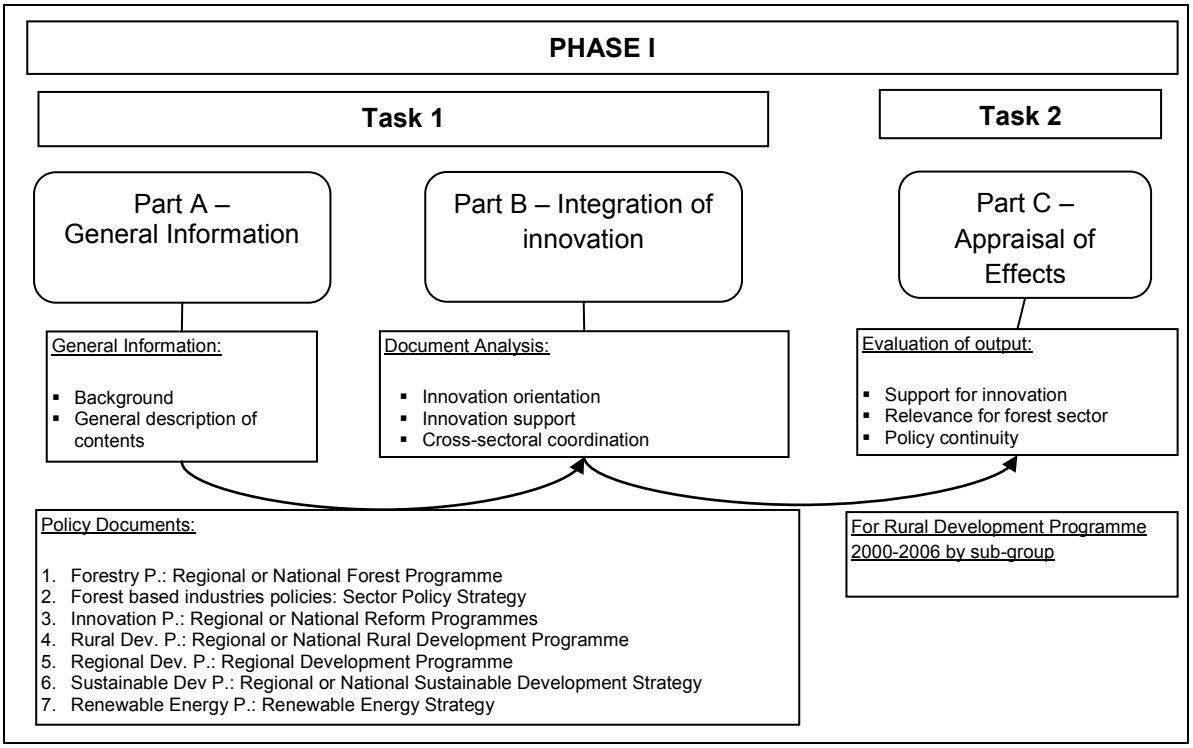


**Figure 1**. Structure of guidelines for phase 1

Altogether seven policy areas and respectively seven key policy documents (see Figure 1) will be analysed. In 'Part A' a short overall description of the concerned policy documents will be given. In 'Part B' the concerned policy documents will be analysed along the questions how innovation is integrated, how forestry or the forest sector is integrated and how cross-sectoral coordination takes place. In 'Part C' the effects of policy will be appraised on the basis of existing monitoring data and evaluation reports.

***This document provides guidelines and data collection templates (tables) to facilitate the collection of information. For each policy area all tables covering Part A and Part B should be filled in separately. Part C is only valid for the analysis of the Rural Development Programme 2000-2006 (by a sub-group of the COST Action).***

The guidelines serve to prepare the Country Reports and to facilitate work in the second phase of the Action.

The country reports will be further used in the following ways:

- **Online publication**: all country reports will be published on the COST Action E51 website (www.boku.ac.at/coste51);
- **Cross-country comparison**: A number of cross-country comparisons on particular aspects will be jointly conducted by small teams, according to the interest and preferences of participants.
- **Joint journal articles**: On the basis of the country comparison, several joint publications (journal articles) will be compiled by individual teams.
- **Research questions for phase 2**: During the compilation of country reports and the country comparison participants will identify research needs which could be pursued in the second phase of the Action.

### *1.2 Guidelines for compiling country reports and timetable*

Compiling the country reports is done in two steps. First, participants will contribute to chapter 3 of the guidelines, i.e. identify important innovation areas in their countries and search and select the documents they will analyse in the further course of the first phase. Participants were asked to submit chapter 3 by end November. Those participants who have not submitted the chapter are asked to do so as soon as possible (ewald.rametsteiner@boku.ac.at, anja.bauer@boku.ac.at). This first step serves as an important basis for the further analysis. The second step will be the analysis of the documents in chapter 4 (Part A and Part B, Part C for a sub-group). This work will be done from January to April 2007.

Chapter 5 provides an outline of the structure of the country report. The country reports consist of the input to chapter 3 as well as all filled in tables (Part A and B) for the seven concerned policy areas.

The Management Committee (MC) members are in a key role in preparing the Country Reports. It is in their responsibility to secure that the Country Reports are prepared according to the agreed guidelines and that they are as comprehensive as possible. MC members will distribute responsibilities and allocate the work to collect information and compile the country report or will designate a responsible person in their respective country.

The following points have to be taken into account while compiling the Country Reports:

- If any of the required information is not available, please indicate: "n.a."
- The latest available documents and information should be used
- Whenever possible use word search function for analysing the document

- The country report should be understandable without a need to consult further sources,
- Research reports, literature or other sources of information should be reported whenever possible,
- Whenever there are uncertainties or double-meanings when filling in answers, use the comments sections to explain why you have chosen a particular category or statement,
- Wherever possible, individual judgements of experts should be cross-checked by other participants from your country. This is particularly relevant for chapter 3.1, where the baseline of the current forest sector "innovation frontier" is established for a country.

### *1.3 Timetable*

The following table presents the time schedule for compiling the Country Reports.

**Table 1**. Timetable for compiling country reports

| | |
|---|---|
| Draft guidelines for phase 1 ready | October 2006 |
| Discussion of draft guidelines at 1st meeting | October 2006 |
| Discussion of draft guidelines at 3rd SG meeting | 2 November 2006 |
| Draft final version of guidelines to MC members | Mid-November 2006 |
| Working Group meeting – Final guideline specification and joint analysis | 5th -6th December 2006 |
| Final drafts of the country reports | April 2007 |
| Presentation and discussion of draft country reports at 2nd meeting | May 2007 |
| Final drafts to editorial board | June 2007 |
| Annotated drafts from the editorial board to authors | August 2007 |
| Country reports ready | September 2007 |
| Country reports published on-line | October 2007 |

## 2. Definitions and Operationalisation

### *2.1 Innovation*

In the 1st Joint WG and MC meeting the participants agreed to use the OECD definition of innovation as the reference definition for the work within the COST Action. The OECD (2005) defines innovation in its Oslo Manual[12] as "*[…] the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations*."

The minimum requirement for an innovation is that the product, process, marketing method or organisational method must be *new* (or *significantly improved*) to *the firm*. This includes products, processes and methods that firms are the first to develop and those that have been adopted from other firms or organisations (OECD 2005). Besides being new to the firm innovations may be new to a country or new to the world.

A common feature of an innovation is that it must have been *implemented*. A new or improved product is implemented when it is introduced on the market or when it is taken into use by customers.[13] New processes, marketing methods or organisational methods are implemented when they are brought into actual use in the firm's operations (OECD 2005). In addition to the

[12] Source: OECD 2005: Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, 3rd Edition.

[13] This includes also innovations in public goods that are not marketed goods and services. Further it includes such goods and services that are offered by for example public entities, are used but are not paid for by consumers. For example mountain bike routes in some countries are paid for in others they are offered for free.

definition by the OECD we will also include institutional innovations in our classification of innovation to cover important changes on the organizational level, changes in laws and policies, etc.

*2.1.1 Innovation types: classification*

The Oslo Manual distinguishes four main types of innovation – product, process, marketing and organisational innovations – which are further sub-divided (see Figure 2). We further add institutional innovation as a separate category.

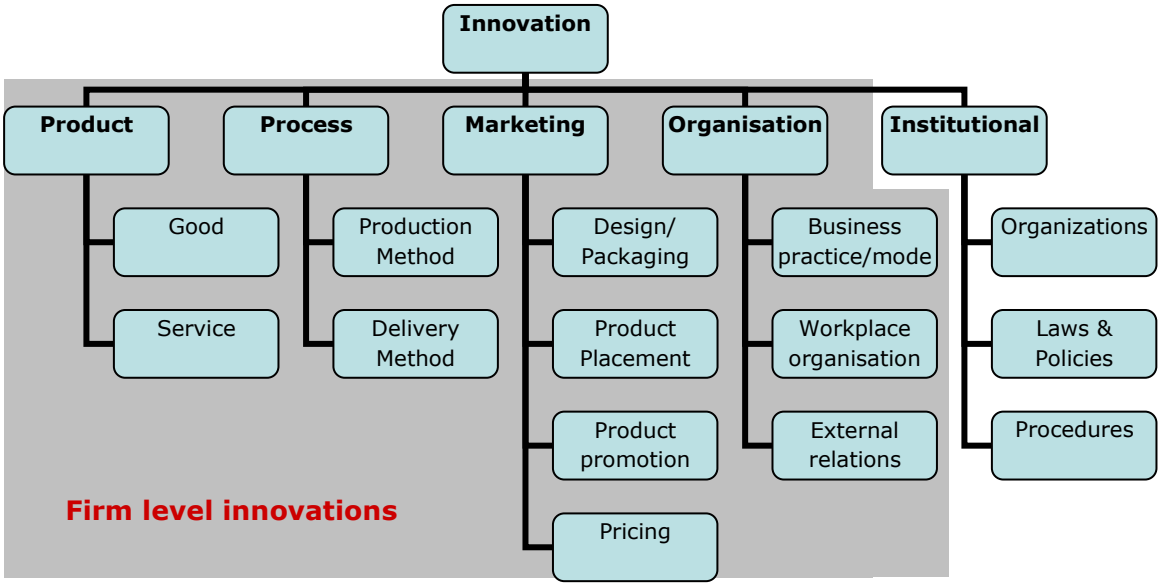


**Figure 2**. Typology of Innovation – modified from OECD 2005

A **product innovation**[14] is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics.

A **process innovation** is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software.

A **marketing innovation** is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.

An **organisational innovation** is the implementation of a new organisational method in the firm's *business practices*, workplace organisation or external relations. An organisational innovation is the result of strategic decisions taken by management.

Organisational innovations in business practices involve the implementation of new methods for organising routines and procedures for the conduct of work. Innovations in *workplace organisation* involve the implementation of new methods for distributing responsibilities and decision making among employees for the division of work within and between firm activities (and organisational units), as well as new concepts for the structuring of activities, such as the integration of different business activities. New organisational methods in a firm's *external relations* involve the

[14] More detailed specifications of these definitions can be downloaded from the Intranet of the COST Action E51- website: http://www.boku.ac.at/coste51.

implementation of new ways of organising relations with other firms or public institutions, such as the establishment of new types of collaborations with research organisations or customers, new methods of integration with suppliers, and the outsourcing or subcontracting for the first time of business activities. As business model innovation is not an explicit category in the OECD definition and classification, it should be included under this category.

Besides the above classified types of innovation that refer to innovations on a firm level, the concept of **institutional innovations** is of increasing relevance when analysing policies and institutions. Institutions are understood here to denote "the rules of the game". Institutional innovations refer to innovations in the public/policy sphere. Institutional innovations may include new or adaptation of existing organizations, new or significantly modified rules as laid down in laws, decrees or policies as well as new or significantly modified procedures in developing and implementing policies.

### *2.2 Innovation policy and innovation support*

#### *2.2.1 Innovation policy approaches: classification*

The understanding of innovation policy has considerably changed over the last decades and varies from country to country. The two dominating approaches are the traditional Science and Technology policy approach as it was prevailing in most OECD countries in the post war period and the systemic innovation policy approach that has gained increasing importance during the last two decades.

1. **Traditional S&T policy approach**: The traditional Science and Technology policy approach is ideal typically characterised by the following elements:
   - o A basic understanding of innovation processes as being linear, starting with laboratory science and moving through successive stages until new knowledge is built into commercial applications that diffuse in economic systems.
   - o Innovation is seen as the end of research and development processes (solely).
   - o Policy focuses on fostering critical directions of scientific and technological advance, and enhancing the flow of knowledge down along the innovation chain (Lengrand et al. (2002)).
   - o There is a distinct role for education/university ministries and economy/industry ministries dealing with innovation as a tool for encouraging investment and modernizing firms.
   - o Main policy instruments include:
     - public financing of research in universities and public research institutions,
     - subsidies to industrial R&D, and
     - securing intellectual property rights through more embracing and enforceable patents.

2. **Systemic innovation policy approach** is ideal typically characterised by the following elements:
   - o Understanding of innovation as a complex process, taking place in an environment of interacting actors and institutions (innovation system); having multiple sources (apart from research activities); and running through multiple feedback loops between the different stages.
   - o Policy approaches the systemic environment in which innovation take place in ways that can better inform decisions about research, commercialisation, technology adoption and implementation, etc.

- The role of policy is to solve problems that occur within innovation systems, e.g. by supporting the creation and development of institutions and organisations, supporting network development, facilitate transition and avoid lock-in (Edquist and Johnson 1997).
- Policy instruments are not only directed to individual organisations (e.g. research and development subsidies, management support) or bilateral relations (e.g. knowledge transfer), but also to the innovation system as a whole (e.g. managing interfaces and organising learning platforms) (Goorden 2004).
- The scope, scale and actors of innovation policy are widened. Innovation policy is no longer limited to the economic domain but is placed on the agenda of various policy domains, such as industrial policy, policies for science and technology, education, health, ICT and other sectoral policies.

In reality different mixes of the two policy approaches will be observable within one and the same country's ministries, where some rely mostly on the traditional approach while others may have changed their policy and institutions according to the systemic innovation policy approach.

For the analysis within COST Action E51, each of the documents should summarily be assessed in how far the document, in its innovation related parts, reflects the thinking and spirit of the more traditional science & technology policy or the more systemic innovation policy approach. The result of this assessment should be expressed qualitatively, using the characteristics as described above as indicators.

*2.2.2 Innovation support: classification*

Innovation support can take many forms from direct funding of research and development activities to the support of the diffusion of innovations, to improving the knowledge base and interaction of actors, to adapting framework conditions. Some of these support measures are targeted directly at fostering concrete innovation activities, others are of structural character. These measures may be introduced without the explicit aim of fostering innovation. For the analysis of the documents measures along the following six categories of 'innovation support' will be distinguished:

1. **Research and Development**: This includes innovation support in a narrower sense, i.e. financing of basic and applied research, development of new products or processes, pilot projects, demonstration projects and support for the commercialization of innovations. Support for Research and Development generally aims at innovations new to the sector (forest sector), i.e. products, processes, marketing and organisational methods that have not been introduced to a particular sector in a particular country before. Throughout the document analysis the following sub-categories of Research and Development will be applied:
   - Enterprise research, i.e. support for applied research in the enterprise or in cooperation of enterprise and science organisations,
   - Development of new products, processes, marketing methods, organisational models by enterprises,
   - Pilot projects and demonstration projects,
   - Commercialization of new products by enterprises.

2. **Diffusion of innovation**: This includes support for the early and broad adoption of named, already known goods, services and processes by enterprises in a sector in a specific country. It excludes support to standard managerial processes or late adoption (e.g. species diversity support or road building in forestry or standard IT in SMEs). Throughout the document analysis the following sub-categories of diffusion support will be applied:

- Diffusion of products (for example subsidies for bio-energy installations; support of the introduction of recreational facilities),
- Diffusion of processes (for examples investment support for the acquisition of significantly new machineries/technologies, incl. advanced information technology for production or logistics, etc.),
- Diffusion of marketing methods (e.g. addressing new customer groups, market segments),
- Diffusion of organisational models (e.g. financial or informational support for the establishment of co-operations).

3. **Strengthening the knowledge base**: The innovation capabilities of a firm, a sector or an economy among others strongly depend on the availability and quality of human capital, i.e. individual know-how, skills and motivation of entrepreneur and employers, level of qualification and competencies of employers. Further, the access to and exchange of information and knowledge influences the innovation propensity as well. The following activities are examples of how to strengthen the knowledge base for innovation:
   - Integrating innovation in education, e.g. new educational curricula,
   - Strengthening further/vocational training,
   - Addressing shortages of scientists and engineers in particular fields,
   - Integrating innovation in extension services,
   - Promoting mobility of high-skilled personnel,
   - Promoting mobility between science and practice.

4. **Promoting interaction/ managing interfaces**: Firms do not innovate in isolation. Rather a range of other actors/ organizations contribute in different ways to innovations, e.g. other firms/competitors, research organisations, extension services, interest groups, etc.. Policy may foster innovation by strengthening the interaction between different key actors in the forest sector, among others through:
   - Promoting horizontal co-operation – between forest holdings,
   - Promoting vertical co-operation – along the forestry wood chain,
   - Promoting public – private partnerships,
   - Promoting cooperation across sectors,
   - Promoting university/research institutions – enterprise cooperation,
   - Promoting interaction with users (customers and consumers).

5. **Public demand creation for innovation**: The demand side is crucially important for the promotion of innovations. Policy may not only promote innovations by supporting the input – side but also by inducing demand for innovation. This is often applied in the case of environmental/sustainable innovations. The following activities may be implemented to strengthen the demand for innovation:
   - Reorientation of public procurement policy (creating consumer demand),
   - Support for lead users, or public agencies acting as lead user,
   - Clear demand expression through communication.

6. **Improving frame conditions**: General framework conditions including institutions such as laws, regulations, standards, taxes or the access to financing have a crucial influence on firms' decisions to innovate. Changing framework conditions is often not in the responsibility of sectoral policies. The following list comprises a selection of policy activities to improve framework conditions for innovation:
   - Institutional reforms, e.g. change of forest law, property rights reform, support for the establishment of new organisations,
   - Adaptation of tax laws, e.g. corporate taxes,

- Improving access to financing, e.g. by providing guarantees,
- Adaptation of standards and norms, e.g. in the construction sector.

### *2.3 Policy co-ordination*

Besides the integration of innovation in different policies the COST Action aims at analysing the co-ordination of different policy areas and different sectors. Cross-sectoral co-ordination will be analysed along the following categories:

1. **Co-ordination of processes and documents**: The documents that will be analysed may be linked and co-ordinated with other policy processes and documents. This might be in a very formal way, e.g. a particular document has to follow the rules set by another document, or by harmonization and mainstreaming processes or by formal or informal coordination of actors (see below).

2. **Co-ordination of actors**: Co-ordination of actors may take place on the administrative level or between administration and stakeholders of different sectors:
   - Administrative co-ordination:
     - Intra-ministerial coordination: Refers to the co-ordination of different sections or departments within the same ministry, for example the coordination of the agriculture and the forestry department within the respective ministry.
     - Inter-ministerial coordination: Refers to the coordination between different ministries, for example the ministry for environment and the ministry for economy.
     - Coordination between ministry(ies) and other public organizations: Other organizations may include public agencies and councils, such as research councils, etc.
   - Participation of stakeholders: Refers to the involvement of private, mostly organized, actors in political processes. Stakeholder involvement can take various forms from consultation processes via written statements to the inclusion of stakeholders in formal bodies and decision making processes. For example the National Forest Programme is elaborated in most European countries with the participation of stakeholders.

3. **Mechanisms of co-ordination**: Co-ordination may be formalized or take place on an informal level. Since the analysis of informal co-ordination can not be done from document analysis, we will focus on formal coordination mechanisms:
   - Formalized co-ordination may manifest in the following elements:
     - Formal (central) coordination body
     - Formal coordination process between key organizations
     - Inter-institutional working groups
     - Existence of advisory body
     - Formal consultation process
   - Informal co-ordination.

## 3. Step 1 – Preparatory Data Collection

*The following preparatory work serves to prepare the document analysis*.

### *3.1 Currently important innovation areas in the country*

Not all innovations addressed in the documents to be analysed are necessarily recognizable or specified explicitly as innovation, but are addressed under their specific name (e.g. to promote bio-energy in countries where bio-energy is seen as an important innovative topic).

The most important current forest sector innovations (forest sector innovation frontier) for each country should thus be identified before the document analysis in order to analyse whether and in how far the diffusion of these country specific important innovation areas in the forest sector is supported by different policies or documents.

Please list in the following table the most important product, process, marketing, organisational and institutional innovations in the forest sector in your country separately for the two areas territory-based services and value added chain.

Note that this preliminary list of seemingly important innovation areas in the country will be used for searching the documents for these words (using the "word search" function). Please do thus not over-specify (e.g. a certain detailed technical solution in construction). Please also exclude incremental standard managerial processes, maintenance support or late adoption (e.g. niche efforts for species diversity support, road building in forestry or standard IT in SMEs). For the whole table those **maximum 6-8 innovations** should be identified that attracted most attention in your country in the last 1-2 years. This might be reflected in the frequency of articles in newspapers or professional journals, the frequency of related events, topics that are widely discussed in the profession. Please specify these in broad categories (e.g. bio-energy in value added chain), with further specification as appropriate (for bio-energy, e.g. particularly for district heating). Please consult other COST Action E51 Working Group members in your country and verify your selections.

This first indicative list should be updated in the course of document analysis with a view to have a concise list of important innovation areas per country at the end of the first phase of COST Action E51.

**Table 2**. Innovation areas: Please list the max 6-8 most important innovation areas for your country

| Area / Type | Territory based services | Value added chain |
|---|---|---|
| **Product** | | |
| **Process** | | |
| **Marketing method** | | |
| **Organisational model** | | |
| **Institutional innovations** | | |

### *3.2 Specification of documents to analyse*

Please specify the documents you will analyse for each of the seven policy areas in the table below and shortly justify your selection if equal/similar documents exist, or if you have chosen a document for a specific region. Please also fill in the publication date, the website from which the document is available and whether and which specification documents exist. If no central/strategic document for one policy area exists please indicate.

Generally, the latest available programmes/documents should be used for the analysis. For example, for rural development policy the new Rural Development Programme 2007-2013 should be chosen.

Regarding Renewable Energy Policy please choose a renewable energy strategy (if available). If not available, please select (in this sequence) a strategy for generation of energy from wood, i.e. biomass action plan or similar; the section on renewable energy of a broader energy strategy or the renewable energy section of a climate strategy.

Concerning Regional Development Policy many countries have indicated to select their respective national Regional Development Programmes. Where such document does not exist you could rely on development strategies or programmes for particular regions, e.g. and INTERREG programme or similar.

**Table 3**. Documents for Task 1: Please list the relevant documents

| |
|---|
| **Forest Policy (Regional or National Forest Programme):**<br>Document: Name and reference number<br>Publication Date:<br>Website:<br>Supplementary documents: Name and ref. number |
| **Forest Based Sector Policy (Sector Policy Strategy), if any:**<br>Document: Name and reference number<br>Publication Date:<br>Website:<br>Supplementary documents: Name and reference number |
| **Innovation Policy (Regional or National Reform Programme):**<br>Document: Name and reference number<br>Publication Date:<br>Website:<br>Supplementary documents: Name and reference number |
| **Rural Development Policy (Regional or National Rural Dev. Programme, Forestry Part):**<br>Document: Name and reference number<br>Publication Date:<br>Website:<br>Supplementary documents: Name and reference number |
| **Regional Development Policy (Regional or National Regional Dev. Programme):**<br>Document: Name and reference number<br>Publication Date:<br>Website:<br>Supplementary documents: Name and reference number |
| **Sustainable Development Policy (Regional or National Sustainable Dev. Strategy):**<br>Document: Name and reference number<br>Publication Date:<br>Website: |

| |
|---|
| Supplementary documents: Name and reference number |
| **Renewable Energy Policy (Regional or National (renewable) Energy Strategy):**<br>Document: Name and reference number<br>Publication Date:<br>Website:<br>Supplementary documents: Name and reference number |

Part C "Appraisal of effects" will be undertaken only for the Rural Development Programme 2000-2006 as far as feasible and where country capacity allows their analysis. Please specify, whether and which evaluation documents exist for the Rural Development Programme 2000-2006 in your country.

**Table 1**. Evaluation documents for Task 2: Please list available evaluation documents incl. name, reference number and publication date

| |
|---|
| **Rural Development Policy (Regional or National Rural Dev. Programme, Forestry Part):**<br>Evaluation documents:<br>Publication Date: |

## 4. Step 2 – Document analysis

### *4.1 Part A – General description*

The objective of Part A is to provide general information on the policy document shaping the respective policy field in the country. The following Table 5 '*Part A – General document analysis*' guides the collection of the general information.

Please copy this table and fill in one table for each of the documents specified in Step 1 separately

Information should be rather general and give a basic overview on the document. This means you should keep entries rather short (headings, headwords). The filled-in table should not exceed 2 pages.

**Table 5**. Part A – General document information

| | |
|---|---|
| **Name:** | In English |
| **Adoption:**<br>Please mark by whom and at which level the document is adopted | ☐ Parliament ☐ Government ☐ Ministry:_____<br>☐ Others:_____ ☐ No formal approval<br>Level:<br>☐ National ☐ Regional ☐ Local<br>Adoption date: |
| **Validity period:** | |
| **Revision:** | Is (regular) revision/ update of the document planned? Has it already taken place, when? |
| **Monitoring/ Evaluation:** | Is the implementation of the document formally monitored? Has an evaluation taken place? Is an evaluation foreseen? |
| **Related documents:** | Please list further specifications or amendments of the document and documents that are closely related, i.e. have a direct reference to the document. This might include working programmes, annexes, etc. These documents should be analysed together with the main document. |
| **Geographical scope:** | ☐ National ☐ Regional; name: ☐ Local, name: |
| **Budget:** | Amount of budget in € (indicate whether per year or for whole document period); indicate the source for the budget, i.e. state, EU, regions, co-financed, etc. |
| **General description of contents as written in document** | |
| **Objective of the document** | Name shortly the main objective of the document (as written down in preamble, introduction part, vision or mission statements). |

| | |
|---|---|
| **Priorities** | Name the thematic priority areas of the document. |
| **Structure** | Shortly sketch the basic structure of the document, i.e. different thematic parts, basic elements (e.g. action areas, indicators, etc.) |
| **Measure Areas** | Name measure areas as described by the documents and general types of measures the document introduces. |
| **Follow-up / Implementation** | |
| **Follow-up measures:** | ☐ No follow-up activities so far<br>☐ New or adapted funding programme(s) /budget line; name:<br>☐ New or adapted regulations/laws; name:<br>☐ New or adapted informational campaigns/instruments; name:<br>☐ New or restructured institutions/organisations; name:<br>☐ Implementation in forest policy: |
| **General comment:** | List research needs you identified, they might be taken up in phase II of COST E51<br>Name further reference sources used |

### *4.2 Part B – Integration of innovation*

The guiding question for the analysis of the respective document is: whether and how innovation is taken up and integrated in the respective document.

Part B consists of three sections:
1. Overall Innovation Orientation (Table 6)
2. Innovation Support Measures (Table 7)
3. Cross-sectoral coordination (Table 8)

***Please copy the respective tables and fill in one table for each of the documents specified in Step 1 separately***

Table 6 '*Part B – Overall Innovation Orientation*' analysis bases largely on your expert judgement and interpretation of the text in the document. If necessary verify your judgements with other COST Action E51 participants from your country. The aim is to analyse in how far the document uptakes and is oriented at the topic innovation in general.

This table should be filled in in more detail for those documents with a higher relevance for the forest sector, e.g. the National Forest Programme or the Regional Development Programme. For other documents, esp. the National Reform Programme be rather short (use headwords, headings). The filled-in table should not exceed 3 pages.

**Table 6**. Part B – Overall Innovation Orientation

| | | |
|---|---|---|
| **Overall innovation orientation**<br>(use word search function). | Please mark the frequency of occurrence of the more generic terms 'innovation' or synonyms ('new products', 'new services', 'new processes', new marketing methods, 'new business models') in the document | ☐ never<br>☐ sometimes<br>☐ frequently |
| | Please mark the frequency of occurrence of the forest sector 'innovation frontier' – innovation areas identified in Chapter 3 - in the document | ☐ never<br>☐ sometimes<br>☐ frequently |
| | Please mark the frequency of occurrence of the terms that are related to innovation, for example entrepreneurship, diversification, competitiveness | ☐ never<br>☐ sometimes<br>☐ frequently<br>Terms used: |
| | Further comments on overall innovation orientation of the document: | |

| | |
|---|---|
| **Relevance of innovation:**<br>Please mark how much relevance is given to innovation in the document (one answer) | ☐ No relevance at all<br>☐ Marginal issue<br>☐ One issue among others<br>☐ Important issue<br>☐ Central issue<br>Comments: |
| **Degree of specification:**<br>Please mark how general or specific innovation is addressed by the document (one answer)<br>Please use comments section to describe if the degree of specification varies for different parts of the document, esp. when concerning forestry | ☐ very general *(innovation is named in general parts, e.g. preamble, but no related goals, measures, identified needs or similar are addressed by the document)*<br>☐ rather general *(innovation is addressed in overall goals, needs are identified but no specification of measures)*<br>☐ rather specific *(innovation is addressed in concrete goals, measures are formulated)*<br>☐ very specific *(quantified goals related to innovation are formulated, concrete measures introduced, a fixed budget and timetable exist)*<br>Comments: Please specify further in which context innovation is addressed (Is innovation a goal, underlying rationale, a strategy or means to reach other goals, unrelated, etc.?) |
| **Understanding of innovation policy**<br>Please assess what overall understanding of innovation policy is reflected in the document. See chapter 2.2.1 | ☐ Predominately traditional science and technology policy<br>☐ Traditional S&T policy with systemic elements<br>☐ Systemic innovation policy with S&T policy elements<br>☐ Predominantly systemic innovation policy<br>Comments: Please describe further the undertanding of innovation policy |
| **Goals and objectives:**<br>Please specify further what objectives and goals (quantitative and qualitative) are formulated in relation to innovation? | |
| **Issues, problems and related topics:**<br>Please describe shortly what main issues and problems are formulated in relation to innovation? Does the programme address other issues that are related to innovation, e.g. competitiveness of the sector, diversification etc.? Please describe shortly | |
| **Innovation areas:**<br>Please name the most important innovation areas named by the document and compare with the results gathered in table 3.1. | |
| **General comment:**<br>List research needs you identified, they might be taken up in phase II of COST E51<br>Name further reference sources used | |

Table 7 "*Part B – Innovation support measures*" below helps to gather and organize information on the support measures that are introduced by the document. *Also when no concrete measures are included, please analyse proposed activity areas/measures/needs within the document.*

Please list the identified support measures according to the **six main support categories introduced in chapter 2.2.2**.

This table should be filled in in more detail for those documents with a higher relevance for the forest sector, e.g. the National Forest Programme or the Regional Development Programme. For other documents, esp. the National Reform Programme be rather short (use headwords, headings, examples). The filled-in table should not exceed 3 pages.

**Table 7**. Part B – Innovation Support Measures

| | | |
|---|---|---|
| **Innovation support measures** *Consult classification in chapter* | **Research and Development** | List support measures proposed or implemented by the document that target research and development activities by enterprises. |
| | **Diffusion of innovation** | List support measures proposed or implemented by the document that target the diffusion of known products, processes, marketing methods, and organisational methods. Specify for which products, processes, marketing methods, and organisational methods support is given. Refer to and compare with the list gathered under 3.1. |

| | | |
|---|---|---|
| *2.2.2* | **Strengthening the knowledge base** | List support measures proposed or implemented by the document that aim at strengthening the knowledge base for innovation. |
| | **Strengthening interaction** | List support measures proposed or implemented by the document that aim at strengthening the interactions between key actors. |
| | **Demand creation** | List support measures proposed or implemented by the document that aim at promoting the demand for innovation. |
| | **Improving frame conditions** | List initiatives/ policy actions proposed or implemented by the document that aim at improving the framework conditions for innovation. |
| | **Comments** | |
| **Priorities** | | Please assess qualitatively which of the above mentioned category(ies) is a priority area for innovation support within the document. Please give short reasoning for your judgement |
| **Assessment of overall relevance** | | Please assess qualitatively the overall relevance of innovation support measures compared to other support measures proposed or introduced by the document. Give short reasoning for your judgement. |
| **Promotion of innovation** | | Please assess qualitatively how much innovation is furthered by the document. This would include the assessment of the overall relevance of innovation within the document as well as the relevance of the document for the policy area. |
| **General comment:** | | List research needs you identified, they might be taken up in phase II of COST E51<br>Name further reference sources used |

Table 9 "*Part B – Cross-sectoral coordination mechanisms*" below helps to collect information on cross-sectoral co-ordination mechanisms see guidelines chapter 2.3.

**Table 8**. Part B – Cross-sectoral coordination

| **Policy formulation** | |
|---|---|
| **Co-ordination with other processes and documents** | Please list other processes or documents with which the considered document is formally co-ordinated |
| **Administrative Co-ordination:** | ☐ between different sections/departments within the same ministry; specify: _____<br>☐ between different ministries, specify: _____<br>☐ between ministries and other public organizations / agencies, specify: _____<br>Comments: Shortly explain the role of the main administrative actors |
| **Stakeholder involvement** | ☐ Forestry: name most important organisations: _____<br>☐ Forest-based industries: name most important organisations: _____<br>☐ Agriculture: name most important organisations:_____<br>☐ Tourism: name most important organisations: _____<br>☐ Energy: name most important organisations: _____<br>☐ Environment: name most important organisations: _____<br>☐ Other sector: _____: name most important organisations: _____<br>☐ Other sector: ____: name most important organisations: _____<br>Comments: Shortly describe the type of stakeholder involvement |
| **Coordination mechanisms:** | ☐ Formal (central) coordination body; name: _____<br>☐ Formal coordination process<br>☐ Inter-sectoral working groups<br>☐ Inter-sectoral advisory body<br>☐ Formal mandatory consultation process<br>☐ Formal voluntary consultation process<br>☐ Informal consultations (please describe _____)<br>☐ Others: _____ |
| **Policy Implementation** | |
| **Responsible actors and their roles:** | Shortly explain the role of the main actors in the implementation of the document |

| | |
|---|---|
| **Level of delegation** | ☐ Decentralized, e.g.<br>☐ Central, e.g. ministry, public agency<br>☐ Outsourced to private actors<br>☐ Local, e.g. by municipalities<br>☐ Regional, e.g. by regional public actors<br>☐ Others: _____ |
| **General comment** | List research needs you identified, they might be taken up in phase II of COST E51<br>Name further reference sources used |

### *4.3 Part C – Appraisal of effects: Rural Development Programme 2000-2006*

Most of documents that will be analysed in Part A and Part B are rather new, and effects will not be separately appraised. Task 2 "Appraisal of effects" will therefore be implemented only for the Rural Development Programme 2000-2006 wherever country capacities allow.

Sources to be used are monitoring data, mid-term evaluation and final evaluation reports.

Please insert in Table 9 general information on the programme output for the whole Rural Development Programme and the forestry part of the programme separately.

**Table 9**. Part C – Appraisal of Effects – General Information

| | **Whole document (RDP)** | **Forestry Part** |
|---|---|---|
| **Total amount of funding** | Amount of budget in mil. € | Amount of budget in mil. € |
| **Total number of projects** | | |
| **Total number of beneficiaries** | | |
| **Average amount of funding per project** | in € | in € |
| **Median of project funding** | in € | in € |
| **Average amount of funding per beneficiary** | in € | in € |
| **Median of funding per beneficiary** | in € | in € |
| **General comment:**<br>incl. research needs and further reference sources used | | |

Please fill in Table 10 for only for the forestry part of the Rural Development Programme 2000-2006. The categories refer to the classification of innovation support in chapter 2.2.2. Gathering data for these categories includes re-ordering of monitoring data. Participants who undertake this task will receive further special guidance.

**Table 10**. Part C – Appraisal of Effects: Funding for private sector innovation

| **Support for** | **Research & development** | **Diffusion of innovation** | **Strengthening knowledge base** | **Strengthening interaction** | **Demand Creation** |
|---|---|---|---|---|---|
| **Volume of funding in €** | | | | | |
| **Share of funding in overall funding in %** | | | | | |
| **Number of projects supported** | | | | | |
| **Share of projects in all projects in %** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Average funding per project in €** | | | | | |
| **Number of beneficiaries** | | | | | |
| **Share of beneficiaries in total number of beneficiaries in %** | | | | | |
| **Average amount of funding per beneficiary in €** | | | | | |
| **Priorities of funding** | Please state which activities were most often supported in this category (see list in chapter 2.2.2) | Please state which innovation areas were most often supported in this category (see list in chapter 2.2.2) and in what stage of adoption | Please state which activities were most often supported in this category (see list in chapter 2.2.2) | Please state which activities were most often supported in this category (see list in chapter 2.2.2) | Please state which activities were most often supported in this category (see list in chapter 2.2.2) |
| **Overall assessment:** Please give an overall assessment on the actual support of innovation by the programme. | | | | | |
| **General comment:** incl. research needs and further reference sources used | | | | | |

## 5 Structure of country reports

This chapter provides an outline of the structure of the country reports. The country reports consist of an introductory section, the input to chapter 3 of the guidelines (Chapter 2 of the Report) as well as all filled in tables for Part A and Part B for the seven concerned policy documents separately (Chapters 3.-9. of the Report).

1. Introduction

2. Innovation areas in forestry in the country (input to chapter 3)

3. Forest Policy – National Forest Programme
   - 3.1 General information – based on Part A of document analysis
   - 3.2 Integration of innovation – based on Part B of document analysis

4. Forest-Based Industries Policy
   - 4.1 General information – based on Part A of document analysis
   - 4.2 Integration of innovation – based on Part B of document analysis

5. Innovation Policy – National Reform Programme
   - 5.1 General information – based on Part A of document analysis
   - 5.2 Integration of innovation – based on Part B of document analysis

6. Rural Development Policy – Rural Development Programme
   6.1 General information – based on Part A of document analysis
   6.2 Integration of innovation – based on Part B of document analysis
   (6.3 Appraisal of effects – based on Part C of document analysis) by sub-group

7. Regional Development Policy
   7.1 General information – based on Part A of document analysis
   7.2 Integration of innovation – based on Part B of document analysis

8. Sustainable Development Policy
   8.1 General information – based on Part A of document analysis
   8.2 Integration of innovation – based on Part B of document analysis

9. Renewable Energy Policy
   9.1 General information – based on Part A of document analysis
   9.2 Integration of innovation – based on Part B of document analysis

10. Research Needs
    List research needs and research *questions you have identified during your analysis*.

## 6. References

Edquist, C. and B. Johnson (1997). Institutions and Organizations in Systems of Innovation, in: C. Edquist: Systems of Innovation. Technologies, Institutions and Organizations. London and Washington, Pinter.

Goorden, L. (2004). Innovation Policy and Technology Assessment in Flanders. STEM – Research Centre on Technology, Energy and Environment.

Lengrand. L. and Associés. PREST en ANRT (2002). Innovation Tomorrow. Innovation Policy and the Regulatory Framework: Making Innovation an Integral Part of the Broader Structural Agenda, European Commission, DG Enterprise, Innovation Papers no. 28, Brussels.

OECD (2005). Osol Manual: Guidelines for Collecting and Interpreting Innovation Data. Paris, OECD.

**Sources**

Forest Policy:
- Website of Ministry in charge of forestry in your country
- FAO NFP Facility: http://www.fao.org/forestry/foris/webview/facilitynew/index.jsp?siteId=6813&sitetreeId=30765&langId=1&geoId=163

Forest-based Industry Policy:
- http://www.forestplatform.org/

Innovation Policy:
- List of links to National Reform Programmes: http://ec.europa.eu/growthandjobs/pdf/nrp_2005_en.pdf
- EU Trend Chart on Innovation. Country reports (see http://trendchart.cordis.lu/)

Rural Development Policy:

- Website of ministry in charge of rural development
  http://ec.europa.eu/agriculture/rur/countries/index_en.htm

Regional Development Policy:

- Website of ministry in charge of rural development
  http://ec.europa.eu/regional_policy/atlas/index_en.htm
  http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm

Sustainable Development Policy:

Links to National Sustainable Development Strategies:

- Austria: A Sustainable Future for Austria: The Austrian Strategy for Sustainable Development (2002)
  www.nachhaltigkeit.at/strategie/pdf/strategie020709_en.pdf
  www.nachhaltigkeit.at/strategie.php3?strat_strategie.php3
  www.lebensministerium.at/index
- Czech Republic: The Czech Republic Strategy for Sustainable Development (2004)
  http://wtd.vlada.cz/scripts/detail.php?id=5391wtd.vlada.cz/eng/vybory.htm
- Denmark: Denmark's National Strategy for Sustainable Development: A Shared Future – Balanced Development (2002)
  www.mst.dk/udgiv/publications/2002/87-7972-279-2/pdf/87-7972-259-8.pdf
  www.mst.dk/udgiv/publications/2002/87-7972-279-2/html/default_eng.htm
- Finland: The Finnish Government Programme for Sustainable Development (1998)
  www.environment.fi/download.asp?contentid=6081&lan=en
  www.environment.fi/default.asp?node=9732&lan=en
- France: Stratégie Nationale de Développement Durable: Enraciner l'Avenir dans l'Action (2003)
  www.ecologie.gouv.fr/article.php3?id_article=4177
  www1.environnement.gouv.fr/rubrique.php3?id_rubrique=680
  www1.environnement.gouv.fr/article.php3?id_article=1198
- Germany: Perspectives for Germany – Our Strategy for Sustainable Development (2002)
  www.nachhaltigkeitsrat.de/service/download_e/pdf/Perspectives_for_Germany.pdf
  www.nachhaltigkeitsrat.de/service/links_e/05.html
  www.bundesregierung.de/Politikthemen/Nachhaltige-Entwicklung-,11409/Die-Nachhaltigkeitsstrategie-d.htm
  www.umweltbundesamt.de/uba-info-e/sustgerm.htm
- Italy: Strategia d'azione ambientale per lo sviluppo sostenibile in Italia (2002)
  www.minambiente.it/SVS/svs/docs/strategia_azione_ambientale.pdf
- Norway: Norway's National Plan of Action for Sustainable Development National Agenda 21 (2003)
  http://odin.dep.no/filarkiv/206402/nat_action.pdf
- Poland: Poland 2025 Long-term Strategy for Sustainable Development
  www.rec.hu/sdconference/doc/PL_strategia.doc
  www.mos.gov.pl/index_main.shtml
  www.ceu.cz/edu/ma21/strategy_poland.htm
- Portugal: National Strategy for Sustainable Development (2002)
  www.iambiente.pt/ngt_server/ngtifs/iFileDialog.jsp?path=//Servidor/5829/ENDSing.pdf&action=7
  www.iambiente.pt/docs/5421/ENDS_dp.pdf
- Romania
  http://www.sdnp.ro/ncdpublications/nssd.pdf#search=%22Romania%20Sustainable%20development%20strategy%22

- Slovak Republic: National Strategy for Sustainable Development for the Slovak Republic (2002)
  www.tur.sk/doc_en/Slovakia_NSSD_Final.pdf
  www.tur.sk/index.stm?apc=0--5ed5460afc52a69ce1aa16a204115b39-1-1&x=86783
- Sweden. A Swedish Strategy for Sustainable Development – Economic, Social and Environmental (2003)
  www.sweden.se/upload/Sweden_se/english/publications/RK/PDF/RK%20Sustainable%20development.pdf
  www.sweden.gov.se/sb/d/2066
- United Kingdom: United Securing the Future – Government Sustainable Development Strategy (2005)
  www.sustainabledevelopment.gov.uk/documents/publications/strategy/SecFut_complete.pdf
  www.sustainable-development.gov.uk/publications/uk-strategy/uk-strategy-2005.htm
  www.sustainable-development.gov.uk/index.htm

## Annex 2: Criteria for assessing policy integration.

See chapter II.

**General criteria**

- Political commitment and leadership for PI in general
- Need for compliance with international and EU commitments
- Existence of long term … strategy (or a relevant Report or Forum)
- Favourable policy tradition and administrative culture (open, participatory, horizontal)
- Shared core belief systems and communication across policy sectors

**Criteria related to the policy object**

- Congruent, compatible, consistent and/or complementary policy objects and related theories
- Multidimensional policy objects and related integrated/interdisciplinary theories
- Common and consistent concepts and terminologies

**Criteria related to policy goals and objectives**

- Political commitment/ leadership for PI in the case of the policies analyzed
- Common, shared, congruent, compatible and/or complementary policy goals and objectives
- Stipulation of quantitative, measurable, indicator-based targets and timetables for PI

**Criteria related to policy actors**

- Common formal actors on and across various spatial/organizational levels
- Common informal actors on and across various spatial levels

**Criteria related to policy structures and procedures**

- Administrative capacity for PI; it concerns, among others:
    - Organization in charge of PI; such as, a central unit entrusted with supervision, coordination and implementation of the integration process or assigning existing institutions a new mandate, responsibility and accountability for PI
    - Special unit for PI in the competent organization
    - Officials charged with integration tasks
    - Administrative reform (restructuring) in favour of PI
    - Presence of horizontal administrative structures as opposed to vertical and departmentalized structures; e.g. inter-ministerial committees and task forces, issue-specific joint working groups, networking schemes, regular circulation of staff
- Formal/institutionalized and informal interaction among policy actors and actor networks; among state and non-state policy actors
- Consistent, compatible and coordinated procedures and rules of decision-making in competent administrative bodies
- Strengthening existing administrative units with regard to procedural rights and rules relevant for coordination and joint problem-solving
- Joint decision making and joint responsibilities of the policy sectors considered
- Provisions for implementing PI requirements (e.g. compliance, enforcement and accountability mechanisms for PI among competent agencies)

**Criteria related to policy instruments**

- Institutionalizing PI; existence of a legal framework for PI among the policies analyzed
- Instruments used by different policies are compatible and consistent
- Use of one policy as an instrument to achieve the goals of another policy
- Use of integrative instruments; such as, legal, economic, financial, planning
- Common legal and institutional instruments
- Compatible, consistent and coordinated legal and institutional instruments
- Market-based integration between the two policies
- Favourable budgetary process
- Common or coordinated/compatible sector Action Plans
- Common, shared research resources, common, or compatible and consistent, data and information bases
- Common assessment and evaluation methodologies, and tools (PI indicators)
- Common monitoring programmes and infrastructure
- Education and training services for civil servants, bureaucrats, etc. on PI issues

*Source*: Briassoulis (2004)

## Annex 3: Nationally important innovation areas in the forest sector (years 2006/2007).

Results from the COST Action E51 country reports, specifically for the use in chapter IV.

| Innovation type | Territory based services | Wood-related value added chain |
|---|---|---|
| **Product** | Non-timber forest products (BG, HR)<br>o Medicinal plants (BG)<br>o mushrooms (BG)<br><br>Environmental services (AT, BG, CH, DE, LT, RO, UK)<br>o Contracts for nature conservation services of forestry (AT, DE)<br>o Biodiversity conservation (BG, RO) (key habitants, biosphere reserves) (LT)<br>o Pollution/Greenhouse gas (carbon) sequestration (CH, RO, UK)<br>o Carbon emissions ($CO_2$) trading (LT)<br>o Urban Renewal (WIAT) (UK)<br><br>Recreational services / outdoor activities (AT, CZ, DE, FI, FR, HR, IT, RO, SK, UK)<br>o Adventure trips (AT)<br>o Manager seminars, team building seminars, survival training (AT, DE)<br>o Mountain bike trails (AT, UK)<br>o Climbing forests: "High rope gardens" (DE) "Go Ape" (UK)<br>o forest cottages for tourists (HR)<br>o Landscape management for tourism (FR)<br>o Eco-tourism (RO)<br><br>Forest education (AT, CH, DE, HR, IT, LT, SK, UK)<br>o Forest schools (CH, UK)<br>o Eco-track (HR)<br>o Cognitive, educational and special recreational trails (with a special appliance for disabled visitors) (LT)<br><br>Health and social services (FI, UK)<br>o Wellness products/services (FI)<br>o Health initiatives ('Green Gym') (UK)<br>o Social Housing (UK)<br><br>Spiritual and cultural services (DE, UK)<br>o Friedwälder (Forest Cemeteries) (DE)<br>o "The Enchanted Forest" (UK) | Bio-energy from wood (AT, BG, CH, CZ, FR, HR, IT, LT, NO, PL, PT, RO, SE, SK, UK)<br>o Solid biomass (AT, CH, FR, HR, IT, LT, PL, PT, RO, SE, UK)<br>- District heating (AT, FR, HR, LT, PT)<br>- Wood chips (CH, FR, HR)<br>- Pellets (BG, CH, FR, IT, RO)<br>- Briquettes (BG, CH, RO)<br>- Black pellets (peat) (NO)<br>- Logging residues (PL)<br>o Biofuel (AT, FR, PL, SE, UK)<br>- Bio-refinery (FR)<br>- Production of liquid fuels (PL)<br>- Bio fuel development (UK)<br>o Biogas (AT, CH)<br>o Plantation of fast growing species (poplar, eucalyptus) incl. short rotation coppices (FR)<br><br>Construction (CH, CZ, EE, RO, SK, UK)<br>o Wood prefabricated houses (CH, CZ, SK)<br>o Wooden apartment buildings (CH, EE, RO)<br>o Wood-based panels (EE)<br>o Sustainable construction (UK)<br><br>Wood modifications (AT, CH, DE, FI, FR, NO, UK)<br>o Wood composites (AT, FI, UK)<br>o Heat treatment / thermo wood (CH)<br>o Surface treatment of wood (nano) (CH)<br>o Compressed timber (DE)<br>o Chemical interlacing of wood (e.g. beech) (DE)<br>o Constituted wood and engineered wood products (FR)<br>o Furfurylated wood (NO)<br><br>Chemical products (AT)<br>o Speciality products from chemical substances (lignin) (AT) |
| **Process** | Valuation of services (CH)<br><br>Network based operations in nature tourism (FI)<br><br>Meso-scale forest planning (IT)<br><br>Processing of other forest products - deep freezing of mushrooms (in liquid nitrogen) (PL)<br><br>Forest fire detection using LIDAR (Light Detection And Ranging) (PT) | Afforestation (PT)<br>o Genetically improved material for afforestation (PT)<br><br>Harvesting (CH, CZ, FR, IT, LT, SK)<br>o Harvester technology (CH, CZ, LT, SK)<br>o Cable logging for mountainous conditions (FR)<br>o New grading system for logs (IT)<br><br>Wood processing (LT, SE, UK)<br>o New technologies for wood chips production (LT)<br>o Independent timber measurement system (LT)<br>o Industrialized production/process in construction (SE)<br>o Processing poorer logs (UK)<br>o New and advanced technologies for wood processing (UK)<br><br>Use of ICT (CH, DE, EE, FI, FR, LT)<br>o Computer aided wood processing (CH)<br>o Innovation in data transfer during timber selling (DE) |

| Innovation type | Territory based services | Wood-related value added chain |
|---|---|---|
| | | ○ Radio Frequency Identification (RFID) (DE, FI, FR)<br>○ GPS (DE, FR)<br>○ GIS application software (EE)<br>○ CNC, CAM-technologies (EE)<br>○ APMP technology (EE)<br>○ Timber measurement system (independent) (LT)<br><br>Logistics (AT, DE, FI, FR NO, SE)<br>○ Logistics optimization (AT)<br>○ Radio Frequency Identification (RFID) technology in timber logistics (DE, FI)<br>○ GPS Navigation system for forest logistics) (DE, FR)<br>○ Wireless software in wood harvest and transportation (FI)<br>○ Logistics of wood procurement incl. platforms (FR)<br>○ Wood energy plans for territorial procurement (FR)<br>○ Timber landing at boats at the West Coast in Norway (NO)<br>○ SCM solutions (SE)<br>○ Pick-a-pack solutions (SE)<br><br>Prefabrication and modularity (AT, CH, SE, UK)<br>○ Modularity and/or prefabrication in wood based industries – outsourcing (SE)<br>○ Prefabrication and modular construction, system building (AT, CH, SE, UK); additional components: regional value added chains and ecological orientation, trend towards solid wood panels (AT)<br><br>Environment-oriented production process (UK)<br>○ Energy efficiency (UK)<br>○ Bio friendly adhesives (UK) |
| **Marketing method** | Marketing of forest non-wood forest products and services (AT, BG, CZ, DE, FI, IT, NO, SK, UK)<br>○ Marketing of nature conservation services, eco-sponsoring (AT, DE)<br>○ Hunting tourism (BG)<br>○ Introduction of social functions to the market (CZ, SK)<br>○ Joint trails – combined services of several SMEs under one brand/label (FI)<br>○ Recreation (NO)<br><br>Internet marketing (AT, FI, PL, SE, UK)<br>○ Internet platforms for marketing of forest-related services (AT)<br>○ e-marketing in nature tourism (FI)<br>○ Usage of Internet (SE, UK)<br><br>Territorial marketing – regional brands (FR, IT)<br>○ AOC (brand): appellation d'origine controlée (ex. AOC bois de Charteuse ; label bois de Alpes) (FR)<br><br>Carbon emissions trading (LT)<br><br>Certification of attraction according to criteria (SE)<br><br>Greenspace research and public engagement (UK)<br><br>Engagement with mountain bike associations, regional tourist boards, tourism providers, development of specific websites (UK) | Brands/Product promotion (DE, UK)<br>○ "Biomassehöfe" as a new marketing approach for forest products (DE)<br>○ Based on environmental sustainability credentials (UK)<br>○ Selling the UK's timber strengths (UK)<br><br>Certification (AT, CH, FR, HR, IT, UK)<br>○ Certification of SFM (AT, CH, FR, HR, IT)<br>○ Chain-of-Custody (FR), traceability systems (IT)<br>○ Certificate of origin (IT)<br>○ Environmental sustainability credentials (UK)<br><br>Sales methods (AT, BG, CH, CZ, FI, FR, IT, PL, RO, SE)<br>○ "Laubholz-Submission" – Joint auctioning of high-quality hard-wood timber (AT)<br>○ Selling standing timber (BG)<br>○ Selling wood on stock exchange (BG, CZ)<br>○ Energy wood contracting (CH)<br>○ Constitution and development of commodity exchange with wood (CZ)<br>○ Internet - forest-timber portal, by State Forests, for selling timber (PL); Timber platform – frame construction (FI); Moneral Design – internet and dealer network (FI)<br>○ New schemes of wood sales (contracts vs. auctions) (FR)<br>○ Associated auctions (IT)<br>○ Selling timber on the road (RO)<br>○ Targeted marketing for key-accounts and segments (wood products) (SE) |

| Innovation type | Territory based services | Wood-related value added chain |
|---|---|---|
| **Organisational model** | Forest owners' cooperation for nature conservation (AT)<br><br>Nature conservation Centre – a state organisation where all national parks, nature reserves, etc are under common management (EE)<br><br>Large forest companies have branches for tourism development (FI, SE)<br><br>National Parks (RO)<br><br>Holding company within forest enterprises for hunting (SE) | Horizontal cooperation (AT, CH, CZ, DE, HR, IT, LT, RO, SK)<br>o Horizontal cooperation of forest owners (CZ, HR, IT, LT, RO, SK)<br>o Regional associations of wood harvesters (RO)<br>o Biomass cooperatives (AT)<br>o Timber selling organisations, e.g. by private forest owners in Uelzen, Lower Saxony (DE)<br>o Cooperation of sawmills (CH)<br>o Concentration in timber manufacturing (CH)<br><br>Vertical cooperation (AT, CZ, HR, IT, SK, UK)<br>o Cooperation of farmers with large energy suppliers in bio-energy supply (AT)<br>o Cooperation of forest owners with saw-milling (AT)<br>o Local short production chains for for biomass (integrateion of forest with wood energy use etc.) (IT)<br>o Vertical cooperation along the forestry-wood chain (SK)<br>o One that vertically integrates forest owners with the process (UK)<br><br>Clusters (DE, FI, FR, HR)<br>o Cluster management approaches (e.g. Innoregio-Projekt Sächsischer Musikwinkel/Musicon Valley) (DE)<br>o Cluster, sectoral pole (direct or indirect such as Fibre Poles, Chemical Pole), Pole de competetivite (FR)<br><br>Outsourcing of timber harvesting (CH, IT)<br><br>Licences for harvesting companies and single forest workers (IT)<br><br>Privatisation (IT)<br><br>Larger industries change the geographical organisation with a product organisation (SE)<br><br>Innovation centres (SK) |
| **Institutional innovation** | Regional cross-sectoral integration/coordination (CZ, DE, FR, HR, IT, SE, SK, UK)<br>o Regional cooperation (CZ)<br>o Integrated rural development / Regional Governance approach (LEADER, Regionen aktiv) (DE)<br>o Organisation of a forest territory for different uses and needs (charte de territories, schemas de massifs, plan de massif) and Pole d'excellence rurale (PER) (FR)<br>o Cross-sectoral cooperation (HR)<br>o Partnerships between regional authorities and local business community to develop territory based activities (SE)<br>o RIS, cooperation among regional R&D institutions, local governance, SMEs (SK)<br>o Combining both top-down and bottom-up (UK)<br>o Community involvement in woodland management (UK)<br>o Involvement of a wide range of stakeholders (UK)<br><br>Integrated spatial planning (CH, FR, PT)<br>o Integration of the forest sector into spatial planning (CH)<br>o Strategic plan of rural development (FR) | Sector integration (FI, FR, IT)<br>o Leader firm partnering network for exports and logistics (FI)<br>o Sector initiatives such as Future Forum on Forests, WoodWisdomNet, Forest Academy for decision makers, etc.) (FI)<br>o National organisation of the forestry-wood chain (France Foret Bois) (FR)<br><br>Cross-sectoral coordination (DE, IT, SE)<br>o Integrated rural development / Regional Governance approach (LEADER, Regionen aktiv) (DE)<br>o Creation of stable systems of stakeholder consultation (IT)<br>o Triple-helix view on business development, policies developed as partnership projects (SE)<br><br>New national policies (FR, HR)<br>o Wood mobilisation scheme (FR)<br>o Financial support (HR) |

| Innovation type | Territory based services | Wood-related value added chain |
|---|---|---|
| | ○ ZIF – Zona de Intervenção Florestal (Zone of Forest Intervention) (PT)<br><br>New national policies (CH, FI, HR, PT)<br>○ Programme agreements between the Confederation and the cantons (e.g. Effor2, NFA) (CH)<br>○ National Theme Groups, e.g. on Non-Timber Forest Products (FI)<br>○ Advisory assistance (HR)<br>○ FFP – Fundo Florestal Permanente (Permanent Forest Fund) (PT) | |

## Annex 4: Future trends, threats and opportunities recognized in national forest and forest industry policies in Finland, Sweden, Norway, Austria, Poland and Romania.

This Annex summarizes the contents of forest and forest industry policies in Finland, Sweden, Norway, Poland, Austria and Romania for the use in chapter VI. The policies are defined with trends, threats and opportunities implicitly or explicitly recognized in the main national-level policy documents. In addition to these, the measures and recommendations for action on how the policies should be implemented to tackle the future challenges are provided. The key words for the document analysis were: *future, trend, opportunity, challenge, threat, measure, action*.

**Finland**

*Forest and forest industry policy overview*

The competitiveness and profitability of large Finnish paper industries decreased sharply in 2002-2005. This led to company specific development programs to improve the operational effectiveness of different machines, factories and forestry operations. Still, two major paper mills, several paper machines and one medium-size pulp mill were closed between 2006 and 2008. An additional challenge appeared in 2006 when Russia announced that they would gradually and substantially raise the already existing export duties of roundwood till 2011. This would, in practise, stop the import of approximately 25 %, equal to nearly 20 million cubic meters, of total roundwood consumption in Finland already in 2009, when the export duty would raise up to 50 Euro per cubic meter for other timber assortments than birch pulpwood.

The decreasing competitiveness of traditionally strong paper industries in Finland and the threat of sharply declining wood imports from Russia led into major shifts in Finnish forest and forest industry policies. Firstly, the main emphasise of forest policy (Finnish National Forest Programme 2015) was put on increasing the forest harvestings from domestic privately owned forests. Different means like increased consultation with the private forest owners and tax reduction for the income from wood sales were rapidly developed in 2007. For example, the government of Finland decided in July 2008 that only 50 % of the incomes from timber sales would be taxed in 2008 and 2009 and 25 % in 2010.

Secondly, the forest industry policy was rapidly renewed. The new forest industry policy emphasised strongly the R&D investments on new products and the production, energy and material efficiency of existing production. The most concrete mean to increase the R&D inputs of companies, the Finnish innovation actors and the EU, was to establish so called Forest Cluster Ltd in 2007. It is a development company owned by major forest cluster companies and six research organisations and Universities, aiming to generate and allocate private and public funding for jointly agreed R&D programmes to support the development of pulp, board and paper based forest cluster in Finland.

Following the initiative to develop the pulp, bord and paper based forest cluster R&D, the mechanical wood product cluster actors published their own research strategy in August 2008. One aim of the strategy was to establish so called Wood Product's Cluster Ltd, which would be a similar development company as the Forest Cluster Ltd, but in this case for the coordination of R&D investments to support the development of mechanical wood cluster companies.

Trends forestry:

- increasing need for domestic wood mobilization due to the rising export duties for Russian timber in 2009
- continuous growth in the demand for forest biodiversity conservation and multiple use forestry
- rising awareness on the role of forests in the mitigation of climate change and maintaining high water quality
- declining average size of non-industrial private forest holdings

Trends forest industry:

- declining global price competitiveness
- rising public awareness on the difficulties of forest industries
- increasing investments on R&D to support forest industries competitiveness and renewability

Threats forestry:

- declining availability of labor for harvesting, wood transportation and forest work
- under-utilized timber growth and unsatisfactory wood supply to the markets (less than 60% of the total forest growth is harvested annually)
- declining quality of roads and railroads for timber transportation
- shortening period for wood transportation on frozen soil at wintertime

Threats forest industry:

- shortage of wood fiber and timber
- growing energy, labor and wood costs
- declining world market prices for especially paper products
- declining price competitiveness of pulp and paper industries

Opportunities forestry:

- increasing demand for wood residues, stumps and other forest-based biomass for energy
- growing demand for private forestry services
- new instruments for forest owners to earn compensation for providing climate (carbon), biodiversity or amenity services

Opportunities forest industry:

- increasing demand for renewable materials and products in Europe
- increasing investments on R&D for new products and business models
- high political commitment for renewing forest industry production

***The measures and recommendations for action on how the forest and forest industry policies are implemented to tackle the trends, challenges and opportunities***:

In addition to the preparation of the National forest program and two major R&D programs (one for the Finnish chemical forest cluster and the other for mechanical forest industries), a high level policy group worked under the Prime Minister's Office to suggest means to improve the conditions of the forest sector in Finland in the long run (Valtioneuvoston kanslia 2008). The group made nearly twenty recommendations on how the trends, challenges and opportunities of the forest sector should be considered in decision making. The following action proposals were made on forestry, increasing value added from the forests and on the development of forest-based sector's operational environment:

Action proposals on forestry:

- A survey should be conducted by 2011 to define the principle means for improving timber transportation infrastructure in the country.
- The effectiveness of public subsidies to support wood production should be re-assessed.
- R&D on timber harvesting and transportation from peat lands should be increased.
- Year-round working conditions for forest machinery workers should be developed.
- Monitoring of the demand for forestry professional's education should be developed.
- A program for increasing the average size of forest holdings should be established.
- The availability of forest information to various needs and the development of new forest management planning tools should be accelerated.
- The Ministry of employment and economy should produce a plan on how to develop entrepreneurship in private forestry services.
- A working group should be established to renew forest taxation system in the country.

Action proposals on how to increase value-added from the forests:

- Foresight should be integrated to the overall development of the forest-based sector. The coordination of foresight works should be improved.
- The co-operation between private companies and public sector in R&D should be further strengthened. In basic research, Nording and EU research programs should be actively participated.
- Participation in the preparation of international regulations and product standards should be strengthened.
- The Ministry of employment and economy should prepare a plan on how to attract capital investments to support the development of innovations in the forest-based sector.

Action proposals on the development of forest-based sector's operational environment:

- The positive role of forest-based sector in the international climate change and bio-energy issues should be promoted better.
- A national commission should be established to prepare proposals to improve the conditions for timber markets and wood availability.
- The supply of energy for wood processing should be secured.
- An independent assessment for the forest governance should be prepared.

**Sweden**

*Forest and forest industry policy overview*

Swedish forest policy is based on the Forestry Act and the Environmental Code and mainly focuses on forest management issues of obtaining a sustainable forest resource. Production and environmental goals attain the same weight, and since 1993 the policy follows a minimalistic approach to legislative and regulatory measures based on voluntary agreements between state and forest owners with few binding rules. The forest policy is divided into three levels; policy objectives defined by the government, long-term vision elaborated by National Board of Forestry and other stakeholders and interim targets as short term measurable goals. Short term targets includes economic, environmental and socio-cultural aspects of forests and forestry. Examples of short term targets include increased pre-commercial thinning, improved regeneration, conservation and protection of forest areas, increase of mixed forest stands, increased focus on recreational management regimes in urban areas etc. The responsibility of implementation was by forest owners and with consultation and control from state authorities as means to reach the objectives. Recently, the harvesting has increased following increased demand from forest industry but also from the energy sector, with levels closing in on long-term sustainable growth level. Within the present forest policy framework it has been argued a possibility to increase

harvesting levels with between 25% and 50% in a 10-60 year period, by applying different measures.

The competitiveness of the Swedish forest industry has been based on a combination of available high quality forest resource, skilled work force, competitive energy prices, transportation solutions and efficient production and product development processes. Productivity improvements in forest management have resulted in competitive raw material prices and through value-adding product development established the Swedish forest industry as an important player in many product areas globally. But a gradual shift from the traditionally strong markets in Europe and North America to Asian countries coupled with increased competition from new raw material baskets, and state-of-the-art technologies diffused on a global basis and a mixed view of how foreign ownership affects national competitiveness are factors that affects the competitive landscape of the Swedish forest industry. During the past years there has been a consolidation of industry organizations creating a possibility to establish a uniform industry view in a number of policy areas. Emphasis is on increasingly focusing on further value-added production, new product and service development, efficient transportation systems, and active part in changing the energy system to include renewable resources to a higher degree, which is shown in the National Research Agenda (NRA). The high emphasis on R&D, and the early announcement of the NRA supporting the SRA, led to a joint industry-state financed research program for the forest industry.

Trends forestry:

- Annual harvesting levels are close to long-term sustainable level of annual forest growth.
- Improved productivity in forest harvesting operations from increased mechanization and specialization.
- Forest stand species distribution and forest management regimes are changing as a consequence of storms and with a long-term sustainable perspective.
- Raw material prices are expected to increase but the real price of end products decline. Thus a need for productivity development in harvesting, transportation and measurement. Also, a necessity to increase the annual harvest.

Trends forest industry:

- Only a modest growth of forest industry products until 2020 is expected, with increased production and consumption mainly in Asia and Latin America and small growth in Europe and NA.
- Increasing awareness of wood being a renewable material creates new market opportunities for the traditional forest industry but also intensifies competition with the forest cluster of availability of the resource.
- Structural changes in value chain towards fewer and larger suppliers and customers are affecting industry structure and company sizes.
- Continuation of internationalization of ownership and on capital.
- The forest based sector have to incorporate efficient production and manufacturing processes leading to a sustainable and integrated energy system supporting society.
- The industry must closely follow the political arena regarding issues like sustainability in society, energy consumption (EU compliance), etc.

Threats forestry:

- Annual harvesting levels exceed total forest growth in some areas affecting sustainable development, biodiversity and industry development
- Increased globalization, i.e. demand from other regions of the world increases and can/will be supplied locally.
- Climate change affecting availability and quality of raw material.
- New industrial demands (energy) of the forest resource affect long-term sustainability.

Threats forest industry:

- Lack of skilled work force and low R&D investments may hamper future competitiveness of forest industries.
- Climate change is mentioned as a global issue and should be dealt with global measures. It will affect the industry as a threat i.e. increased demand for other purposes, but also as an opportunity i.e. improve profitability in the sawmilling industry having a new customer for by-products.
- The multiple demands on forests as a renewable resource, i.e. using forest products for energy vs. wood products
- Competition from regions with low-cost labour and growing forest resources.

Opportunities forestry:

- Possibilities to increase production by pre-commercial thinning, fertilization, new management regimes, etc. without limiting environmental and bio-diversity aspects.
- Multiple uses of forest resource improves profitability of forest owners
- Forests as renewable resource facilitate opportunity to mitigate climate change, support changes in energy system based on renewable aspects.

Opportunities forest industry:

- Forest products as energy source positively affects sawmilling industry but possibly negatively the pulp and paper industry.
- Creating new business opportunities (product and services) with environmental and renewable aspects as key features.
- Growing awareness in society of the forest industry being environmentally conscious with renewable products.

***The measures and recommendations for action on how the forest and forest industry policies are implemented to tackle the trends, challenges and opportunities***:

*Forest policy*

The forest policy aims at obtaining a long-term sustainable forest resource by having two goals with equal weight – a production and an environmental. Measures and recommendations are put forward after evaluation of past measures, discussions with stakeholders, and to meet long-term objectives. Presently, one important issue is how to increase production without limiting the environmental goal. Proposed measures include increased pre-commercial thinning, fertilization, genetic improvements of tree species, reforestation of agricultural land and improved regeneration on forest land. Further to this, information and consultation from state authorities to forest owners of silviculture regimes and sustainable forest management should continue and increase.

*Forest industry policy*

From a need to redirect the forest industry from a low-cost standard products supplier to a knowledge laden industry the government, participants from industry and other related organizations put forward a strategy of how to increase the competitiveness of the forest industry. The core propositions were on R&D but also on establishments of communication and dialogue channels between participants. The strategy was divided into four sub-strategies, which in turn were divided into a number of actions/proposed programs. In total there were 26 actions within the four sub-strategies.

*Measures and actions proposed*

- Establish programs focusing on branch analyses to meet future changes, research programs to improve efficiency and profitability in the forest industries e.g. improving quality measuring of timber qualities, machining techniques, marketing measures etc.
- Establish programs to enhance foreign capital investments in Swedish forest industries, and programs focused on SME: s.

The way forward, and to overcome the focus on presently established industries, the document clearly states the need for:

- Increased cooperation between actors in the forest cluster, i.e. state and industry dialog, networking within and between branches.
- Increased focus on education and competence creation in the industries.
- Establish programs to increase knowledge of and business possibilities of bio energy, bio fuels etc.
- Furthermore, to establish a dialog today and for the future between industry and government representatives to enhance a common view on future changes, opportunities and threats. Examples of measures and implementations are:
  - Measures to establish networking and cooperation between governmental authorities and industries on national level and for national issues.
  - Similar as above but aiming at cooperation on EU level and international issues.
  - Establishment of a National Research Agenda.
  - Enhance knowledge creation and competence increases regarding product, process and business developments.
  - Programs and measures to enhance education level in the industries, thus improving the possibility for future innovations.
  - Initiate further education on wood based constructions aimed at architects, project managers and construction developers.

Further to this strategy, the forest industry and participants from research environment defined and approved a National Research Agenda based on the SRA from the Forest Technology Platform.

The NRA indicated the need to enhance the research activities within the wood value chain and activities to implement the view were:

- Establishment of a national research council
- Set-up of a National Support Area including 14 different areas for the four forest industry areas (Forest, Pulp/Paper, Wood and Bio-energy)
- Close linkages with the work on a Branch specific research program. 50/50 split in financing from industry/government and a total of 500 Million SEK (about 50 Million Euro until 2012).
- Initiate work groups for each of the 14 SA linking research and industry actors.

**Norway**

*Forest and forest industry policy overview*

The white paper on forest policy in Norway more than 30 years ago (St. meld nr. 110 (1974-75) had the following title: “Measures to increase the annual cut”. A more recent white paper on forest policy (St. meld. Nr. 18 (1984 – 85)) had the following title: “Policy towards industries in the forest sector”. Both documents aimed to support wood products industry and the markets for forest products. The main focus was on timber production and cutting. In the (84-85) document, the

importance of environment was mentioned, but few concrete strategies were formulated. The last white paper on forest policy in Norway, which is used in this study, is from 1999. It has the following title: “Value added and biodiversity – Possibilities in the forest sector”. The title tells that there has been a shift in focus on both environmental issues as well as in focusing on value added based on product innovations and in tourism development.

The national research agenda follows the last white paper on forest policy in Norway. The NRA states that “globalization, increased international competition and environmental aspects demand a change towards higher value-added products, new technology and new production methods”. There is a strong focus on forest raw materials as representing a renewable resource. The vision of the NRA towards 2030 is put forward as follows: “*The Norwegian forest-based sector plays a key role in a sustainable society characterized by a knowledge-based bio-based economy*”. To be able to fulfill the vision of tomorrow, research and mutual dependence between all actors involved in value added from the forest resources, is highlighted.

Trends forestry:

- Future trends are implicitly recognized in the way that the forest sector is foreseen to continue to be influenced by international trends.
- It is foreseen that the forest sector will meet increased demand for timber in the future.
- Harvest remains at a low level compared to total increment.
- Under expected climatic changes, wood productionwill most likely increase compared to present situation.

Trends forest industry:

- Also for the forest industry the future trends are implicitly recognized in the way that the forest sector is foreseen to continue to be influenced by international trends.
- Continued industrial concentration with fewer and larger owners and mills.
- Production processes will be more evaluated in the view of environmental issues in the future.

Threats forestry:

- A future threat is seen in the way that the forest owner will be more inactive than earlier. This is due to the fact that timber prices have decreased over the last decades.
- Also, changes in the forest owner structure are expected to lead to less active owners.
- Increased harvesting in Norway for the next decades has to come from stands in steep terrain.

Threats forest industry:

- Along with more inactive forest owners it is a focus on how to secure long-term timber supply to the industry.
- There is already a lack of qualified labor both in harvesting as well as in wood working industry and this will continue in the future.
- Norway is seen as a high-cost country and Norwegian industry has to compensate for this.

Opportunities forestry:

- The value and future role of bioenergy is put forward.
- Forestry is seen to play a key role in building Norway as an environmentally friendly country.
- The potential future for value added related to tourism industry are recognized.
- The role of forestry in mitigation of effects of GHG emissions is uncertain, but forestry may potentially play a key role.

Opportunities forest industry

- The value of bioenergy is seen as an important issue.
- Focus on wood as an environmentally friendly building material may increase demand for wood products.
- A potential future for value added related to tourism industry are recognized.

***The measures and recommendations for action on how the forest and forest industry policies are implemented to tackle the trends, challenges and opportunities***:

A new 5-year research program (Value added using forest resources) within the Norwegian Research Council was established based on the white paper from 1999. An evaluation of this program was done in 2004 where the main conclusion was that networking in the woodworking industry had increased as well as main focus on wood as a raw material was strengthened within construction and manufacturing industry. A follow up on the evaluated program is seen in the national economic development support scheme "Innovation Norway" where a program named "Wood based innovation program" is established. The program is active at present and has the following main focuses:

- Industrial construction
- Wood products and traditional wood working
- Innovation systems

The "Innovation Norway" program is targeted to the industry in the way that it is the industry themselves that has to apply for support. However, to be supported there has to be a link to research and development regarded as an innovation.

Within the Research Council of Norway a new research program has been established January 2008. The program is planned for five years and includes all kinds of; a) area based issues (e.g., tourism, environment, culture), b) wood industry issues, and c) bioenergy issues. First round of applications is done in summer 2008 and will affect most research institutions in Norway connected to forestry issues.

**Poland**

*Forest and forest industry policy overview*

The efforts to develop forest-based sector in Poland can be divided into five areas: 1) investments, 2) market dynamics, 3) employment, 4) trade and 5) research and development (Mederski et al. 2008).

Investments are mainly to increase afforestation and paper industry production. Rather than being linked to fast growth, afforestation is seen as a long investment aiming to support sustainable forestry. The majority of afforestation is carried out with the help of subsidies available from the EU. The NFP foresees an enlargement of the forest cover up to 33 % of the total land area by 2050. At the same time, conversion of the coniferous forests is planned and a level of 33 % of broadleaved species is expected by 2050.

The paper industry has developed fast after its privatisation. At the moment, paper industries operate with new technologies, it has high productivity and it is competitive in the markets. Nevertheless, despite strong paper export growth, trade deficit can be observed in many paper grades.

Gross value added in forestry grew by 75 % between the years 1996 and 2006, while at the same period the amount of harvested timber grew by 47 % and the price of timber by 28 %. There is already high demand of timber in Poland, and it is predicted that due to a growing demand of wood for energy, the competition between the forest based sector and energy industry will increase.

One trend has been that the level of employment in the forest sector has dropped while the income per capita has increased. Further growth in productivity at work is expected and to achieve this goal a wider application of information technologies is planned.

The export of Polish timber reached 0.45 % of the world total timber exports in 2005, while the imports of timber were three times higher, 1.50 % of the world total timber imports. The forestry sector does not have strong interests in developing the import of timber, but the Polish timber industry would like to gain from higher timber imports. The Polish furniture industry exports most of its production, being fourth in the list of world biggest furniture exporters. Further development of the furniture industry is worked for, though competition is fierce.

Trends forestry:

- Future objectives of the National Forest Programme, which are to be reached in three stages: by 2000, by 2020 and by 2050:
  - faster growth of population than forest area, which may cause increasing demand on current forest resources
  - forest cover is aimed to reach 30 % by 2020 and 33 % by 2050; this together with increasing supply of wood from special plantations is expected to lead into growing timber harvests
  - continuing with forest conversion from even-aged, coniferous stands to uneven-aged mixed stands
  - further regeneration of private forests of low health
  - intensification of interdisciplinary research to guarantee forest sustainability (e.g. biology, silviculture and forest utilisation)
  - growth in CO2 retention by 10 % (4.5 million tones) until 2020 and 20 % (9 million tonnes) until 2050
  - improvement of forest biodiversity: the amount of broadleaved species is aimed to increase from 22 % to 33 % by 2050, and the amount mixed stands up to 48 % of forest area by 2050; introduction of under storey in medium reach forests sites (1mln ha).

Future trends in National Policy of Ecology (NPE):
The main objective of the NPE is to guarantee ecological security in the country. Its by-objectives are:

- strengthening of management system of environmental protection
- protection of environmental heritage and rational utilization of natural resources
- securing sustainable use of renewable materials, water and energy
- further improvement of environmental quality and ecological security for the protection of citizens health
- protection of climate

Trends forest industry:

- higher integration of forest-based sector, mainly the fields of forestry and pulp and paper industries
- preparation and implementation of long-term wood demand strategy, defining national wood supply opportunities and maximum allowable cut as described in forest inventory plans

- achieving additional use of timber from urban-rural fringe and special plantations
- developing timber import-export strategy to fulfil country's forest industry needs for raw material
- developing innovations and technology to a forest-based industry to be able to use more medium and small size timber in processing
- supporting industry sector by introducing information technology solutions for highly efficient timber markets and minimising negative effects of unstable timber markets
- growing interest of industry sector in timber at the same time as societal needs for recreation in the forests are growing

Threats forestry (from NFP and NPE):
- the main issue is to get prepared for climate change by changing species composition and converting coniferous forests to more broadleaved forests and with increasing afforestation
- the number of people is growing faster than the forest area – causing growing societal demands on the forests

Threats forest industry:
- there is a risk for increasing imports which can distort domestic wood markets (implicitly recognised)

Opportunities forestry:
- NFP: growing area of forests due to afforestation of old agricultural land with the help of EU subsidies
- NPE: use of EU resources for environmental protection

Opportunities forest industry:
- wider use of small and medium size timber in wood industry

***The measures and recommendations for action on how the forest and forest industry policies are implemented to tackle the trends, challenges and opportunities***:

Forest policy recommendations for action in Poland are best described in the National Forest Programme (NFP) including short (until 2010) and long term targets (until 2050). The National Forest Programme (2005) was developed in cooperation with scientists and representatives from the Forest Research Institute, the Ministry of the Environment, the State Forest and the Faculties of Forestry in Warsaw and Poznan.

The NFP's short term target (until 2010) focuses on three basic forest functions: 1) ecological, 2) social and 3) economic. The objectives of the programme (below) are followed by information on who will be responsible for the programme implementation and budgeting.

Objectives regarding ecological functions like environmental protection and carbon sequestration:
- enlargement of forest cover up to 30 % of total land area – National Programme of Forest Cover Enlargement 1995-2020 (Puchniarski, 2000) and alteration of post-agricultural land to forests through afforestation – funding from national (the State Forests) and EU sources to attracts private sector investments
- improvement of water retention in the forest – funding from the State Forest budget and government subsidies from Environment Protection Funds
- prevention of erosion and soil degradation, recreation and use of post-agricultural areas – changes in silvicultural practices and forest operations
- changing species composition by using species suitable for site specific conditions – changes in silvicultural practices by the State Forests

- increasing carbon sequestration of the forests – enlargement of forest cover and changing species composition

Objectives regarding social functions like forest education, tourism and recreation:

- education of local societies that forestry in Poland is sustainable and multifunctional, respecting environmental protection and the interests of society – use of Forest Promotional Complexes (the State Forests administrational units and budget),
- building forest infrastructure more friendly to tourism and recreation – the State Forests

Objectives regarding economic aspects like wood production and wood processing: influence state forest and private sector:

- increase in forest growth both in wood and non wood forests products' production – enlargement of forest cover
- improvement of economic effectiveness of the forest sector – development of information technologies and work efficiency
- participation of the forest sector in the development of rural areas – protection of small sawmills by guaranteeing their wood supply and stable timber prices
- improvement of forest practices in the private sector – free service of the State Forest administration for private owners to help them to learn best silvicultural practices

**Austria**

*Forest and forest industry policy overview*

Austrian wood industries have undergone a business concentration process while the exploitation of forests has increased on both domestic and international levels. The wood production generates more value added products than before. At the same time, internationalization and structural changes (outsourcing, machinery, etc.) have reduced the amount of SME companies. The increased value generation in timber industry (especially in furniture) provides new opportunities, and wood product marketing is regarded as one prominent future area.

The globalisation development on regional level is getting more intense. The import of the roundwood is increasing to match with the growing demand. The competition on both, the production location and raw material sourcing has grown. Biomass utilisation for energy generation and the use of forests for societal purposes have increased during last decades. New innovative, forest-based bio-energy products need to be developed. Although growing stock has increased on yearly basis, approximately only 60 % of annual increment is used. There is potential for more profound usage of the forest reserves, but also limitations, due to small-scale ownership structure.

New markets provide opportunities, especially in the case of the paper markets. They also provide possibilities in reducing trade distortions. The changing the development of the forest owners, partly resulting from change of generation, has created a positive cooperation between enterprises and forest associations. At the same time, it has resulted in a declining interest in the forest management and forestry.

There's a need to create new opportunities and potential markets for non-wood goods, such as water and other forest related services. In addition, there exists a possibility to further develop transport logistics and related cooperation between the forest-based industry and the forestry sector.

Globalization, developing information technologies, new economy and wood substitutions set up biggest challenges for forest-based industries. Especially increasing costs are problematic. The intensified competition on production, processing and raw materials increases the problems. Demand for the energy provides both challenges and new possibilities to biomass energy suppliers and traditional industries.

Decrease in the operational personnel, a process that combined with the structural change of the forest ownership induce a question on how to maintain and support forestry management and know-how. There's a need for development of wood supply, appropriate education and vocational training with more favorable income framework conditions.

Trends forestry:

- Usage of forest biomass for energy generation
- Recreation institutions, special tourist offers, intensified marketing of the right of hunting, protection against natural hazards (torrents and avalanche)
- Declining interest in forestry by forest owners
- Continuing relocation of production, internationalization of industry (regional globalization)
- Structural change of forestry
- Innovation in technology for production
- Change in the values and methods of the forest owners (change in forest management, novel management systems: co-operations)

Trends forest industries:

- Strong emphasis on bio-energy
- Development of composites and new innovative products (such as waterless paper)
- Increment of district and bio-energy heating
- Concentration on process innovation in means such as improving and making the production management more efficient
- Structural change of forest industries

Challenges forestry:

- Need for maintaining and increasing forestry "know-how".
- Increasing roundwood competition
- Shortage of suppliers of raw materials caused by an increased competition, wood processing and energy industries
- Variations in roundwood supply and quality
- Decreasing economic potential of forestry
- Changing market conditions (globalisation) makes adequate adaptation necessary.
- Increasing need for further rationalisation and improved efficiency

Challenges forest industries:

- Scarcity of resources and cost of material
- Challenges related to energy optimization
- Challenges to respond environmental requirements
- Securing the environmental and recreational requirements for the use of forests

Opportunities forestry:

- Timber product marketing as a main opportunity for forest enterprises
- Increase on forest usage by the whole society
- New "hope markets" for new products, such as water supply, recreational facilities and specialty tourism
- The developing of the new cooperative networks between forestry and forest industries

Opportunities forest industries:

- Opening of the new markets (especially in case of paper)
- Wood composites are strongly highlighted
- Increase and development of renewable energies
- Further development of promising products, such as specialty (waterless) papers

***The measures and recommendations for action on how the forest and forest industry policies are implemented to tackle the trends, challenges and opportunities***:

*Forest Policy*

The Forest Programme is structured along seven forest-political "thematic areas". Each of the thematic areas includes a set of goals, principles and measures that are to be implemented by means of a *continuously* updated Work Programme. The decisive organ is the *Forest Forum*, of which task is to continue the harmonisation of interest in forest-related matters, updating the Work Programme and evaluating the measures taken, as well as addressing new issues of importance. The WP lists 84 *measures*, but in reality there are no clear guidelines how the implementation of the measures shall take place, nor are there any additional funds made available for the implementation of forest dialogue measures.

Some implemented measures of the Forest Programme are e.g.:

- Development of monitoring and evaluation systems and creating new alternative products to be used in climate protection
- Evaluation and adapting of legal framework for pollution control, and soil and forest protection
- Further developing and creation of relevant cooperation programmes, alternative income sources, etc. to support forest management and sustainable forest management.
- Harmonizing Austrian forest policy with European legislation (i.e. Forest Strategy and Forest Action Plan)
- Implementation of Austrian Neobiota Action Plan.

*Forest industries*

The Austrian NRA has a middle- to long-term perspective, and will be regularly updated by the NSG. The NRA focuses on lobbying Austria's research needs on the European level, and it serves as a basis for strategic discussions with the national bodies responsible to generate research programs and to relevant policy makers and funding agencies. The NRA is dedicated to attract talent and technology to all participants in the forest-based sector in Austria but, especially, it serves as a basis for strategic discussions with the national bodies responsible to generate research programs and to relevant policy makers and funding agencies.

- Developing ways to deal with raw material competition and resource shortage from the wood working industry perspective such as resource efficiency, as well as improving recycling technologies, materials and production efficiency
- Improving the recycling of waste paper, use of secondary fibres, auxiliary materials and chemicals used in paper production
- Creation of and research on new products, technologies and replacement of fossil based, not renewable synthetic materials
- Development of holistic scenarios, models and solution approaches for the optimized use of forest-based raw material

## Romania

*Forest and forest industry policy overview*

Romania has 6.3 million ha of forests and the annual harvested volume of timber is approximately 16-18 million m3. Only 40 to 50 % of the annual growth is harvested since the total annual growth is 34.6 million m3, with an average volume per hectare of 218 m3. The timber for industrial use accounts roughly half of the annual removals (8 to 10 million cubic meters). The domestic timber supply seems to largely satisfy the needs of forest industries and only less that 0.4 million cubic meters of timber is annually imported, mainly from Ukraine. However, because of the lack of forest transportation infrastructure (forest roads) and inappropriate harvesting technologies, about 2 million ha of forests are not accessible and 1.9 million m3 of mature, exploitable timber remains unharvested each year.

On the other hand, illegal logging is estimated to reach up to 10 % of the total harvested volume per year. A regulatory, restrictive legal frame enforces the same rule of sustainable forest management irrespective to the form of ownership. Forests have to be managed by an authorized forest district and have to be used according to a forest management plan. Long rotation ages (over 100 -120 years), extraction of small quantities of timber at once, limited share of clear-cuts and compulsory regeneration of stands after final cutting are the main rules for forest management. New forest code adopted in 2008 states that forest management should be "primordially" ecologically sound. During the latest two years, the ministry has developed a system for compensating the economic losses of forest owners in case where harvesting of timber is restricted because of the protective functions of forests. Still, the over-fragmentation of private forests (1.5 million ha) and the absence of the extension services hamper future evolution of the policy frame to be less regulatory as now.

Romanian forest industry has faced many challenges during the latest two decades: timber prices liberalisation in 1995, privatisation, restructuring of the State owned forest enterprises, changes in the forestland ownership deeply affecting wood supply, and lack of investments. General economic growth of Romanian economy and supporting public policies in the period 2005-2008 (deregulation, anticorruption, attracting foreign investment, income taxation) significantly improved business milieu also in forest industries. Romanian integration in the EU in 2007 has had also a positive influence on forest industries. For example, the wood working industry (excluding the furniture) encountered 7 % annual production growth in 2006 and 2007. This came under the influence of an increased domestic consumption and several major investments that took place or were announced. Timber industry has been a target for 5,7 % of total foreign investments in Romania in the latest two years. It is envisaged that the overall role of the forest sector (forestry, timber processing and furniture manufacturing) will increase and that their contribution to the national GDP will reach 10 %. Currently, all wood based industries and furniture manufacturing represent 10 % of the number of employees from the industry and around 10 % of the Romanian exports.

Despite the strong position in the Romanian economy, the timber industry has not had strong role in Romanian industrial policies. Only the furniture industry, due to its importance in the Romanian export, has been considered as a distinct sub-sector in the Romanian Industrial Policy and in the National Strategy for Export. For example, programs supporting branding in furniture industry and the evolution towards more value added product were launched in the latest two years. For the rest of the timber industry, the same goals than those set up for the general manufacturing industry apply, e.g. improving the economic competitiveness and the development of the knowledge-based economy, development of the infrastructure and development of the human resources. In realistic terms, the considerable technological lag in comparison with the Western

European countries fosters Romanian timber industries to be rather technology import than innovation oriented. On the other hand, the 2006-2008 investments in new and competitive technologies in sawmilling, MDF (medium-density fiber-board) and particleboard, veneer and plywood has raised questions on the availability quality raw material for these industries.

Trends forestry:

- Explicitly, the policy documents fear that the extension/deforestation of forests via illegal logging will continue as has happened over the last 15 years. Pressure on forests is expected to increase. The forest policy documents emphasise the use of plantations for energy and rural needs; and of utilization of wood waste as fire wood in order to reduce pressure on industrially valuable timber resources.
- Explicitly, again, the forest policy focuses on the increase of forest area; creation of forest protection belts round arid areas; and restoration of degraded soil.
- The implicit assumption about the future is that there will be the same development, context, and evolution of socio-economic factors than has been in the past.
- There is a realistic hope that the situation of the transportation infrastructure in the forests will improve.

Trends forest industry:

- It is expected that the furniture industry will continue to develop, but the competitiveness will decrease. The furniture industry is currently still low-tech, and it will be necessary to search more value added products and to incorporate more design and innovation in the furniture products in order to maintain the current position in the markets.
- It is expected also that the re-structuring of the forest industry following the new investments will continue; medium sized sawmills are supposed to close down, as only larger companies and very small and flexible are supposed to survive.
- Although the general Romanian policies tries to nationally develop the innovation based entrepreneurship in the period 2007-2013, the introduction of new technologies and the increase of the forest industry sector's competitiveness will be fostered by new green field investments that are based on foreign capital.

Threats forestry:

- Future threats are mentioned indirectly in the formulation of the National Forest Programme (2005): "The low level percentage of forests in the plane area is correlated with frequent and long dried period, on the same manner that the deforestation in hills area and massive cuttings in the mountain-forests area are correlated with phenomena of torrents and soil degradation".
- Undeveloped and uneven distribution of forest road network.
- The illegal logging and unsustainable forest management practices in the private forests.
- Extension of the area of protected forests and implementing the Directives for Natura 2000, which is believed to significantly restrict timber harvesting.
- Natural hazards such water flood, soil degradation and drought, desertification and increasing windfall damages.

Threats forest industry:

- The low efficiency of the timber value chains; too low valued added or too low value retained by the operator.
- The low level of public support and facilities for implementing harmonised EU legislation and for integration of environmental protection in the forest management and wood production practices.
- Appreciation of the Romanian currency represents a threat for export dependent furniture industries.

- The lack of high quality timber.
- Declining availability of labor for harvesting and forest works.
- The lack of transparent information on timber market prices and the lack of information on timber availability from private forests.
- Lack of dialogue between the main stakeholders, and between the industry and the government. Low level of cooperation between the industry representatives.
- Lack of the forest sector integration and access to the Western European markets, mainly due to quality reasons (except for furniture products).

Opportunities forestry:

- The only opportunity identified explicitly in the policy statements is afforestation, that is seen a mean to increase the forested area, which can contribute the supply of raw material for forest industries and local communities in the long run.
- Several loans contracted by the Government to support the construction of forest roads.

Opportunities forest industry:

- Raw material availability (including of wood varieties appreciated on international markets like Europe, USA, and Asia) associated with still low labour costs.
- Boom in the construction and real estate sectors, which has grown with more than 20 % per year during the last 5 years;
- The investments of multinational companies have started to stimulate local clustering of timber processing companies.
- Governmental programmes fostering research and development (R&D), the financing of SMEs, the development of innovation incubation services and the decrease of the barriers for the establishment of spin-off companies.
- The geographical proximity to EU customers, particularly important for the furniture industry (83 % of the furniture export is sold to the Western markets).

The measures and recommendations for action on how the forest and forest industry policies are implemented to tackle the trends, challenges and opportunities:

- Public policies for industry and forest policy ask for imperative development of research and the transfer of research results into the benefit of industries development and competitiveness.
- Better use of timber in the chain, and harmonization of timber flows.
- Improved practices in public-private partnership, increasing stakeholder participation, more and regular dialogue amongst the stakeholders on issues concerning the forest sector development.
- Revision of legal norms concerning regeneration cutting, thinning, harvesting and the construction of the forest roads.
- Supporting the SMEs, via extension services and bank loans tailored for their needs.
- Implementation of an electronic system for timber traceability and the National plan to fight illegal logging.
- Public actions to stimulate the association of the private forest owners, and the association of the economic agents from timber harvesting, transportation and trade in professional or entrepreneurs organizations.

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