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# Innovation Policy, innovation in policy: policy learning within and across systems and clusters

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# 8. Innovation policy, innovation in policy: policy learning within and across systems and clusters

**Claire Nauwelaers and René Wintjes**

## INTRODUCTION

This chapter is an attempt to open the black box of innovation policy-making in Europe. Information on the content of innovation policies deployed throughout Europe becomes increasingly available, yet little is known about the process of building and improving innovation policy. Because there is no optimal innovation policy model and no optimal portfolio of policy instruments, the policy-making process itself is a process of innovation; a process of creative destruction and new combinations. Since policy design, implementation and governance issues are as important as the content of policies, we can address policy not only as a product innovation, but also as a process innovation and organizational innovation. And if policy-makers can transfer policies to other policy-makers or users, e.g. internationally, we can also address it as market innovation.

This chapter draws on a range of studies and projects dealing with innovation policy-making in Europe. We discuss this policy-making in terms of innovation and learning, and apply it to cluster policy. The focus of the analysis is on modalities of policy learning, on the role of intra-system versus inter-system or international learning and on the case of cluster policy as a particular example of a popular policy innovation to illustrate the points.

In the first section, we discuss the concept of policy learning and propose a typology of modes of policy learning adapted to the innovation field. We consider a number of methods used by policy-makers to build up innovation policies and their potential to enhance policy learning. We investigate in particular the potential and limits of trans-national learning in the development of contemporary innovation policies. In the second section, we examine cluster policy as a case of policy learning. Starting with an overview

of the variations around the cluster concept, we provide an analysis of cluster policies at play in Europe and discuss their nature and role in innovation policy. We investigate the contribution of various modes of policy learning to improve the governance of cluster policies. The chapter ends with an indication of possible ways forward to improve the policy-making for innovation in Europe, emphasizing the need for more innovation in policies (as opposed to imitation).

## POLICY LEARNING FOR INNOVATION

In a hypothetical situation of perfect information and communication, policy learning would not constitute a big issue. It would be easy to select and adopt appropriate policy solutions for a given innovation system. The pool of international experience in innovation policy would provide reliable information for policy-makers, due to the transparency of conditions in which they operate and due to the perfect proof of the impact of all policy aspects. Innovation policies would easily converge towards international best practice.

However, uncertainty prevails concerning innovation as well as innovation policy. Especially regarding knowledge and innovation, neither markets nor policy-makers are perfect in telling what is best. So, there is no optimal policy, no optimal innovation, no best system and no best practice. There are of course systems that are performing better than others but trajectories and pathways to success are diverse, making the search for universal 'best practices' irrelevant. Also the link between innovation policy and innovation performance is not well understood, precluding automatic transfer of supposed best practices.

Therefore, the most ambitious policy goal is improvement and it requires policy intelligence to promote, implement and evaluate policy learning activities. Learning from one's own experience, whether successes or mistakes, is probably the most valuable for improving policy performance. However, external lessons can complement this learning process at several moments along the policy cycle, ranging from identifying policy needs to policy design, implementation and policy evaluation.

### The Nature of Policy Learning for Innovation in EU Member States

Unlike many other policy areas, innovation is a young policy field and there are no widely accepted and thoroughly tested models for innovation policy. Policy-makers are learning-by-doing and also learning-by-interacting: the

rise of innovation policies has been coincidental with the rise of practices of exchanges about policy-making. The latter trend is visible in bilateral exchanges between policy-makers as well as in multilateral exchanges, fuelled by European Commission initiatives (started in the mid 1990s with RIS-RITTS or PAXIS at regional level, EIMS-Network, followed by Trendchart and recently PRO-INNO and INNOVA), by OECD platforms such as the STI-TIP group, or international policy learning forums such as the Six Countries Programme. All these initiatives and platforms originate from the idea that there is a need for supporting policy-makers to expand their understanding of innovation systems and of the way policies can influence them.

Experience with innovation policy-making in European Member States shows that policies are mainly the result of a heuristic, learning-by-doing process, influenced by history in policy implementation: policies are implemented as a follow-up of existing policies (only seldom informed by evaluations of their effectiveness and efficiency). Other driving forces also determine their content: pressures from stakeholders are often a key element that leads to policy changes; some policies are implemented as responses to new policy considerations arising from newly identified problems or opportunities in the National Innovation System, either on an *ad hoc* basis or as a result of studies and key figures. Influences from international experiences and new policy fashions are also playing a role. These driving forces, which are often at play simultaneously, combine to deliver the 'policy mix', which appears an 'ex-post reality', rather than as a deliberate construct with a view to enhancing synergies and effectiveness of the policy system as a whole (Nauwelaers et al. 2006).

This raises the question of the modes of learning at play in innovation policy and whether these are adequate to the challenge of improving innovation policies.

Traditionally, changes in policy were merely explained by conflict-based theories. Policy-making was called (central) planning and voting for alternative policy-makers in democratic elections is still important in explaining changes in policy. But, there are also other governance mechanisms at play. According to Heclo, 'politics finds its sources not only in power, but also in uncertainty – men collectively wondering what to do . . . [P]olicy-making is a form of collective puzzlement on society's behalf' (Heclo 1974, p. 305). A neo-liberal answer would be to let markets decide what to do. But markets as a strong decentralized selection mechanism cannot be original and spontaneous concerning problem-solving tasks (Marengo and Dosi 2005). Since, especially for policy regarding knowledge and innovation, the level of uncertainty is very high, Dunnewijk and Wintjes

(2006) introduce 'serendipity' as an additional major policy-making mechanism, emphasizing the importance of experimenting and learning-by-doing.

But, does policy learning imply that there is accumulation of knowledge; is there a growing body of understanding in policy making? What kind of knowledge and techniques are needed to improve policy? And how is the relevant knowledge and know-how generated, accumulated and diffused or transferred?

Comparing policy learning to technological advance, it can be argued that policy improvement also proceeds through an evolutionary process, 'in the sense that at any time there generally are a wide variety of efforts going on to advance of technology, which to some extent are in competition with each other, as well as with prevailing practice. The winners and losers in this competition are determined through an ex-post selection process' (Nelson 2003, p. 914). The same holds for the advance of policy, but as Nelson shows, the advance of human know-how has been uneven. In fields such as education or policy-making, the advance has been very limited. One of the reasons is that to a considerable extent what works and what does not work, and what works better, must be learned through actual experience and actual competition. The policy innovations and learning processes are social and cultural and, therefore, very difficult to de-contextualize and re-contextualize. However, policy worlds are full of best-practice studies and international benchmarking. Accordingly, in political science most attention is given to concepts such as policy convergence, policy diffusion and policy transfer (Knill 2005).

Synthesizing various strands of literature dealing with policy learning, Bennett and Howlett introduce useful distinctions between various types of policy learning, the subjects and objects of learning and the policy changes expected (Bennett and Howlett 1992).

Table 8.1 underlines the diversity among learning processes that leads to changes in policy paradigm at one extreme, or changes in policy instruments such as programmes, at the other extreme. The constituency involved in the former case is much broader than the one involved in the latter. Hence, social learning (Sabatier 1993), focused on ideas, is a much wider process than lesson-drawing, focused on instruments (Rose 2001). A third type of learning refers to government learning (Etheredge 1981) or political learning (Heclo 1974), involving state officials and focused on organizational changes.

In the domain of innovation policy, one could hypothesize that a logical sequential process has taken place over time between the three types of learning, starting from social learning, followed by lesson-drawing and then by government learning.

*Table 8.1 Types of learning and policy change*

| Learning type | Who learns | Learns what | To what effect |
|---|---|---|---|
| Government learning | State officials | Process-related | Organizational change |
| Lesson drawing | Policy networks | Instruments | Programme change |
| Social learning | Policy communities | Ideas | Paradigm shift |

*Source:* Bennett and Howlett (1992)

A paradigm change occurred towards the beginning of the 1990s when innovation started to establish itself as a new policy field. Influential documents such as the *Green Paper on Innovation* by the European Commission published in 1995 played a role in the progressive diffusion of the idea of innovation as a key ingredient of competitiveness within a wider policy community. The new idea of innovation as a systemic rather than linear process percolated in policy cycles and created a new space for the establishment of innovation policy as distinct from R&D policy. Scholars studying innovation and innovation systems contributed to legitimate innovation as a new policy field. This trend implies the setting-up of new policy instruments: the breadth of discussions on possible instruments gradually expanded across policy networks, involving practitioners, but also analysts and evaluators. More recently, the recognition that the organizational aspects of policy-making are of key importance is growing among policy circles. The rise in evaluation practices, the heightened attention of State officials on formula such as Councils in charge of overseeing innovation policy design and defining key orientations are visible aspects of this type of policy learning.

Although these three learning types may have received a different emphasis since the 1990s, their sequential character is debatable: sometimes the establishment of instruments precedes, or contributes to, the paradigm shift; organizational changes might also contribute to it and provide feedback effects to lesson-drawing from instruments. State officials are also increasingly participating in policy networks and the blurring of frontiers between executing agencies and ministries is another factor that links the three modes of learning to each other. Hence, a lot of interactions occur between these three types of learning, and simultaneity is likely to be present.

The next question following the ones of who, what and to what effects policy learning takes place, is the question of how policy learning occurs and what kind of knowledge is involved. Table 8.2 proposes a typology of modes of policy learning by making a distinction between, on the one hand, several policy levels (the policy actor, the system and the inter-systems levels) and, on the other hand, a distinction according to the extent to which the knowledge concerned is tacit or codified. Based on this typology several methods and tools for policy learning are distinguished.

Improving policies involves policy learning from basically two different sources: one's own policy experiences (intra-organization), and those of others, elsewhere (inter-organizations within the same system or inter-systems). In other words, policy-making relies on learning-by-doing and learning-by-interacting.

*Table 8.2 Modes of policy learning in innovation*

| **Policy learning** versus **knowledge base** | **Intra-organization learning** in policy making/impl. institution | **Intra-system learning** with users/partners in innovation system | **Inter-system learning** international comparison |
|---|---|---|---|
| **Tacit knowledge** | 1. Experience, learning-by-doing, learning-curve, intra-organizational | 3. Inter-organizational learning, people mobility, sharing visions | 5. International discussions, peer reviews, mobility, exchanging |
| **Codified knowledge** | 2. Internal monitoring; budgetary, administrative targets | 4. Evaluations, national monitor and evaluation system | 6. International benchmarks, using (policy) scoreboards, databases |

*Source:* Wintjes and Nauwelaers (2002)

Intra-organization policy learning (first column in Table 8.2) refers basically to learning-by-doing, e.g. where a policy-making unit or a policy implementing institution learns from past mistakes or successes. Most of the accumulated knowledge will not be written down on paper, or codified in any other way, but rather remains in people's heads or is embedded in a team of people who deal with the everyday implementation of the policy (1 in Table

8.2). Part of the relevant knowledge and policy learning activities may be implicitly or explicitly documented, e.g. in an internal evaluation report, or documents produced in the framework of administrative or financial procedures (2 in Table 8.2). This is a very traditional and widespread way of learning in innovation policy. The important point to be made here is that the lessons learned relate to an element of the innovation system, but are not suited to inform about the functioning of the system as a whole.

There is also significant inter-organization potential for policy learning between actors involved in a national or regional innovation system (second column in Table 8.2). This intra-system learning refers to policy learning from policy-users and partners in the context of the targeted innovation system. An example of an important instrument concerning innovation policy is the RIS (Regional Innovation Strategies) and similar kinds of policy initiatives, which address the supply and demand side concerning innovation policy and the involved actors in a specific region or nation. Favouring mobility of actors between various organizations in the same system is also a way to enhance learning within a system, based on tacit knowledge embedded in people. Exchanging tacit knowledge between the actors involved may result in a shared vision on what is needed and what could be called good practice in the context of a specific innovation system (3 in Table 8.2). Part of the relevant learning activities may be based on, or result in, codified knowledge, such as documented in national evaluation reports or scoreboards (4 in Table 8.2). Intra-system learning practices have gained popularity with the change of paradigm towards innovation as a systemic process and the adoption of an innovation system perspective for policy-making. However, most of the documented evaluations are project- or programme-specific, e.g. a report on the impact of a national R&D tax measurement. As Guy and Nauwelaers (2003) argue, it is seldom the case that national policy evaluations cover several related, interacting innovation policy schemes. The format of the National Reform Programmes adopted at European level, linking several policy fields to broader objectives and focusing on leverage effects of combinations of policy instruments, is an attempt to improve this systemic approach.

Finally, the last column in Table 8.2 features the potential for international modes of policy learning. At the stage of policy design, foreign sources can provide new ideas and the rationality for stimulating trans-national policy learning. The idea is to prevent multiple efforts in reinventing the same kind of innovations in policy design. Ex-post trans-national policy learning involves comparing evaluations of policies. Evaluations and impact assessments can be used to see how domestic policy results compare to results of foreign policies and to identify good policy practices. According to

Radaelli (2004; 2005) this policy learning is hampered by the fact that the different political contexts in Europe shape the implementation, evaluation and appreciation of certain policy instruments. Again this learning can occur on a more informal mode, involving tacit knowledge exchange through peer reviews, visits, face-to-face contacts (5 in Table 8.2) or more formalized methods based on the use of codified knowledge using databases or comparable indicators in the forms of scoreboards and the like (6 in Table 8.2).[1] This inter-system mode of learning is given increasing priority in Europe, and it is a major aspect of interventions by the European Commission. A lot of effort is being deployed to support both formal and informal policy learning modes, e.g. referring to the Open Method of Coordination, and especially to the activities under the Innovation Trendchart and ERAWATCH.

A crucial implication of the identified typology of policy learning as sketched in Table 8.2 is that it is essential to create linkages between the various policy learning activities. Notably, it is often the case that knowledge gained through codified sources needs to be complemented by tacit sources in order to compensate for deficiencies in existing indicators or data; it is hardly possible to engage in trans-national policy learning without systematic policy learning activities taking place at a national level; and systems evaluations would need to rest on a good understanding of individual actors, situations, hence, creating complementarities between intra-organization and intra-system learning.

Because of their growing presence in the innovation policy learning battery of tools, the next section focuses on international policy learning practices and discusses their potential and limits, as well as perspectives for improvement.

## Methods for Trans-National Policy Learning in Innovation

The Open Method of Coordination (OMC), adopted at European level in the framework of the Lisbon strategy, is a new, soft method aiming at policy convergence across the Union, using non-binding methods and voluntary moves from Member States. Peer reviews, comparisons and benchmarking are the main tools used, and the European Union's role is to offer a platform for exchanges rather than enacting laws. Hence, the OMC acts as a trigger for international policy learning, and significantly so in the area of innovation.[2]

The next paragraphs provide a discussion of the following three methods of enhancing inter-systems learning in the area of innovation policy:[3]

1. Peer reviews, as an example of a method mainly based on tacit

knowledge exchanges (5 in Table 8.2);
2. Policy benchmarking, as an attempt to codify knowledge to be used for international policy learning (6 of Table 8.2);
3. People mobility, learning-by-visiting methods.

We then conclude subsequently on the potential and limits of trans-national policy learning for innovation policy.

**Peer reviews**

The peer review is a major and increasingly adopted tool in implementing the OMC and, more generally, a relevant tool for inter-system learning in innovation. It is a review among peers in the form of a personal exchange (either formal or more informal) of knowledge that is tacit to a large extent.

The OECD defines peer reviews as follows: 'the systematic examination and assessment of the performance of a State by other States, with the ultimate goal of helping the reviewed State improve its policy making, adopt best practices, and comply with established standards and principles' (OECD 2002, p. 4).

Peer reviews are used widely at OECD in several policy areas such as unemployment, development assistance, economic policy, education, etc. Peer reviews are used in the area of trade policy by the WTO, for environment policies at the UN, for labour market policies in the EU, etc. Already since the early 1960s *Science Policy Reviews* have been conducted at OECD, supplemented by *Technology Policy Reviews* in the 1970s, and *Science, Technology and Innovation Policy Reviews* since the mid 1980s (Aubert 1997). Peer reviews started to be applied to innovation policy both by the OECD and the EU in the middle of the first decade of the 2000s (OECD 2005; or Georghiou et al. 2003; and a series of peer reviews conducted between 2004 and 2007 under the auspices of the European Commission within the framework of its research policy).

The main characteristics of the method are contained in the following five points:

1. The voluntary engagement: both reviewers and reviewed actors decide to undertake the exercise on the basis of their genuine interest;
2. The goal-oriented approach: peer reviews go beyond pure analysis as they aim at improving practices;
3. The reciprocity and shared interest of all parties towards the exercise: normally, the same actors would be likely to act as reviewed or reviewers at different occasions;
4. The frequent presence of an intermediary, neutral organization (such

as the OECD Secretariat), acting as an organizer of the exercise (with sometimes a heavier role in analytical work);

5. A three-phase process, consisting in a preparation phase (background analysis by the reviewed country), a consultation phase (dialogue and analysis between reviewers and reviewed, often including visits), and a recommendation phase (adoption of the peer review report, often through a high-level meeting and diffusion).

The typical output of peer reviews is an evaluation report, describing the situation, the areas of strengths and weaknesses and proposing recommendations for progress. Often the results are made public and discussed widely in the media.

Peer reviews constitute an interesting method of enhancing trans-national policy learning in innovation. A first advantage lies in the credibility of recommendations produced by peers (as opposed to recommendations by consultants, external to the policy-making process), resulting from so-called 'peer pressure': these are more likely to be intelligible and directly applicable in the policy-making process. Second, the dialogue created between reviewers and reviewed helps foster an understanding of the working of the innovation policy system, taking into account the tacit knowledge held by reviewed policy-makers. The learning process can therefore become multilateral rather than unilateral. The opportunity created for policy debates in the reviewed country may be as interesting as the results achieved (recommendations implemented). Third, the reviews are often a continuous process. Peer reviews are normally conducted at several points in time, thus allowing measurement of progress and analysis of trends. Continuity also helps build trust and develop further cooperation practices beyond the peer review itself. It contributes to the creation of a community of interest between a range of policy-makers. Hence, peer reviews might be conducive to paradigmatic changes by involving wider policy platforms or communities in the process (the 'social learning' line in Table 8.1).

However, there are also limitations in peer reviews as a method for trans-national policy learning in innovation policy. The main one relates to the reliance on established norms and principles or benchmarks: peer reviews have generally been used to assess distance and progress towards relatively well articulated targets and norms (e.g. share of development aid in GDP or rates of emission of certain substances), which do not exist as such in innovation policy. The lack of sound evaluations of policy instruments, as mentioned above, limits the use of 'best practice'-oriented peer reviews. Hence, the process of assessing the effectiveness of innovation policies might be too reliant on the skills of reviewers and lack robustness. Another

limitation inherent to the method is the difficulty that reviewers have in gaining sufficient knowledge of the context in the reviewed country. Practical difficulties also arise, such as the heavy time investment needed to carry out the exercise properly and the difficulty finding experienced policy-makers to invest the necessary time.

Experience in conducting peer reviews in Europe indicates that the following factors are critical for the method to be successful:

- The choice of reviewers is a key issue since the incorporation of lessons from foreign experience will occur through their own capacity for applying such lessons to the particular context of the reviewed country;
- The level of trust between policy-makers from the reviewer and reviewed countries and their strength of the commitment to the exercise (in particular, the willingness of the reviewed country to take the results into account in policy-making) are important determinants of the quality of the exercise;
- The quality of dialogue existing in the reviewed country between actors of the innovation system and the capacity of policy-makers for bringing the results of the exercise in the policy-making process are pre-conditions of success;
- The existence of previous analyses and evaluations of the topics subject to peer review in the reviewed country is another success condition.

**Policy benchmarking**

Benchmarking is a technique developed in the business world, aiming at comparing the performance of a company with that of the lead companies in their branch of activity with the view of adapting strategies and structures according to the 'best in class' practices. The ultimate goal of benchmarking company performance is to introduce changes in the benchmarked company, which lead to improved results (in terms of profit, growth, market shares, etc.). This type of benchmarking can be referred to as 'transfer of best practice'.

Transposed to policy, the ultimate goal of benchmarking would similarly be to introduce changes in policy practices so that improved policy 'performance' happens as a result. In a mechanistic fashion, this would involve analyses and comparisons with best performing countries, and borrowing from those models. However, in the realm of innovation policy there are fundamental problems with the idea of a transfer of practice from the 'best in class' model.

A first problem is that, because of crucial differences in the contexts in which they operate, policies cannot directly be compared to each other. Innovation policies form a system in which the various instruments interact with each other and each specific policy mix reflects the nature of problems and potentialities of the innovation system in which it operates. In other words, policies are context-dependent and this covers a multiplicity of aspects ranging from innovation performance, orientation of the industrial fabric, degree of openness of the system, historical legacy of policies, cultural aspects linked to innovation, institutional rigidities, etc. Therefore, as already mentioned, there is no such thing as a universal best practice policy in innovation from which others could borrow. Furthermore, what is important is the policy mix, not each individual policy instrument (Guy and Nauwelaers 2003). Instruments applied in isolation are unlikely to produce the required effects; rather, it is the interaction between various instruments, as well as with their surrounding environment, that will influence the innovation outcomes.

A second reason why 'best practice' innovation policies cannot be identified is because the links between these policies and innovation performance are not straightforward. Problems of attribution (what is the result of policy and what is caused by other features of the innovation system), the general lack of sound evaluations of policy impacts, and the mentioned necessity to take into account interactions between multiple policy instruments rather than the effects of each in isolation preclude the drawing of direct relationships between a given policy system and overall innovation performance (Soete et al. 2002).

Nevertheless, while there is no 'best practice' available for innovation policy, there are however some policies that have proven to work well in their context, i.e. there are context-dependent good practices. On this basis, scholars involved in innovation policy analysis have developed a softer notion of benchmarking, based on 'learning-by-interacting' processes rather than on a 'borrowing from best practice' notion (Lundvall and Tomlinson 2000; Tomlinson and Lundvall 2001). In this approach, which they call 'intelligent benchmarking', an exchange of experiences takes place between policy-makers, who are then pushed to analyse and investigate their own policy practices in the light of the 'mirror' offered by practices deployed elsewhere. No best practices are found, but lessons from successful foreign policy approaches are incorporated in the policy thinking of the country undertaking the benchmarking exercise.

Hence, the objective of policy benchmarking is to create a well-informed exchange of experiences between policy-makers in order to widen the range of policy options, open new windows of opportunities, improve the

understanding of framework conditions under which policy operate, learn from successful experiences and, ultimately, provoke changes in own policy practices.

Benchmarking policies is a method that has been applied on a large scale in the European Union in the area of RTD policy, after the Lisbon summit. Following the decision to create the *European Research Area*, the European Commission has set up five high-level benchmarking groups, composed of policy-makers, each supported by a network of experts, with the mission to develop methods, indicators and policy recommendations on how to benchmark RTD policies in various areas (e.g. human resources, private – public investments, productivity of science, promotion of RTD culture and public understanding of science, impact of RTD on competitiveness and employment).

The method used for benchmarking policies has the following characteristics: first, it is a collaborative rather than a competitive exercise (the latter is more often the case in the business world). Benchmarking policies is seen as a positive-sum game, where all participants can gain and progresses made in one country do not occur at the expense of the others. Second, an important role is played by experts for the comparative analysis of situations. Third, an accent is placed on quantitative benchmarks (through the development of benchmarking indicators), supported by qualitative analyses, assessing 'soft' framework conditions: 'benchmarking may be seen as a process aiming at establishing consensus on the basis of incomplete, implicit and intuitive models of reality' (Lundvall and Tomlinson 2001, pp. 230-231). The method differs from peer reviews, essentially, by its higher reliance on codified information through the use of indicators and by the reliance on experts rather than peers in the process. Hence, this method is located further on the 'codified' part of policy learning typology (6 in Table 8.2), compared to peer reviews, which stand more on the 'tacit' side (5 in Table 8.2).

The typical output of a benchmarking exercise is an expert report, endorsed by policy-makers, presenting a diagnosis of the situation for each Member State along with comparable indicators, an analysis of policies and generic orientations for policy improvements (generally, no precise policy recommendations are offered).

The interesting aspects of policy benchmarking as a method to enhance inter-system learning in innovation policy relate, first, to the combination of policy groups and experts groups, which should ensure depth and transparency of analysis as well as linkage with real policy-making; second, the interest paid to the variety of policy approaches, as opposed to the reductive goal of 'finding the best practice'; and third, the spillover effects

that can occur from large, multilateral benchmarking exercises in terms of their awareness-raising effects on the importance of conducting sensible analyses and evaluations of policies in countries where the evaluation culture is weak.

However, there are obvious and serious limits to benchmarking as a method for enhancing trans-national policy learning in innovation policy. First, the method requires high levels of strategic policy intelligence, which are not always readily available. Second, as for the peer reviews methods, the lack of 'holistic' evaluations of elements of the innovation policy portfolio acts as an impediment, as it is difficult to learn lessons from policies for which results are not clearly identified: the danger is to promote policy moves that receive high political support or visibility rather than those that are really effective (in their context). Third, the main result of such benchmarking exercises relates more to capacity building and the creation of a mutual learning environment rather than to short-term results in terms of practical policy changes. This might be considered as insufficient by policy-makers interested to see concrete results as direct outcomes of their efforts.

The in-depth discussions on the use and misuse of innovation surveys and innovation scoreboards apply to this method, since it relies heavily on such codified information, presented in a comparative fashion.

Critical success factors for the adoption of this method show resemblance with the factors underlined for the peer reviews method (Nauwelaers and Reid 2003):

- There is a need for a deep understanding of the state-of-play of innovation in the country to be benchmarked (based on a variety of studies, indicators, observatories, etc.);
- A strong political commitment to the exercise should be present, and a consensus reached on the subject of benchmarking (commonly agreed definition of the 'contours' of innovation policy);
- The presence of sufficient analytical capabilities and creative thinking in ministries and agencies involved in the game is required;
- The involvement of stakeholders of innovation in the exercise is needed;
- Lastly, the presence of an evaluation culture is a *sine qua non* condition of success.

**People mobility: learning-by-visiting**

Mobility of policy-makers across innovation systems is another potentially useful policy learning method, located on the 'tacit' side of the policy learning typology, although it is a much less documented one (probably

because it is often less systematic or standardized) than the popular benchmarking and peer reviews activities.

A main advantage of the method lies in the possibility of getting in-depth understanding of the context in which innovation policies operate so that the eventual transfer of practice can occur with a good understanding of differences in contexts. The downside of the method is that it usually involves knowledge exchanges which are limited to a restricted number of persons, with no guarantee that the learning can diffuse far enough in policy-making practices.

One hypothesis in relation to people mobility and the 'learning-by-visiting' model is that regional policy-makers and practitioners who implement policies seem more in favour of following that route of exchanging tacit knowledge, e.g. by visiting peers in other countries, compared to national policy-makers who seem to prefer the codified route using scoreboards, international ranking-lists and documented best practices or perhaps the use of consultants to codify what is 'in the air'.

## Concluding Perspectives on Trans-National Policy Learning for Innovation: Current Use in Europe, Potential and Limitations

The above trans-national policy learning methods are increasingly used for innovation policy-making in Europe.

Notably, within the European Innovation Trendchart project, sponsored by the European Commission, policy benchmarking workshops have taken place between 2001 and 2006 with the aim of improving learning practices in innovation policy through comparing policy approaches and policy instruments across countries. These policy benchmarking workshops can be considered as a hybrid trans-national policy learning method, situated in between the peer review and the policy benchmarking approaches. The European Innovation Scoreboard, the Trendchart database on innovation policy and the ERAWATCH database on research policies in Europe are complementing these methods by providing the necessary exhaustive and updated codified information base. The key lessons drawn from the Trendchart benchmarking workshops' experience are as follows: first, identifying good practice is a context-dependent process and cannot be generalized. In many cases there was no consensus on what the most interesting or most relevant policies are. Second, it is difficult to codify all critical elements of policy-making because there is an important tacit part in the policy intelligence. And third, the workshops succeeded in raising interest and influencing policy in the more advanced Member States, but faced more difficulties in touching those policy-makers that were less experienced and

most in need of guidance and strategic reflections (Wintjes 2003).

Within the framework of the Lisbon strategy, promoting trans-national policy learning has become a formal element in EU policy regarding the governance of research and innovation: 'Member States are invited to make full use of trans-national policy learning and cooperation' (European Commission 2005, p. 21), see action 4.3 in Table 8.3.

*Table 8.3 Actions in the new Lisbon Programme aimed at improving research and innovation governance*

| **To improve research and innovation governance in Europe:** | | |
|---|---|---|
| | *The Commission will:* | *Member States are invited to:* |
| 4.1 | Monitor and support national research and innovation policy developments through the new Lisbon partnership for growth and jobs | Where appropriate, report on national research and innovation policy developments in NRP within the new Lisbon partnership for growth and jobs |
| 4.2 | Further develop policy analysis instruments for research and innovation | Make full use of statistical and policy analysis provided by the European Commission |
| 4.3 | Support policy learning platforms and facilitate trans-national policy cooperation | Make full use of trans-national policy learning and cooperation |

*Source:* European Commission (2005)

The lessons from various trans-national policy learning methods in innovation, falling under the OMC (Open Method of Coordination) philosophy, point to promising perspectives, but also indicate the presence of three main hurdles or limitations.

First, in practice, it appears that the concept of 'best practice' is still central in those approaches, while this is at odds with the idea that innovation policies should be adapted to idiosyncratic systemic failures. Benchmarking in its traditional sense involves the use of 'benchmarks', understood as best practices. But, because of the diversity of innovation trajectories, such benchmarks are not available.

Second, policies are too seldom evaluated: hence, it is difficult to learn from comparing when information on impacts of policies is missing. This emphasizes the need, already mentioned above, for complementarities between intra-system and inter-system learning. From a more general perspective, what is also missing is information on the combined relevance

and effectiveness of the various policies to promote innovation. It is the interaction between the framework conditions and the various policy instruments as well as the interaction between the policies that can ultimately affect the quality and speed of innovation processes in a country. It is highly unlikely that a single instrument can be used to tackle an aspect of innovation performance.

Third, the method of coordination can be open, but external pressure (from other systems at national or EU level) can be a limitation to internal policy learning within national or regional innovation systems. The European Commission formally merely invites the Member States to make use of transnational policy learning (see Table 8.3), but in several ways it is not fully voluntary.

The question arises if the increased involvement of policy-makers in transnational policy learning practices should lead to policy convergence in the European Union. As innovation falls under the responsibility of the Member States, there is no formal possibility for the European Authorities to impose such a convergence, but there are soft and more informal methods of coordination. The Barcelona objective of 3 per cent (regarding R&D expenditure as a percentage of GDP) is an example. Originally, the idea was that by accepting the overall objective, convergence might come naturally from the acknowledgement that similar problem pressures would warrant similar or even joint policy responses across Member States. In the new Lisbon agreement there is, however, more awareness regarding the appropriateness of diversity of national policies, reported in the National Reform Programmes (NRP). Member States are expected to develop their own particular strategies based on specific strengths and original trajectories rather than aiming at reaching a pre-defined model.

Looking at the various mechanisms for policy convergence as proposed by Holzinger and Knill (2005) (see Table 8.4), in the face of reality of policy-making in Europe, it can be concluded that such policy learning practices are, for the moment, either running the risk of indulging in copy – paste activities, triggered by a desire for conformity, or moving towards the transfer of models found elsewhere through lesson-drawing mechanisms (Radaelli 2005). It is clear that for some innovation policy fields, and in particular environments, learning means stimulating policy divergence rather than convergence. An example of policy convergence without learning is the adoption of research themes of the European Framework Programme into the national research and innovation policies of some New Member States, not because these themes were considered to be most relevant but because of the opportunity for EU funding.

*Table 8.4 Mechanisms of policy convergence*

| Mechanism | Stimulus | Response |
|---|---|---|
| Imposition | Political demand/pressure | Submission |
| International harmonization | Legal obligation through international law | Compliance |
| Regulatory competition | Competitive pressure | Mutual adjustment |
| Trans-national communication: | | |
| Lesson drawing | Problem pressure | Transfer of model found elsewhere |
| Trans-national problem-solving | Parallel problem pressure | Adoption of commonly developed model |
| Emulation | Desire for conformity | Copying of widely used model |
| International policy promotion | Legitimacy pressure | Adoption of recommended model |
| Independent problem-solving | Parallel problem pressure | Independent similar response |

*Source:* Holzinger and Knill (2005)

From this, two conclusions can be drawn on the nature and role of policy learning in innovation.

A first general conclusion is that the various modes of policy learning (intra-organization, intra-system, and inter-system, using tacit and codified knowledge bases) are complementary: combining these various types will deliver the best results.

A second general conclusion is that policy learning should not be associated with a search for policy convergence: there is no reason to advocate such a convergence across the Union, given the diversity of innovation systems and of associated roles for policy. However, coherence between systems (regional, sectoral, national) across the EU should be promoted (in line with the European Research Area project). So, policy learning in innovation, and in particular inter-system policy learning practices, should be directed to a search for effectiveness and coherence within the daily reality of multi-level governance, but not to convergence. Aiming for convergence in economic growth and employment does not imply a convergence in innovation policy.

The last point relates to the potential impacts of trans-national policy

learning practices in the field of innovation and what is needed to increase positive contributions of these practices for innovation in innovation policy. Based on experiences in the European Union, it can be argued that the positive effects of trans-national policy learning in innovation are essentially visible in the following:

- Conceptual convergence: diffusion and wider adoption of the concept of innovation system as a background for policy;
- Increased legitimacy of innovation as a policy area. The fact that there are a lot of trans-national activities in the area of innovation can be used by policy-makers as an argument for creating room for such policies in their portfolio.

The main stimulus at stake for developing innovation policy is problem pressure: governments have been made aware that the innovation performance of their economies needs to be improved. Scoreboards and innovation surveys results (see Chapter 1 and Chapter 2 in this book) have made that pressure more visible but also more comparable with other countries (since similar tools and indicators are used across countries), hence creating the idea of parallel problem pressure as a basis for trans-national problem solving.

There are indications that trans-national policy learning practices do indeed lead to policy changes. Well conducted peer reviews, such as the one managed by the OECD for the innovation policy mix in Iceland (OECD 2005), led to visible changes in the design and implementation of innovation policy in this country. The evaluation of the Trendchart benchmarking workshops showed that participants were able to mention not only practical, but also conceptual changes in their policies, spanning the three areas of ‘paradigmatic changes’, ‘instruments changes’ and ‘organizational changes’ referred to in Table 8.1 above. Increased interest and reference in policy circles to international learning platforms such as the OECD Technology and Innovation Policy group, the Six Countries Programme or the Innovation Trendchart suggest that these are seen of value by policy-makers themselves. But, at present, it is still difficult to generalize from these indications to ascertain the additionality of trans-national policy-making practices on innovation policies in Europe.

The main limitation on the use of trans-national policy learning practices is the significant need for policy intelligence. This involves the development of strategic policy design capabilities and practices: policy-makers need to be able to create a link between innovation system diagnosis, the definition of overall strategic goals and priorities and the elaboration of instruments

responding to the stated priorities. Such capabilities stand in contrast with policy design practices that can be qualified as '*ad hoc*' or 'copy/paste' or 'follow the mood or market' or 'follow the subsidy'-type. A key question here is: what are, and what should be the main driving forces for policy changes? Are they problem-based? Evidence-based? Driven by lobby groups? Driven by evaluation of policies? Bottom-up constructed through consultative exercises? Nurtured by intelligent benchmarking? And what role do policy-makers (at instrument-, regional-, national-, and EU-level) play amongst these driving forces? The presence of full and integrated policy cycles is required here: this includes diagnosis, priority setting, instruments definition, instruments implementation, assessment of results and feedback loops between all phases of the cycle (Kuhlmann et al. 2007). The international learning component can be present at all stages of the policy cycle and at all possible policy levels. A major difficulty is therefore to come to a consensus on the appropriate level of policy learning: for some research or innovation policy issues the EU is probably the most appropriate level, e.g. concerning IPR protection, and for some innovation policy issues (especially the innovation policy addressing SMEs) the national or even sub-national level may be the most appropriate (Horst et al. 2006).

## POLICY LEARNING IN CLUSTERS

This section examines the case of cluster policies as a component of innovation policy. Cluster policies are chosen as an illustration of the above discussion on policy learning and innovation in policy, because these are relatively new policies for which there exists no universal, common model and in which the learning dimension is therefore crucial. It is also an exemplary case where intensive trans-national exchanges of experiences are taking place. A logical hypothesis could be that this represents a 'product' innovation in innovation policy-making that has been diffused and adopted widely. Two main questions are investigated in this section:

First, the content of cluster policies is examined: do these policies represent indeed an innovation in policy, and if so, could we refer to it as a product, process or organizational innovation? Our conclusions point towards cluster policies being mainly organizational innovations in policy-making; hence, we invalidate our hypothesis that these policies represent new 'products' of innovation policy-making.

The second question relates to policy learning: what is the nature of policy learning in this area and does it differ from other areas of innovation policy? In particular, is there a trans-national dimension emerging in cluster and

cluster policy learning? We argue that, despite a lot of interest in clusters (both from a research and a policy-making perspective) and despite intensive exchanges of experiences taking place, policy learning is under-developed. The policy learning approach advocated in the first part of this chapter, combining intra-system and inter-system learning practices and using codified and tacit knowledge as sources, is not (yet) visible in cluster policy. As a consequence, there is a significant gap between the remarkable diffusion of the cluster 'model' and the uncertain progress made with regard to learning in cluster policy-making. In other words, there is an important unexploited possibility for policy learning in this area.

We conclude by arguing that convergence in cluster policies is not in sight neither is it desirable in the present stage of development of this type of policies in Europe.

The discussion is based on an empirical analysis of existing clusters and cluster policy practices in Europe.

## The Real Nature of Cluster Policies: Clusters of Policies rather than Cluster Policies

### Raising interest in clusters

During the last two decades, interest for clusters has grown at an exponential rate, both in academic and policy circles.

Academic interest in clusters is linked to the development of a new paradigm for innovation, seen as an interactive process rather than a linear one: innovation is the product of complex interactions between firms and their environment through which various types of knowledge are created and exchanged. It is now recognized that innovation occurs most often in collaboration and that the model of the isolated inventor largely belongs to the past. The importance of tacit knowledge sources for innovation points to the role of physical proximity between innovation actors since, by definition, tacit knowledge is best transferred through face-to-face interactions and informal exchanges. As a result, firms interacting on a local basis compete globally but derive competitive advantages from exploitation of local resources and joint development of new knowledge through face-to-face contacts with partners. Several strands of research (economic geography, economics of innovation and technological change, evolutionary economics, management science) have come to converge to recognize the key importance of clustering and networking as crucial processes for competitiveness and growth (Martin and Nauwelaers 2004).

Policy interest in clusters has been fuelled by similar considerations, derived from the observation of changes occurring in the business sector. The

major driving forces behind this policy focus are without doubt the fascination exerted by the Silicon Valley story and a number of other flagship cases of success where the clustering effect plays a dominant role (the Italian districts being another famous case). The diffusion of Michael Porter's work on clusters within policy circles has helped to nurture this interest and to translate it in concrete initiatives with the support of consulting companies created in the wave of Porter's work (Porter 1990; 1998). Numerous cluster initiatives are under way and reports have tried to present a picture of the growing mass of experiences (Sölvell et al. 2003; European Commission 2002a and 2003; Ketels and Sölvell 2006, etc.), including several 'how to cluster' guides intending to advise policy-makers (see e.g. Rosenfeld 2001).

A recent influence that contributes the sustainment of the policy interest in clusters is the drive towards more demand-driven innovation policies (Aho et al. 2006) for which cluster policy might offer a good approach, since clusters are business-driven organizations.

**The cluster concept**

The cluster concept is however a fuzzy concept, as it has been used differently in different contexts and purposes. It is the product of an accumulation of several strands of thoughts: localization economies in economic geography (starting with the seminal work of Alfred Marshall and encompassing the numerous studies of the Italian districts), regional innovation systems and 'learning regions' in regional economics, the systemic view on innovation in economics of technological change, and firms' decentralized governance modes in business organization. The cluster concept has been a convenient vehicle to encompass new thinking in those areas, but doing so, it has become a multi-faceted and versatile concept, lacking focus and clear boundaries.

The most widely used definition of cluster, and the one that is most pervasive in policy circles, is that of Porter: 'A geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities' (Porter 1998, p. 199).

This definition points to four key elements of clusters, but there is no general agreement on the fact that these are neither necessary nor sufficient to put boundaries to the concept (Nauwelaers 2003):

1. *Geographical concentration*: this is at the heart of the idea of clusters, though a number of approaches consider the case of 'virtual clusters' of firms spread over a large territory, thus lacking geographic proximity. Arguably, the new possibilities offered by information technology solutions can in part overcome the distance, but overall,

the 'death of geography' proponents have not succeeded in explaining the persistence of physical agglomerations of firms.

2. *Specialisation*: alleged cluster benefits (see below) are only likely to occur if firms are linked by a common orientation towards closely-related technologies, markets or processes. This specialization usually spans several industries. If such commonalities are not present, then we face *ad hoc* concentrations effects, which reflect other phenomena, such as metropolitan attraction or much more general environment conditions (e.g. the presence of communications infrastructures). The word cluster is sometimes also used for purely geographic concentrations of unrelated actors.
3. *Presence of companies together with other institutions*: the cluster concept is broader than that of industry, not only because the field of activity is usually defined across traditional sector boundaries, but also because it includes organizations of another nature. Organizations such as training and research institutions, regulatory institutions, public bodies, intermediaries, financing institutions, etc. are also part of clusters. The appeal of the cluster concept is that it reflects a system of innovation view, in which framework conditions and non-firm actors play an important role on the business activities. Some clusters concepts with an exclusive focus on firms from the same industry are however also used.
4. *Connectivity*: the cluster concept incorporates a main idea of the NIS approach, in that it emphasizes the interrelations between actors as an essential component. This criterion is not always found in actual clusters, some of which consist of firms grouped under specific areas of activity, but lacking the depth of linkages and inter-relationships that are necessary for grasping many of the static and dynamic cluster benefits.

The latter two elements bring the cluster idea closer to that of the National (or Regional) Innovation System (NIS), to the point that some authors came to argue that clusters can be seen as 'reduced-scale innovation systems' (OECD 2001).

In order to focus the discussion, we suggest the following cluster definition: the cluster is a mode of organization of the productive system, characterized by a geographical concentration of a critical mass of economic actors and other organizations, specialized in a common field of activity, developing inter-relations of a market and non-market nature, and contributing to innovation and competitiveness of its members and the territory.

This definition is in line with Porter's concept above, but goes further by adding three ideas:

5. *Structural character*: cluster as a 'mode of organization' of production differs from temporary groupings of firms around specific projects. Here we refer to cluster as a long-term phenomenon. In reality, we observe both types of phenomena under the heading of clusters: structural as well as temporary linkages, the latter being closer to 'projects' than to the cluster idea;
6. *Critical mass*: clusters should include actors which, together, have a certain weight in their economy. Again here, the observation of reality shows that this is not a necessary element in a number of approaches, e.g. where emerging clusters are detected or small SMEs networks are put under this label;
7. *Importance of innovation*: clusters as a phenomenon do present an interest if they have a focus on innovation. Innovation is understood here in a wide sense, encompassing not only technological, but also organizational or commercial aspects, and with an accent on successful (in economic terms) 'new combinations'.

In the real world, different phenomena have come to be termed 'clusters'. Table 8.5 presents a simple typology of clusters based on the observation of practices in the EU.

Closest to Porter's work are the 'mega clusters', defined at national or regional levels on the basis of quantitative mapping exercises trying to evidence particular strengths of the territory. More micro-economic approaches have given the name of clusters to smaller groupings of enterprises, often SMEs, established on a voluntary basis and around common projects. These 'local networks', with a strong territorial basis, can be found in traditional sectors and have deep historical roots, as in the long-standing example of industrial districts, but exist also in high-tech activities. In the latter case of 'knowledge-based' clusters, with a more recent history, the core of the cluster is often a large technology-creating firm or public research institution and the main driving force behind the cluster is the need to ensure flows of ideas and people between the knowledge base and companies (Cowan and Wintjes 1999a). Global supply-chains of multinational corporations are also sometimes referred to as clusters, of a 'virtual' nature, since the link to a specific territory is by essence weak. According to the definition proposed above, these types of phenomena are not considered here. The three types of clusters evolve according to a diversity of paths and their success factors vary accordingly.

*Table 8.5 A simple typology of clusters*

| | **'Mega cluster'** | **'Local network'** | **'Knowledge-based'** |
|---|---|---|---|
| **Level** | Macro, Meso | Micro | Micro, Meso |
| **Driving force** | Competitiveness of the area | Competitiveness enterprises | Technological development, innovation |
| **Origin** | Mapping studies, strategic analyses | Enterprise dynamics | Knowledge flows science – industry |
| **Main com-ponents** | Sectors, value-chain, 'filière', firms and other organizations | SMEs (other firms) | Enterprises and research centres |
| **Success factors** | Critical mass, presence of complete 'filières', factor conditions, demand, adapted labour market, etc. | Geographic proximity, entrepreneurship, social capital, communication, vision, leadership, competition, competence base, etc. | Adequate regulatory and institutional framework, efficient intermediaries, match in specializations, scale economies, knowledge flows, etc. |
| **Examples in Europe*** | Danish 'resource areas' and Dutch 'mega-clusters', Finnish clusters, Scottish clusters, Austrian clusters, Basque country clusters | Italian industrial districts, French SPL, Greek clusters, Danish networks of competence, Norway SME development policy, Welsh supply chains, etc. | Flemish VIS, Luxembourg technology clusters, Dutch R&D partnerships, German Bio-regions, Finnish centres of expertise, Swedish and Austrian competence centres, Norwegian Reginn regions, etc. |

*Note:* * Many of these real-life examples possess characteristics from several types, however.

*Source:* Nauwelaers (2003)

One could argue that the latter type of cluster, based on knowledge creation and exploitation rather than on static comparative advantages, are

most in line with modern thinking on the sources of competitiveness, which is more closely linked to innovation than in the other two types.

Other typologies of clusters can of course be proposed. For example, Markusen defines four types of clusters according to the nature of member firms and other organizations (Markusen 1994): 'Marshallian clusters', composed of geographically-concentrated specialized SMEs; 'Hub-and-Spoke clusters', dominated by a large central firm; 'Satellite platforms', dominated by branch plants of foreign-owned companies; and 'State-Anchored clusters', in which the core activity is linked to a public-owned institution (university, state-owned firm, etc.). Other typologies point to the level of maturity of clusters, distinguishing between 'emerging', 'growing', 'mature' and 'declining' clusters, or to their degree of reliance on endogenous factors with types spanning a continuum between purely local clusters and FDI-led systems.

One distinction that is important for policy learning is between 'statistical' clusters (defined according to analyses of the economic fabric) and 'institutionalized' clusters (acknowledged by policy-makers). Several countries or regions have defined both types of clusters and the two sets often overlap, but rarely correspond. Many countries or regions have only defined the former or the latter types of clusters on their territory.

**Alleged and real cluster benefits**

The list of expected benefits from clusters is impressive and includes static (scale and scope economies) as well as more dynamic effects (learning effects).

The traditional view of cluster benefits is that they are the product of agglomeration economies and economies of scale: in joining forces, firms create critical masses that help them reach the necessary size to compete in enlarged markets. By concentrating on core competencies and creating a network of specialized suppliers and partners, firms can develop their unique assets, keep the flexibility of small size, but at the same time be able to respond to demands from global markets. Horizontal networks of small firms involved in the same business are often seen as a response to the problem of small size of the individual members, allowing them to gain more power and better visibility, both towards suppliers and clients. Clusters are a mean of sharing costs and risks, which have become too high for firms working in isolation.

The modern view of cluster benefits places more emphasis on knowledge flows and on the importance of tacit knowledge. Clusters are a means of opening the minds of firms' managers; they act as learning platforms, enlarge the windows of opportunities and facilitate the access to knowledge sources

and to strategic information. They also influence companies' organizational practices. Clustering is a way to access a diverse range of competences and combine them in a flexible manner, something that is outside the reach of most single firms apart from the largest corporations. This is particularly the case for R&D activities, since their cost and degree of uncertainty have grown rapidly. Our hypothesis is that this modern vision of clusters has been influenced by a shift in paradigm concerning the sources of growth and competitiveness, which place a premium on innovation. This can be inferred from a shift in emphasis in cluster approaches, from buyer – supplier relationships towards knowledge flows and industry – science relationships.

The growing interest from policy-makers towards clusters as engines of growth and development is however not matched with sufficient empirical evidence of their beneficial effects, which suggests that there has been wide diffusion of the concept, but not necessary of learning. The beneficial effects tend to be assumed rather than measured objectively. A number of announced clusters may therefore be suspected to be policy artefacts rather than 'true' clusters.

Few studies have tested cluster benefits in a robust way. Rather, the majority of empirical studies of clusters have shown a bias towards the most successful cases, with Silicon Valley as an archetype, trying to explain and document their success rather than evaluating the spread of the phenomenon or comparing those performances with those of the non-clustered firms.

One study that tried to evaluate the reality of cluster benefits is that of Bergman (2002). Using a survey of Austrian firms, the author finds that firms with strong cluster ties might encounter problems of sclerosis and experience a diminution of local competitive pressures, leading to the conclusion that clusters might be of more limited usefulness than usually thought. A review of evidence on the reality of knowledge transfers going on between firms in 'local milieus' concluded that these are generally more limited than expected (Malmberg and Power 2003). More positive indications emerge from a 2006 Innobarometer survey on clusters, in which 51 per cent of company managers surveyed in the EU-25 declared that they improved or extended their activity and that being in a cluster-like environment facilitated that development; against 25 per cent who declare that it did not (European Commission 2006). Häussler and Zademach, studying the evolution of biotechnology clusters in Germany, find no correlation between cluster performance (rather narrowly measured by growth in number of firms) and clusters characteristics such as composition (science- versus finance-oriented) or external linkages. However, their investigation shows that a cluster ability to change its composition over time to reach a more balanced ratio of science and capital over time is a good explanatory factor of cluster success (Häussler and

Zademach 2006).

Quantitative analyses of clusters tend to produce positive results. A survey analysis of 34 regional clusters in Europe found that regional clusters in general tend to show higher performance than the national average in corresponding industries (European Commission 2002a). The Innobarometer survey cited above shows that innovative companies in cluster-like environments perform better on several indicators of innovation performance and R&D intensity, compared to the general sample of innovative firms, and are markedly more involved in research outsourcing. An analysis of the statistical concentration of industries in the New Member States shows a strong positive correlation between a measure of cluster portfolio strength at regional level and GDP per capita (Ketels and Sölvell 2006). However, it should be noted that such measures fall short in capturing the real 'clustering effects' that might, or might not, be present in spatially concentrated industries. The latter study finds that regions in Europe's New Member States exhibit a lower degree of specialization than the US regions. The conclusion of the authors is that 'this is a serious concern in the light of the widespread assumption that higher levels of specialization and concentration enable higher productivity and innovation' (Ketels and Sölvell 2006, p. 56). However, such a conclusion overlooks the problem of possible 'wrong' industrial specialization in these countries.

Despite the existence of such studies, the causality between specialized geographic concentration of interlinked firms and economic success remains largely undemonstrated. This implies that there are hardly any lessons to be transferred because one cannot demonstrate what works and what does not work.

The idealistic image of clusters that is being pictured in most of the (academic, consultancy and policy) literature on clusters often hides the fact that clusters are not a panacea. Clustering can indeed be a perilous policy to follow, for the following three reasons: first, lock-in effects can be present: too much specialization in an area of activity can lead to failure in case this activity undergoes a decline process; a concentration of resources and actors around this activity will make it difficult for the territory to restructure in new activities. Second, clusters can cause a decrease in (perceived) competitive pressures. In some types of clusters, the danger might be that cooperative practices take precedence over competition processes; this can harm innovation, as the main driving force for innovation is known to be the pressure from competition. Last, clusters can nurture self-sufficiency illusions: there is a danger for participating firms to consider the cluster as a closed entity and lose sight of opportunities and trends outside of the cluster; in other words, firms may suffer from the 'weaknesses of strong ties'

(Granovetter 1973).

**Variety in cluster policies**

Such as the cluster idea encompasses a wide variety of phenomena, in reality, cluster policies take different shapes, too (Cowan and Wintjes 1999b). They can be explicit and labelled as such, or implicit in the sense that they affect clusters without being necessarily designed with this purpose. They bear the mark of different policy areas: industrial policy, regional development policy, or technology policy. Their targets differ: from mega-clusters to local networks, with a growing attention to knowledge-based agglomerations. They consist of different policy mixes, ranging from one or two instruments to a complete portfolio of policies. They address cluster creation or later stages of their life. They act on the cluster's environment or more directly on the dynamics of the cluster itself. They can be characterized by a more 'top-down' or 'bottom-up' character. Finally, they are developed at various levels: local, regional or national, sometimes in combination.

Most EU countries are engaged to a certain extent into some sort of cluster policy. Some countries, as Germany, may not be using the concept, but are implementing policies targeting 'networking', that in practice cover similar types of objectives as those with the cluster label. In the New Member States the interest in cluster policy is more recent and it is in a number of cases linked to the adoption of the concept of centres of excellence, a policy concept diffused by the European Commission to Member States. The weakness of the business sector and the lack of tradition in business cooperation explain why cluster policies are not yet very widespread in New Member States.

The 'parent policy' of cluster policy, i.e. the policy area(s) from which cluster policy emerges, varies. Overall, the influences of technology policy, industrial policy and regional policy have shaped the emergence of cluster policies throughout Europe. The mix of those influences changes across countries, with, for example, Swedish and English cluster policies being mostly built in the wake of regional development policy, while the Dutch and Finnish approaches bear a strong mark of technology policy. In the New Member States, the parent policy is more often industrial policy, as clusters are seen as a way of promoting entrepreneurship and SMEs' dynamics.

Given the diversity of institutional settings in Europe, cluster policy responsibilities are developed at different institutional levels. In Belgium, Italy, Spain and more recently the United Kingdom, these responsibilities are in the hands of the regional authorities. A strong role of the central government can be found in smaller countries such as Denmark, Finland, Greece and Luxembourg, some new Member States and also (more

surprisingly) in the Netherlands and France. Sweden is in a transitory situation with a currently strong impulse coming from the national government, which should lead in the coming years to an ownership of those policies by the regions.

The objectives of cluster policies in Europe may be classified into three main broad types:

1. Acting on clusters' environment: this category gathers the heavier public support for clusters, in terms of visibility and intensity of policy efforts. The first variant of such policy, which we call 'cluster-informed' policies, refers to the combination of a large number of policy instruments, in a co-ordinated fashion and adjusted to the specific needs of the cluster. A second variant is the provision of co-operative research – industry platforms acting as nodes of knowledge-based clusters.
2. Facilitating synergies: this category includes lighter policy intervention in clusters, reflecting the idea of some governments that policy intervention should be limited to providing impulses and playing a catalytic role rather than being a driver or putting important resources in the clusters. This facilitating role can be played either on a territorial basis ('regional/local initiatives') or more directly at the level of clusters, where the support targets the formation of the cluster identity and plans.
3. Supporting projects: cluster policies may also take the more operational form of providing support to collective projects (in this case the public support might be either heavy or light, depending on the nature of the projects). Two types of such projects can be distinguished according to the fact that they address a range of activities (marketing, export, production facilities, demonstration) or focus on technology and R&D development.

A large number of European countries are engaged in broad-scale 'cluster-informed' policies as the dominant approach: Denmark, Finland and the Netherlands at national level, Austria, Spain and the United Kingdom in some regions and Italy at a local level. Slovenia and other New Member States, given the weakness of their private sectors, also follow a similar route with a relatively strong impulse from the government. Other countries or regions have chosen other approaches: Sweden, Belgium and Luxembourg concentrate on a facilitator role of the government. Promoting SMEs' networks through projects is the dominant approach of Greece and the Czech Republic; and supporting local or regional initiative is the preferred approach

of France and Sweden. The provision of collaborative research-industry platforms and support to collaborative R&D projects are key elements of the Finnish cluster policy. Spanish and Italian regions develop strategies including most of the above types, according to their autonomous choices. Germany, as mentioned before, is not engaged in explicit cluster policies, however, the national and regional governments are active along the whole range of policy types classified under the cluster policy family.

In terms of instruments, the cluster concept calls on practically all the policy instruments traditionally found under the three 'parent policies' of industrial, technology and regional development policies. There is no established model for cluster policy. The only instrument than can be qualified as 'cluster specific' is the support of 'cluster platforms' or 'animators', usually on a limited scale and temporary basis.

The countries that are engaged in 'cluster-informed' policies use a large number of instruments, such as R&D funding, establishment of intermediaries, regulatory changes, support to training initiatives, establishment of venture capital funds, etc., in the framework of cluster development plans elaborated in partnership with the clusters actors.

Many countries (notably Sweden, Finland, the Netherlands, Denmark, Austria, Germany and more recently Estonia) also establish competence centres or similar organizations that serve the goal of reinforcing long-term partnerships around specific areas of activity or technologies, often on a territorial basis. The latter instruments do generally not fall within the realm of cluster policy explicitly; however, they are important actors in the clusters' environment or sometimes act as driving forces for their constitution.

Initiatives targeting the organization of regional innovation systems form another subset of cluster policy instruments. This is typical of the German, and more recently, British and Swedish approaches, in which the aim is to foster the definition of strategic visions in regions and the establishment of partnerships relying on specific regional strengths. The French Local Productive Systems scheme can be also placed in this category; although, their scope is more local than regional (this is also the case with industrial districts in Italy).

Close to the previous types, schemes and programmes aiming at supporting clusters' identity building are also widespread. They include the support for: animation cells, co-ordination structures, awareness-raising events, collective marketing actions, provision of strategic information, etc. Most cluster policies include such elements, but in Belgian and German regional programmes these elements are even the dominant form of support.

The Greek approach concentrates on supporting network projects for SMEs and this is also the approach the Italian government uses to act on

clusters directly. A number of German programmes also work in this direction.

Last but not least, funding collaborative R&D projects is a frequent element in the cluster policy mix, particularly so in Finland, the Netherlands, Germany, Austria and Slovenia.

The diversity in cluster policies reflects the instability of the cluster concept itself, as explained above. Cluster policies can be described as innovative combinations of instruments borrowed from technology, industrial and regional development policies. Hence, they are often rather 'clusters of policies' than 'cluster policies'.

From this analysis, we conclude that cluster policy must be seen mainly as an organizational innovation in policy. Policy learning and innovation in cluster policy is more about finding better combinations of existing policy instruments, and not about a well-defined policy model that has improved, based on lesson-drawing along subsequent phases in the policy cycle. In other words, the design of cluster policies did not evolve based on a selection and subsequent transfer of 'best' practices. Learning did not lead towards convergence in policy models. Here too, there is no best practice available and, hence, no trend towards harmonization in cluster policies. This brings us back to the discussion on policy learning modalities in the first part of this chapter.

The type of policy learning that has taken place in cluster policy relates mainly to the diffusion of the concept rather than to policy-making itself or policy instruments. It has been mostly a social learning process (Table 8.1 above) in which the policy-maker is not the only learning actor, but firms and knowledge institutions also participate in the learning process.

Intra-system learning seems the most appropriate level of cluster policy learning (second column in Table 8.2 above), at least as a first step. Clearly, there is insufficient learning at the level of individual organizations or instruments to improve a given cluster policy. What is needed is learning about the appropriate mix or cluster of instruments and learning how to address changing conditions, since dynamic clusters call for dynamic policies. In addition, codified knowledge is likely to be insufficient to capture all the intended softer 'clustering' effects, hence, the need to combine tacit and codified knowledge is also verified in this particular case of innovation policy.

The fact that cluster policies differ markedly between countries would suggest that there is hardly any trans-national policy learning possible in cluster policy. This question is examined in the next section.

## The Trans-National Dimension of Clusters and Cluster Policies

Up to this point, clusters and cluster policies have been discussed from either a local, regional or national perspective. Given the increasingly globalized character of the business environment, the question arises whether clusters are becoming trans-national in nature. Related questions are that of the need and possibility for cluster policies to become trans-national, which would imply a certain degree of convergence, or at least coherence. And this links up to the above question of the possibility of engaging in trans-national policy learning practices on the subject of cluster policies.

While in the past, cluster success stories may have occurred in closed systems (e.g. some cases of industrial districts), this is not possible in today's globalized world. This has been put forth notably by critics of Porter's approach, arguing that the elements of its diamond of competitiveness should rather be considered on an international scale rather than on a domestic one. Notably, it has been pointed out that the role of multinational companies in clusters' development and growth is underestimated by Porter (Penttinen 1994) and is, therefore, not well-suited for small open economies. Thus, even if a cluster builds part of its strength in the combination of resources organized on a territorial basis, its scope should be much larger than that.

A few empirical studies do indeed point towards this direction. Kochatzky (1998) tested the importance of the regional environment on French and German firms' innovation, based on an industrial innovation survey. The conclusion enlightens the importance of combined regional and international networking on innovation; a significant influence of regional networking on firms' probability to innovate could not be identified. Agglomeration economies do have an effect on product innovation; however, the spatial unit to be considered differs from official definitions. Thus, 'space matters in innovation, less on a specific territory, but more on a perceptive basis' (Kochatzky 1998, p. 403). In their 2003 global survey of cluster initiatives, based on 250 initiatives worldwide, Sölvell et al. identify the following success criterion for such initiatives: 'a dynamic cluster is characterised by three distinct dynamics: local dynamism, global attractiveness, and global market reach' (Sölvell et al. 2003, p. 24). Summarizing the most important elements for the growth of clusters from a large Canadian project on clusters development, Wolfe indicates that these are the '5 L': Learning, Labour (or Talent), Leadership, Legislation, and Localization. The latter element refers to the fact that informal social networks, when they function well, play an important role in nurturing and growing successful clusters, but that these clusters need to combine, on the one hand, the exploitation of local spillovers and the benefits of proximity and, on the other hand, connection to global

sources and global markets (Wolfe 2003). Micelli has shown that in the case of Italian industrial districts a critical factor for their sustainability has become their transformation into open systems (Micelli 2003).

These types of results call for more cross-border approaches to clusters and, hence, to cluster policies, too. The analysis of cluster policies at work throughout the European Union shows however that the trans-border, and *a fortiori* the European dimension of those policies, is not developed. Although promoting clusters across administrative boundaries might appear somewhat counter-natural for public authorities, whose areas of action are often confined to those boundaries, from a business perspective this is an obvious direction to follow. There is no need to see a contradiction between the geographic concentration phenomena and the need for firms active in clusters to conduct strategies on a large scale. Proximity matters for informal knowledge flows, but global sourcing is necessary to access state-of-the art knowledge; markets are global, but the labour force mostly comes from the home base, etc. Hence, clusters, conceived as local nodes in global networks appear as the new targets for cluster policy. Introducing a European or international dimension is a logical further step for cluster policies. Interest is rising for such initiatives, but the policy governance systems do not lead spontaneously to this.

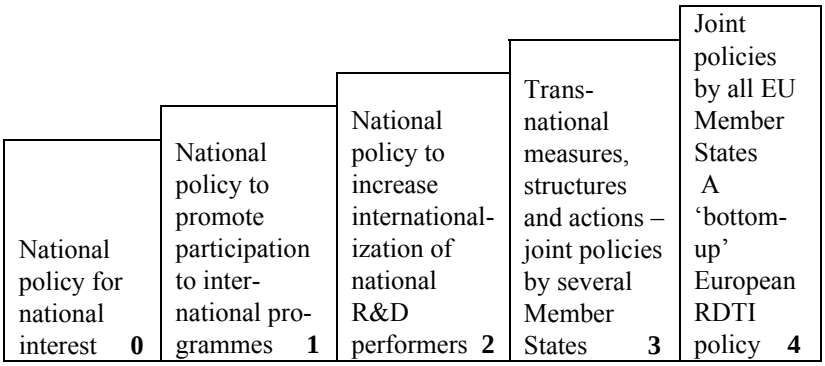
However, adopting an international approach in cluster policies does not necessarily mean convergence of policy models, neither would it imply a top-down development of a new model. We argue that it is rather, at least at this stage, about developing coherence and synergies between policies developed at various levels, and taking advantage of the diversity of policies across Europe.

There is emerging attention paid in recent times to the international dimension of clusters, either supported by European initiatives such as INNOVA, technology platforms or through joint multi-national initiatives such as the project to create trans-national cluster initiatives in the Baltic Sea region, or the celebrated Danish-Swedish Øresund cluster. The more recent approaches in New Member States, notably in Slovenia and in small Member States such as Austria, demonstrate a tendency to consider a trans-national dimension in building cluster strategies. But those are still limited islands in an ocean of initiatives confined within their narrow administrative borders.

The case of the 'Grande Région', encompassing bordering regions in Germany, Belgium, France and Luxembourg, is an illustrative example of unexploited trans-national cluster potential due to the existence of national borders. This region hosts both explicit and implicit clusters, but only the former are subject to cluster policies. Due to the presence of borders and consequent policy fragmentation, no recognition of trans-border dimension of

these clusters takes place in policies. However, according to a study performed for the Council of the Grande Région, the trans-border potential is huge, as several of the 33 clusters are active in similar specialization areas, such as automobile, ICT, aerospace or around common technologies, such as nanotechnology and surface treatment in materials. Improving the visibility of available potential might be a relatively easy and useful first step to foster cross-border linkages in a small region. The study concludes that the diversity of clusters approaches can be maintained while inter-linkages should be fostered (Kuenzel et al. 2006).

A truly European cluster policy is not in sight because the models used in the various Member States are too different, and the policy approaches diversified. Using the picture of the 'Europeanization of RDTI policies' in Figure 8.1 (Kuhlmann et al. 2007), this means that cluster polices have at best reached step 2 of the staircase, that of fostering internationalization of their national clusters. The trans-border initiatives of the Øresund type are on step 3, since they involve truly joint initiatives from several Member States.




*Source:* Kuhlmann et al. (2007)

*Figure 8.1 The staircase of Europeanization of RDTI policies*

In the longer run, it may look appealing to target step 4 to ensure a more integrated Europe in terms of cluster policy, as the next step after a progressive climb along all the previous staircase steps. However, targeting a standardized EU cluster policy is at odds with the role of innovation and cluster policies: cluster policy that addresses innovation and especially the more tacit aspects could benefit from diversified cluster policy approaches that correspond to the diversity within Europe. So, while certain elements of the cluster policy portfolio might well be approached at EU level (such as

e.g. the development of centres of excellence in research), the necessity remains to design a policy mix with components at regional and/or national level in order to cope with the diversity of contexts at the various geographical scales.

In this framework, the policy learning tools of peer reviews and benchmarking, elaborated upon above, might be useful for trans-national learning in cluster policy. A main difficulty lies in the diversity of models but, at the same time, this diversity may provide a richer pool of knowledge for policy learning.

## CONCLUSION: POLICY LEARNING IN CLUSTER AND IN INNOVATION

Faced with the profound diversity in the design, orientation and instruments of cluster policies throughout Europe as depicted in the preceding pages, one could wonder what gives coherence to this 'new' policy area.

A main difficulty lies in the translation of the Porterian cluster concept in policy tools. At the origin, the cluster concept is a tool for analysing the competitiveness of the industrial fabric rather than an approach leading directly to the design of innovation policy instruments. Apart from the cases where cluster policies are implemented in a narrow sense of providing limited and temporary support for cluster management, the cluster concept rather offers a new perspective on innovation policy, with more attention to linkages in the system. This led some authors to rightly question the mere existence of cluster policy (Raines 2002) and others to conclude that, in fact, cluster policies do not exist as a new policy area but rather as an innovative combination of existing policy instruments from traditional policy fields (Nauwelaers 2001; Cowan and Wintjes 1999a). Cluster policy becomes a mean to use these instruments in a more integrated way, taking better into account the specific environments in which firms operate. Cluster policy is an effort to improve policy interfaces, not only the policy interfaces between different policy domains touching a cluster, but also the interfaces in the multi-level governance of the systems relevant for cluster (sectoral, local, regional, national, international).

In many cases, policy initiatives exist for which the influence of the cluster concept is visible, but which are not labelled as such. In other cases, it is the reverse: policy instruments bear the cluster label, while they resemble cooperative R&D projects or go back to traditional sector support policies. We therefore argue that what is important is not so much the label put on these policy initiatives, but their effectiveness in bringing about the alleged

cluster benefits. In this sense, it is important for policies to consider clusters not as a goal in itself, but as a means to construct benefits for other goals (competitiveness, innovation, technological development, regional development). A cluster is an organizational or institutional innovation, a governance mechanism that incorporates both the soft- and hardware that is needed to generate the cluster benefits. Cluster policy is about the institutionalization of the matching strategies and structures that bring about the clustering advantage.

We also put forward that what distinguishes cluster policy from traditional policies is its mode of design and delivery: cluster policy can be seen as a more interactive way of managing innovation policy rather than as a new policy area in itself. In terms of innovation and learning, cluster policy is an organizational innovation and less a product innovation. Co-ordination, dialogue and partnership with both public and private clusters actors are at the heart of policy-making. In other words, the policy governance aspects and the associated learning are key in cluster policy.

The specificity of cluster policy lies in three aspects of policy governance:

1. The necessary high degree of co-ordination of policy-making across traditionally separated policy jurisdictions. A cluster approach calls for synergy and complementarity between the various policy fields of importance to the cluster and also between the different levels of territorial policy jurisdictions;
2. The interactive character of policy-making: as the cluster concept acknowledges the importance of business actors, knowledge institutions and governments (the 'Triple Helix') as well as the surrounding elements of the innovation system, it is vital that all these actors are involved in policy design and implementation;
3. The high degree of 'policy intelligence' needed. Conducting cluster policies can only be done on the basis of a deep understanding of the situation and evolution of the economic fabric, on feedbacks from continuous monitoring and evaluation processes, and on the capability to adjust to needs and challenges. This points towards the need to integrate learning practices into cluster policy, involving combinations of codified information through data exploitation and tacit information capturing soft linkages and spillover effects. Here trans-national policy learning practices and methods are particularly relevant.

The policy learning requirements related to cluster policies are particularly stringent. A common pitfall is to judge clusters' success on their mere existence, measured through 'counting dots'. Dangers of cluster policy

should also not be overlooked in policy learning exercises: clusters may suffer from 'the weakness of strong ties' and create rigidity due to lock-in effects. Some applications of the concept also show a drawback when a closed view is created rather than a vision of clusters as local nodes in global networks. What is needed is the following: first, cluster performance needs to be monitored and evaluated and the value-added of the clustering be demonstrated, in an evolutionary perspective. Second, the additionality of cluster policies should be established. As mentioned above, in both respects, evidence shows that these approaches are still in their infancy in Europe. Actually, and despite the huge interest and the large number of events and conferences devoted to the subject, not much is known about the real efficiency of these policies. The concept, or perhaps even only the label, of cluster policy has been successfully diffused across Europe but it does not mean that we have learned a lot about the relevance and effectiveness of the various types of policies covered under the 'cluster' label. This conclusion is also very much in line with the results of Radaelli who shows in his article *Diffusion without Convergence*, that 'ideas can travel more easily than the content of policy tools' (Radaelli 2005, p. 924), emphasizing the possible situation of a seemingly successful diffusion of a policy, but without actual convergence or real learning.

This points to an important difference between exchange of information and experiences, on the one hand, and policy learning geared towards improving effectiveness of policies, on the other hand. The various success conditions for policy learning practices, detailed in the first section of this chapter, apply fully to the cluster area.

To sum up the discussion on cluster policies, it can be argued that cluster policies, when properly designed, managed and evaluated, may pave the way towards more systemic innovation policies. But this does not save policy-makers from the necessity of developing more strategic policy intelligence to get a better understanding of the innovation system and to improve policy-making process. On the contrary: cluster policies are most complex and always context-specific. While benchmarking practices can also be applied to such policies, they are the least suitable to benefit from a 'borrow from best practice' approach. Intra-system policy learning needs to be more developed, as a prerequisite for international policy learning and for the development of joint trans-border cluster policy initiatives, respecting the diversity of European contexts.

This area of cluster policy provides an illustration of the challenge ahead with innovation policy in Europe: that of developing cross-border coherence between policies developed at various levels (local, regional, national).

Policy learning in innovation and in clusters should be directed to

improvements of the policy mix and to a search for coherence in the multi-level governance practices, but not to convergence. Aiming for convergence in economic growth and employment does not imply a convergence in innovation policy.

To conclude, the discussions in this chapter pointed towards a need for innovation in innovation policy. And as with innovation, 'the most fundamental resource in the modern economy is knowledge, and, accordingly, the most important process is learning' (Lundvall 1992, p. 1), we argue that policy learning, within and across systems, using codified and tacit knowledge resources, is key for improving innovation policy in Europe.

## NOTES

1 Chapter 2 in this book discusses the role of the innovation scoreboard in innovation policy-making.
2. See Radaelli (2003) for an overview and comparison of the OMC in different policy fields including innovation.
3. This discussion rests on Wintjes and Nauwelaers (2002).

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