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Innovations in Innovation Policy Making: The Austrian Competence Centre Programme K+

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Founded in 1963 by two prominent Austrians living in exile – the sociologist Paul F. Lazarsfeld and the economist Oskar Morgenstern – with the financial support from the Ford Foundation, the Austrian Federal Ministry of Education, and the City of Vienna, the Institute for Advanced Studies (IHS) is the first institution for postgraduate education and research in economics and the social sciences in Austria. The **Sociological Series** presents research done at the Department of Sociology and aims to share "work in progress" in a timely way before formal publication. As usual, authors bear full responsibility for the content of their contributions.

Das Institut für Höhere Studien (IHS) wurde im Jahr 1963 von zwei prominenten Exilösterreichern – dem Soziologen Paul F. Lazarsfeld und dem Ökonomen Oskar Morgenstern – mit Hilfe der Ford-Stiftung, des Österreichischen Bundesministeriums für Unterricht und der Stadt Wien gegründet und ist somit die erste nachuniversitäre Lehr- und Forschungsstätte für die Sozial- und Wirtschafts-wissenschaften in Österreich. Die **Reihe Soziologie** bietet Einblick in die Forschungsarbeit der Abteilung für Soziologie und verfolgt das Ziel, abteilungsinterne Diskussionsbeiträge einer breiteren fachinternen Öffentlichkeit zugänglich zu machen. Die inhaltliche Verantwortung für die veröffentlichten Beiträge liegt bei den Autoren und Autorinnen.

Abstract

In 1998 the first Competence Centre Programme, K+, a multi-actors and multi-measures research and technological development (RTD) policy, was introduced to Austria. Whilst the policy initiative had predecessors in the USA, Australia, Sweden and other OECD countries, it was the first of its kind for Austria. The programme was a major policy innovation for the country, not only due to its novel instruments and goals, but also because it was created in a new way, breaking with the policy style dominant in the RTD policy field before.
The paper looks into the question why this major policy innovation, which in the meantime has been recognised as a best practice model by international consultants and the OECD alike, could take place. This analysis applies the policy learning approach, considers the knowledge resources utilized for the programme creation, implementation and evaluation as well as different forms of learning which took place.

Zusammenfassung

1998 wurde das erste Kompetenzzentren-Programm (K+), ein komplexes Forschungs- und Technologieentwicklungsprogramm, in Österreich etabliert. Während in den USA, Australien, Schweden und anderen OECD-Ländern ähnliche Maßnahmen bereits bestanden, stellte das K+ Programm für Österreich eine wichtige Politikinnovation dar. Der innovative Charakter des Programmes begründet sich nicht nur durch seine Instrumente und Zielsetzungen, sondern auch durch die Art der Entstehung der Politikinitiative, die mit dem für Österreich zu diesem Zeitpunkt typischen Politikstil im Bereich der Forschungs- und Technologiepolitik brach. Diese Arbeit behandelt die Frage, wie diese wichtige Politikinnovation, die mittlerweile seitens internationaler ExpertInnen und der OECD als Best-Practice Modell anerkannt wurde, eingeführt werden konnte. Die Analyse stützt sich dabei auf den Ansatz des Politiklernens, untersucht die Wissensressourcen, die für die Programmentstehung, -implementation und -evaluation genützt wurden sowie verschiedene vorgefundene Formen des Lernens.

Keywords

Innovation policy, research and technological development, competence centre programmes, industry-academia collaboration, policy learning

Schlagwörter

Innovationspolitik, Forschung und technologische Entwicklung, Kompetenzzentren-programme, Wissenschafts-Industrie-Kooperationen, Politiklernen

Remark

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Contents

Introduction

In 1998 a new research and technological development (RTD) policy programme was created in Austria, which was radically different from previous policy measures. This initiative, the Competence Centre Programme “K+”, was not new by international standards – indeed it was strongly influenced by predecessors in other OECD (Organisation for Economic Cooperation and Development) countries, such as Canada and Sweden. Yet for Austrian RTD policy making it meant a radical innovation in the sense that the new policy instrument not only was large by Austrian standards, but also that it was more complex than any RTD, innovation or industry policy measure hitherto. Moreover the process leading to the K+ Programme was quite unusual for Austrian RTD politics, because it carried not much resemblance with the otherwise dominant style of policy making. Hitherto in Austrian RTD politics the other RTD ministries, various federal actors, external experts and the social partners were included in intricate discussion processes. These resembled the policy-style developed in other policy fields in the framework of neo-corporatist political arrangements – the Austrian social partnership of cooperation between employers’ and employees’ organisations (Karlhofer/Talos 1999, Talos/Kittel 2001).

All of these qualities – high complexity, new style of policy making, different type of policy instrument – make the K+ Programme as one of the harbingers of change foreboding the rearrangement of the Austrian RTD policy sub-system through the new university law (Universitätsgesetz 2002), the research- and technology promotion law (Forschungs- und Technologieförderungsgesetz 1982, changed 2004 and 2006), the Austrian research promotion agency establishment law (Österreichisches Forschungsförderungsgesellschaft Errichtungsgesetz 2004) and the research promotion structural reform law (Forschungsförderungsstrukturreformgesetz 2004). The role of the K+ Programme is all the more important as it was quickly perceived as a success story (OECD 2004, Edler et al 2004) and served as a model for other policy programmes on the national as well as the international level. Similarly the creation of an independent agency at arm’s length from government, the Technologie Impulse Gesellschaft (TIG), with the main task of managing the K+ Programme, created a point of reference for Austrian RTD policy making in the 2000s.

This paper tries to answer the question why a major policy innovation such as the K+ Programme was possible in an RTD policy subsystem, which before rejected changes for a prolonged period of time. It is also interested in the question how the policy developed in the following years, marked by frequent and encompassing changes in the Austrian RTD system. In an attempt to answer these questions the paper analyses the policy process leading up to the K+ Programme beginning from the first half of the 1990ies, when the idea of having competence centres in which science and industry would work together in the form of public-private-partnerships first came on the political agenda. Further analysis pertains to policy making procedures in the second half of the 1990ies, the creation of the K+

Programme in 1998, its implementation in the following years and its assessment in 2003 and 2004 as well as the first phases of the reformulation of the competence centre programmes (K+ and others) in 2005 and 2006. Such an analysis then can chart the full policy cycle of a political programme, thus circumventing concentration on the first phases of the heuristic policy cycle, from agenda setting to policy making.

The analysis will be carried out from the perspective of policy-oriented learning, or "policy learning" in short. Since the 1980s there has been an increasing proliferation of policy learning studies. Two reasons can be identified accounting for the rise in studies using the concept of policy learning.

First, the changes of policies are linked to an increased internationalisation and transnationalisation of politics, which, amongst a variety of other consequences, leads to policy-makers' heightened awareness of the actions of other politicians. This tendency is further increased by institutional solutions such as the open method of coordination of the EU or the various exercises of the policy groups of the OECD, which are supposed not only to enhance policy transfer and learning, but also to establish norms for policies and policy development.

Second, social scientists have increasingly become aware of the limitations of the traditional approaches, which not only are often based upon the traditional categories of policy analysis, interest, power and representation, but which are also in many cases contingent on the usage of (often strictly) rational models of policy-making.

Several approaches have been developed utilising the notion of policy learning, with different conceptualisations of actors, places and fora of learning, reflected in concepts such as policy diffusion (Bennett 1991, Drori et al 2003), transfer (Dolowitz and Marsh 2000, Page 2000, De Jong et al 2002), learning (Hall 1993, Sabatier 1998, Bandelow 2005, Griessler/Hadolt 2006) and lesson-drawing (Rose 1993).[1]

The approaches utilising the policy learning notion proper share a conviction that the actions of policymakers can be explained by understanding those actions in terms of feedback cycles the actors use in order to assess their previous actions. Policymakers engage in learning in order to gain a better understanding of their experiences and to arrive at better decisions in the future.

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[1] For overviews see Page 2000, Maier et al. 2003, Bandelow 2003.

Although there is a consensus on these basic ingredients of the notion of policy learning, no generally accepted standard definition of the term has been developed as of now. The definition utilised here is the following: ”policy learning” stands for the production of policy relevant knowledge, skills or attitudes, which are the result of the assessment of other policies.

Thus learning does not have to lead to a change of action, but may just entail a confirmation of what has been done or planned. Changes may therefore stay on the cognitive level - an actor may see his or her role different than before the cognitive process of learning started, he or she may justify his or her position differently or he or she may arrive differently at these justifications.

Furthermore, learning does not have to be based on some kind of strict evaluation that typically might be explicit, systematic and planned, although this may well be the case. Learning, as understood here, may be a relatively unsystematic act, happen alongside other daily practices, as for example in the case of “learning by doing”.

Actors follow a bounded rationality (Simon 1957), they have limited resources and have to live with sub optimal solutions due to their limited cognitive and material resources, this giving rise to satisficing behaviour in which they also may accept “second-best” solutions in order to preserve scarce resources such as time. Moreover, they can draw the “wrong” lessons, again because of limited resources, but also due to unclear information situations or inappropriate frameworks of interpretation.

This has several consequences for the observation and the ensuing analysis of learning. Most importantly, it is not possible to observe learning directly - a difficulty the concept shares with other social science notions and which has been discussed elsewhere (May 1992, Maier 2003). Research on policy learning therefore has to resort to explaining political action by closely analysing actions and their justification and interpretations by the actors as well as looking at the knowledge resources utilised in order to draw inferences on the existence and nature of policy learning.

With all the concentration upon the factor learning, it is important not to forget about the aforementioned more traditional categories of social science such as power, representation and interests. Without taking into account power relations between policy actors – visible and invisible (Bachrach/Baratz 1962, Digeser 1992) – it is not possible to arrive at a sensible interpretation of political actions. Policy learning takes place before and in the framework of power relations: sometimes it is even driven by these (Braun/Benninghoff 2003).

The rest of the paper is structured as follows: First, a description of agenda setting, policy finding and making, implementation and assessment of the K+ Programme is to take place. Then an analysis of the specifics and origins of knowledge utilised in the policy process will be carried out, combined with an account of different elements of policy learning found. As part of the last section the original research questions will be revisited.

The Austrian RTD System in the 1990ies

Three Policy Initiatives

In 1994 and 1995 a group of national experts from the Austrian Research Centre Seibersdorf (ARCS, Österreichisches Forschungszentrum Seibersdorf), Joanneum Research and the Economic Research Institute (Wirtschaftsforschungsinstitut, WIFO) had worked out a new technology policy concept that should replace the policy paper stemming from 1989, which was understood as too vague and not up to date. In 1996 the new concept was adopted by the Austrian government (BMWV 1996). One goal stipulated by the technology policy concept of 1996 was the strengthening of the cooperation between science and industry in Austria, which was seen as underdeveloped in Austria. Different versions of the policy paper had been circulating for almost two years. It had been debated among the social partners, representatives of the major research funds, civil servants from the science and technology related ministries and a number of other actors in the field.

At the same time the paper “Knowledge as a Factor of Production” (“Produktionsfaktor Wissen”, Stampfer 1996) had been produced by a small group of civil servants in the newly created Federal Ministry for Science, Transport and the Arts (Bundesministerium für Wissenschaft, Verkehr und Kunst, BMWVK), which had been formed out of the Federal Ministry for the Public Economy and Transport (Bundesministerium für öffentliche Wirtschaft und Verkehr, BMöWV) and the Federal Ministry for Science and Research (Bundesministerium für Wissenschaft und Forschung, BMWF). The main person advancing the paper was a young ministry official who had taken the initiative to start a process involving a number of persons from different institutions of the Austrian science and technology system (interview 3-5). The background for these discussions was that the Austrian government had targeted a technology initiative as part of which a milliard Schilling (“Die Technologiemilliarde”, approximately 70 million Euro) was to be used for financing new RTD policy measures in 1997 and 1998.

In the course of the discussion process a number of deficiencies of the Austrian RTD policies became issues of the debate. By this time both civil servants and researchers were disillusioned by the available RTD policy instruments in Austria. In the mid-1990ies RTD policies in Austria were still using mainly institutional and project funding. The main problem of institutional funding, as seen from the ministry, was that it entailed no element of political

steering. There was no way to make this kind of funding conditional. The main problem of project funding for the ministry was that it caused high administrative costs, especially compared with the quite small sums of money allocated. Under the conditions of the mid-1990ies both instruments, institutional and project funding, were plagued by a lack of funding. This was also true for the few programmes that existed at this time, which were all bundled in the Innovation and Technology Fund (Innovations- und Technologiefonds, ITF; compare Biegelbauer 2005b). Yet not only the BMWVK but also the researchers at the universities and, even more so, the researchers at the extra-university institutions were not satisfied with the situation. Whilst the ministry officials wanted an instrument to structure the Austrian RTD system, the researchers wanted to have a longer planning horizon in order to engage in larger projects. For the first time in the Austrian discussion on RTD policy, the paper "Knowledge as a Factor of Production" used the term competence centre for such a policy instrument combining treats of basic funding and project financing (Stampfer 1996, 9). Competence centres for transport technologies, cleaner production and others are mentioned by name. Although the instrument was largely under defined, already by then it was clear that competence centres should be a cooperative RTD policy instrument in which different kinds of institutions, such as universities, extra-university research institutions, polytechniques and corporations should work together. There should be diverse funding sources, including the federal government, industry and the states (Länder).

In the first months of 1996 the coalition government between the two largest parties, the social democrats and the conservatives, was renewed following the elections from 1995. In March 1996 a coalition agreement addressed the RTD policy field with a number of measures, including a raise in the level of RTD activities of the Austrian economy, the utilisation of a part of the privatisation profits for RTD initiatives, as well as an increase in the cooperation between research and industry (Stampfer 1996, 11). In general the issue of RTD policy received more attention than in previous years, which was reflected in the fact that during this time RTD policy measures were discussed in parliament, something hitherto had rarely happened before.[2]

In February 1997 the heads of the coalition government, Chancellor Klima and Vice-Chancellor Schüssel, declared Albert Hochleitner, the General Director of Siemens Austria, and Arno Schmidt, the Director of the Basic Science Research Fund (Fonds zur Förderung der wissenschaftlichen Forschung, FWF), to be their technology advisors. They had the task to write a concept for the RTD policy of the Austrian government – something they fulfilled by presenting the paper "Research and Competition: Technology Offensive for the 21st century"[3]

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[2] Nevertheless most discussions happened in the industry subcommittee of the technology committee, which served not as a hotbed of new ideas, but rather as a platform of communication in which different actors from the Austrian RTD policy subsystem met and as a forum of acclamation, in which the Minister for Science and Transport and the Minister for Economic Affairs presented what they planned to do.

[3] "Forschung und Wettbewerb: Technologieoffensive für das 21. Jahrhundert", Schmidt/Hochleitner et al 1997

four months later. The paper criticised that although RTD were important factors of production and influenced the competitiveness of modern economies, the decision making structures of the Austrian RTD system were so disparate that the creation of a comprehensive strategy for RTD seemed not to be possible.

The most important suggestions of the report were that the development of a strategy should be concentrated in a new council for research and technology, including an office for research and technology as its operative unit. All the competencies which in 1997 not only were dispersed over the Ministry for Science and Transport and the Ministry for Economic Affairs, but also in ministries with smaller interests in RTD, such as the Ministry for Agriculture, should be concentrated in this new structure. The new council should have advisory functions to the federal government and oversee the work of the office for RTD. It should consist of the Federal Minister for Science and Transport, the Minister for Economic Affairs, four representatives of the economy and four scientists. All council members should be selected by the federal government. Three new funds were proposed: a new KIR Fund for competence centres, impulse programmes, and governmental initiatives (KIR: Kompetenzzentren, Impulsprogramme, Regierungsinitiativen). The Industrial Research Promotion Fund (Fonds zur Förderung der gewerblichen Forschung, FFF) should not finance RTD of all kinds of firms but primarily of small and medium enterprises (SMEs), whereas the FWF should keep its concentration on basic research. The ITF should be dissolved. Finally tax breaks for RTD in industry should be enlarged.

One of the main funding sources for the new government initiatives should stem from the European Recovery Programme Funds (ERP), which was formed out of the remnants of the US Marshal Plan three decades earlier. The largest of the proposed instruments was the KIR Fund. It should supplement the ITF, the technology centred part of the ERP Fund and parts of the project financing of federal ministries. Amongst other things the KIR should establish, finance and evaluate the new instrument of competence centres. Institutional funding for the universities, the polytechniques, the Austrian Research Centre Seibersdorf and smaller research organisations should decrease with the new KIR Fund complementing the funding basis of the Austrian research institutions. The concept of competence centres had been concretised in the new policy paper. It was now stipulated that the financing of such a centre should be secured for five years and that it should be evaluated frequently. Other than that the paper was still quite vague when it came to competence centres, which was remarkable given that they formed the perhaps most innovative and certainly most important part of this technology initiative from 1997.

The paper “Research and Competition” was based upon a number of innovation policy studies from the mid-1990ies and on a report by the rector of the Technical University Vienna, Skalicky and a professor from the Technical University Graz, Kahlert, who had gone to Australia in 1996, taken a look at the Australian competence centre network and written a paper later on. Yet given the large similarities the most important source for the policy paper

from 1997 must have been the paper “Knowledge as a Factor of Production” from 1996. This observation is less surprising once one knows that the same person who had been the main author of the policy paper from 1996 had been a co-author, if not the front man, of the paper from 1997.

The months following the presentation of the paper by the two technology advisors of the Austrian government, Hochleitner and Schmidt, were filled with lengthy discussions and lobbying activities by several actors. Whilst the chancellor and vice-chancellor had given signals that they favoured the initiative, it was faced with resistance from several sides. First, the minister for science and transport and the minister for economic affairs had been already unhappy with the appointment of the two technology advisors to the government, as they had taken on tasks which under normal circumstances would have been theirs. In fact the ministers were confronted with a complete reorganisation plan of the Austrian RTD system they had not agreed upon. But not only the ministers were unhappy, a number of civil servants were, too. Especially the highest level of ministry officials would have lost influence on the policy field to an outsider agency in a way that was unprecedented in Austrian post-war administrative history. Another institution, which not only would have lost influence, but would have been dissolved in the way it had existed before, was the ERP Fund. This organisation, which had successfully financed infrastructure and RTD efforts of Austrian companies for more than three decades could raise concerns about a possible limitation to the usage of ERP funds due to the fact that the money was a gift by the American government which however had limited the usage of these funds.

One interview partner remarked, that the ERP Fund representatives had warned anybody who wanted to know it, that “the 6. fleet of the US Marine Forces was already on high alert” due to the new policy proposal (interview 2-11). Whilst this was meant as a joke, it indeed would have been unclear what the official position of the United States government would have been regarding the dissolution of the Fund. In addition the ERP Fund also mobilised its clientele – Austrian firms – in order to defend its existence.

On top of all of this, it was unclear where the new council and its office would be located. This was an issue for debate in so far as both Ministry for Science and Transport as well as Ministry for Economic Affairs were interested to host the new institutions. One solution that was discussed was to locate the new organisation at the Federal Chancellery (Bundeskanzleramt, BKA). This however would have meant that the chancellor would have to take over the RTD competencies, which would have included the task to represent Austria at the RTD ministers council during the first Austrian EU presidency in the second half of 1998 which was to feature final negotiations on the 5th EU framework programme on RTD (compare Pernicka et al 2003). Reportedly, this solution was not supported by the chancellor and so an inter-ministerial working group was established to further discuss these issues, a step described by an interview partner as a “funeral, first class” (interview 3-4). Indeed, for the time being, this was the end of the Schmidt-Hochleitner initiative.

Radical Innovation: The K+ Programme

In September 1997 a mid-level civil servant from the Ministry for Science and Transport commissioned the preparatory work for what later on would become the K+ Competence Centre Programme. In a few months time a group, which consisted of a few policy consultants involved in the Technology, Information and Policy Consulting Programme (Technologie, Information, Politikberatung, TIP) and the young official from the Ministry for Science and Transport who already had taken an important role in the previous policy papers "Knowledge as a Factor of Production" and "Research and Competition" came forward with a paper advancing a competence centre programme. The working group brought together by the Ministry for Science and Transport consisted, besides the already mentioned ministry official and policy consultants, also of representatives of the social partners, i.e. the Chambers of Commerce and Labour, the head of the FWF and sometimes also of one personal assistant from the science and transport ministers office. The policy paper was presented two times in front of a group of representatives of companies and the Austrian Chamber of Commerce as well as before a group of scientists and FWF representatives. By December 1997 the paper "K+ Research Competence plus Economic Competence" ("K+ Forschungskompetenz plus Wirtschaftskompetenz", BMWV 1997) could be presented.

By then the policy initiative already entailed most of the details of what later would be realised in the Competence Centre Programme K+. The rationale of the programme was that the links between public sector research and the industrial sector were underdeveloped in Austria. A competence centre programme should create incentives for companies to increase their RTD expenditures, which were found to be quite low in Austria at that time. The K+ Programme should promote the cooperation between academia and industry and "therefore foster the competitiveness of both, the Austrian economy and its science system." (BMWV 1997, II) Canada and Australia were cited as countries which have put in place similar centres and which were operating quite successfully. Yet the policy paper also states that adjustments had been made to these international examples in order to reflect the "specific characteristics of the Austrian innovation system" (BMWV 1997). The paper proposed to establish 20 competence centres, which should be based on partnerships between universities, industry and the government. In these centres researchers from universities and companies should work together, financed by public funds up to 60 % with the private sector adding the rest of the budget.

One of the innovative assets of the proposed programme was that the selection procedures for the centres were to be strictly based on a set of criteria, which was to be published well before and which would form the basis of a two-stage process. In the first stage only a small paper would have to be handed in, whilst in the second stage a full-fledged proposal would be evaluated. The selection would be based on international peer-review processes only. Furthermore foreign companies would be invited to take part in the centres so as to ensure that these were embedded in an international and competitive environment. The policy paper

extensively elaborates the criteria after which the K+-Centres should be chosen and evaluated. Of foremost importance were the extent and the quality of the industrial participation, the research programme of the centres and the organisational and management plans. Several independent firms were to participate in one centre together with research institutions. This cooperation should not only entail common RTD work, but should also include the training of young researchers and the exchange of personnel. The selection committee which should fell a decision upon reviews should consist of scientific peers, experts from the business sector and professional evaluators.

The centres were to consist of 25 to 60 persons after an initial growth-phase of three years, which should end with an evaluation of the centre. In case of positive evaluation further funding should be granted for four more years. After these seven years a second seven year term could be applied for – a clause later dropped. The paper also advanced a pilot scheme as part of which a handful of candidates should be hand-picked on the basis of fully developed proposals so that the competence centre programme would be adjusted where necessary. It stated that a catalogue of goals, which should be the basis for an evaluation of the programme and which should also contain output-oriented elements, would be written. Over the course of the first seven years of a K+-Centre's lifetime approximately 35 % of its budget would come from the federal state, about 25 % of the budget should come from the Länder (BMWV 1997).

Approximately 50 % of the policy paper dealt with the way in which the competence centres should be selected and there the largest part again was chapter 4, on the criteria for the selection of competence centres. An elaborate set of criteria had been set up: the goals of the centre, its proponents, its research competence, connections to science and companies, its RTD programme, the development of human resources, internationality, structure, finance, organisation and management. During this process of constructing the policy paper, which then was the basis for the competence centre's programme, study travels were made by a small group consisting of experts from the TIP Programme and officials from the Ministry for Science and Transport to Sweden and to Canada. A third trip was made some months later to Australia. All of these countries had competence centre programmes, which were regarded to be successful (compare StarMAP 2004). The Minister for Science and Transport, Caspar Einem, was not involved in the processes which led to the K+ Programme but was kept informed through his cabinet. When confronted with the plans for the K+ Programme, he quickly decided to use a part of the Technology Milliard, which had been realised through a law in July 1997, for a pilot phase of the K+-Programme, which began in 1998 (interviews 3-3, 3-5).

It is quite surprising that there has not been major resistance against a large policy programme such as K+ in Austria. In comparison to the history of other RTD programmes, such as the Microelectronics and Information Processing Targeted Programme (compare Biegelbauer 2005a) or the Programme on Flexible Computer Integrated Manufacturing

(FlexCIM) the establishment of the competence centre programme was not only quite smooth, but also quick. One explanation provided by an interview partner for the missing resistance is that a number of actors in the policy field were fed up with the deficiencies of the ITF, namely its lack of political steering, the cooperation problems arising between the different ministries and other actors and, last but certainly not least, the lack of funding (interview 3-5, Biegelbauer 2005b, Griessler 2003).

Another explanation might be that after the discussions on the Schmidt-Hochleitner paper in 1997, which asked for nothing less than the complete dismantling and rearrangement of the political institutions governing the Austrian RTD system and the ensuing resistance of a number of ministerial players on the level of ministers as well as on the level of civil servants, it was comparatively easier to “sell” a large scale programme, which by itself did not necessitate a rearrangement of ministerial competencies and the funding of intermediary agencies.

A third element of an explanation might address the strategy of the policy entrepreneurs from the Ministry for Science and Transport, which deviated from the policy style typical for the Austrian RTD policy in the 1980ies and 1990ies and therefore caught other actors by surprise. Indeed the ministry officials did not invite other ministries, most importantly the Ministry for Economic Affairs, to discuss the establishment of the new programme but went ahead with a small group consisting mainly of experts from intermediary agencies and the social partners. Even in this process there was a core group which drafted the policy document and which consisted only of a handful of persons, the young policy entrepreneur from the Ministry for Science and Transport and a few experts from extra-university research institutions, which were part of the TIP Programme. At the time when the policy paper was presented to other actors in the Austrian RTD system, not only was the programme already fully worked out, but the ministerial actors were not ready to change the planned programme on a large scale anymore.

A final explanation would take into account that one of the central problems of Austrian RTD policy until the mid-1990ies, the dearth for funding, did not apply to the K+ Programme. When the programme was already in its pilot phase, an opportunity arose to fund the new initiative for a longer period of time. The Austrian federal railway (Österreichische Bundesbahnen, ÖBB) had sold off their network of glass fibre cables to the German company Mannesmann, who wanted to use it for telecommunication purposes. After negotiations with officials from the Ministry of Finance and the Federal Chancellery, the Minister for Science and Transport decided to use the lion’s share of these funds for the first two calls of the K+ Programme. Therefore the new policy measure was independent from the regular federal budget and the inter-ministerial haggling over funding.

Another problem waiting to be solved was the question where the new programme should be situated. Already during 1998 the decision was taken that the programme should be not

carried out inside the Ministry for Science and Transport, but that the management of the initiative should be the task of an independent agency. An already existent organisation, the Economic Park Development Agency (Wirtschaftsparkentwicklungsgesellschaft, WEG) was transformed into the Technology Impulse Society (Technologie Impulse Gesellschaft, TIG). In the area of Austrian RTD policy it was the first independent operative agency that would initiate programmes and guidelines, engage into projects and feature a very specific mission, which was to manage cooperative research programmes. The organisation was, similar to FFF and FWF, quite independent in its decisions, despite the fact that it managed programmes financed mainly by the Ministry for Science and Transport, which two years later became the Ministry for Transport, Innovation and Technology (BMVIT, Bundesministerium für Verkehr, Innovation und Technologie). The organisation was founded in 1999, at a time when the pilot phase of the K+ Programme was already well under its way. Indeed in early 1998 the K+ Programme started with a pilot phase as part of which at the end of 1998 five centres were selected. In a second call at the beginning of 2000 seven and as part of a third call at the beginning of 2002 six additional centres were chosen.

Another Initiative: The K_{ind} and K_{net} Programmes

In 1998, shortly after the efforts to create what later should become the K+ Programme had started in the Ministry for Science and Transport, the Ministry for Economic Affairs engaged into a plan to construct its own competence centres programmes. These efforts were successful and led to the establishment of the K_{ind} industrial competence centres and K_{net} competence networks. The K_{ind} and K_{net} Programme also served the development of technology clusters and both were run by business enterprises and research institutions in the same time frames as the K+ Programme.

Besides the general aim and the idea proposed in the cooperation between science and industry a lot of other similarities can be found between the competence centre programmes stemming from the Ministry for Science and Transport and the Ministry for Economic Affairs. Examples are the development of know how to increase the chances of Austrian actors in international RTD programmes, the combination of resources in order to build critical masses for industrial RTD as well as the stimulation of private funding for RTD (Edler et al 2004). Nevertheless there are differences between these programmes, too: the K+ Programme is much more formalized and structured, whereas K_{ind} and K_{net} are less formalized; K+ is stronger knowledge driven and seeks the promotion of excellence in research, whereas K_{ind}, K_{net} are stronger industry driven and interested more in technology transfer; K+ requires the establishment of new structures, with the majority of researchers being concentrated at one physical location, whereas K_{ind}, K_{net} may consist of virtual centres and networks.

In light of the strong similarities between the two programmes, the question arises why they coexist in the comparatively small Austrian RTD system. And once again the main reason

seems to be the institutional set-up of the Austrian RTD system, one of which's characteristics is that several ministries share the competencies for RTD. Apparently there were efforts from the side of the Ministry for Economic Affairs to fuse the programme ideas of K+ and K_{ind}, which had been blocked by the Minister for Economic Affairs, Hannes Farnleitner (interview 2-6). Moreover there had been resistance from the highest management level of the Ministry for Science and Transport against the inclusion of the administrative units of the Ministry of Economic Affairs into the in 2000 newly established Ministry for Transport, Innovation and Technology, which would have brought a fusion of the two programmes (interview 2-6, 2-4).

Another set of institutions, which indeed look quite similar to the competence centres, is the Christian Doppler Research Society (CDG). The CDG was founded in 1989 to help the Austrian nationalized steel industry with state of the art RTD. In the 1990ies the CDG became independent and received finance from a number of industrial enterprises, most of which are private. The individual Christian Doppler Laboratories (CDLs) are concentrating on basic research targeted at member companies, which provide half of the budget of the laboratory. The laboratories are located at Austrian university and extra-university research institutions, working closely and continuously with firms. Together with the competence centre programmes the CDLs are the only truly joint public-private programmes in the area of RTD in Austria (compare OECD 2004). At one point the integration of the CDLs with the K+ Centres was discussed – an idea that was dropped due to the reactions of the CDG and one of its founding fathers, who in the mid-1990ies was a high-level representative of one of the science funds (interview 2-5).

Assessing the Competence of the Competence Centre Programmes

Since 2001 K_{ind} and K_{net} were administered by the FFF, and were loosely coordinated with K+ in project clearing workshops in which the TIG and the FFF took part. By spring 2003 the Ministry for Transport, Innovation and Technology and the Ministry for Economic Affairs decided to start an inter-ministerial dialogue which included the Ministry of Finance and the Ministry for Education, Research and the Arts (Bundesministerium für Bildung, Wissenschaft und Kunst, BMBWK). The goal was to decide if the different competence centre programmes should be differentiated more or stay as they were. During the first meeting the representatives of the Ministry for Economic Affairs reportedly invited the Ministry for Science and Transport officials to join the evaluation of the K_{ind} and K_{net} programmes – much to the latter's surprise – which the Ministry for Science and Transport after some discussions decided to do.

In the summer of the same year a research consortium, consisting of the German Institute for Systems Technology and Innovation Research (Fraunhofer Institut für Systemtechnik und Innovationsforschung, ISI) and the Austrian Institute for SME Research (KMU Forschung

Austria), started to evaluate the competence centre programmes. In a few months' time several dozen interviews, workshops and an extensive data analysis led to the final report "Assessment of the Competence Centre Programmes' Future (K+ and K_{ind}, K_{net}) and the Future of the Competence Centres" (Assessment 'Zukunft der Kompetenzzentrenprogramme (K+ und K_{ind}, K_{net}) und Zukunft der Kompetenzzentren'), which was published in January of 2004 and subsequently put on the Internet, where it was accessible to the general public. Not only the assessment of RTD programmes run by several ministries, but also the publication of the results of the exercise were very uncommon for Austria.

The name of the whole exercise, "assessment", was carefully worded by the ministerial actors, who wanted to circumvent the necessity to stop or radically alter their programmes in case of unwished and unforeseen evaluation results. Nevertheless the goal of the assessment exercise was to think about the future design of the programmes as well as the perspective for the already set up centres and networks. The report notes that the concepts and problem definitions of the programmes are adequate and, by and large, evaluates both programmes positively. Both programmes are criticized on a number of accounts, with the $K_{ind/net}$ programmes drawing more criticism than the K+ Programme. The researchers found that $K_{ind/net}$ produced only limited effects due to a number of reasons. One is that the programmes drew mainly large companies, which led to windfall profits for the corporations, since the firms mainly used public money to carry out RTD exercises they would have engaged into otherwise, too. They criticized that a number of cooperations already were in existence before the establishment of the K centres and networks and that therefore the additional benefit of the programmes was small. Further criticism addresses the lack of a separation between final decision maker (Ministry for Economic Affairs) and the operational agency (FFF), hindering "greater independence, transparency and acceptance" (Edler et al 2003, XIX).

Analysing the K+ Programme, the evaluation team pointed out positively the stringent programme design and the development of a new cooperative culture, the improvement of the interdisciplinary and complementary cooperation within the scientific subsystem. The evaluators also found the cooperation of different enterprises in one centre by itself and all the more in combination with research institutions in the form of strategic horizontal projects to be noteworthy. Moreover they found that the objectification of programme structure and organisation of evaluation "serves as role model" and can be "regarded as an example of 'best practice' worthy of imitation" (Edler et al 2003, XIX). The K+ Programme is criticized for the unclear future of the centres, which caused a lot of insecurity for the cooperation partners. The K+, K_{ind} and K_{net} Programmes were criticised for not taking advantage of building synergies between different centres or even between the programmes.

The assessment ended with a number of suggestions for policy. K+, the researchers state, should remain being driven by science, whereas the K_{ind} and K_{net} Programmes should

pursue the innovation targets even more clearly. All the more it should be assessed for both competence centre programmes whether there is still sufficient need and demand from industry and universities. Furthermore more coordination with the states (Länder) should take place earlier. The K_{ind} and K_{net} Programmes should in design and conduct become more objectified. The criteria for evaluation and establishment of centres and networks should become clearer and the role division between political function, project management and evaluation should become clearer, too.

Re-positioning of the Competence Centre Programmes

After several efforts to centralize intermediary agencies responsible for carrying out Austrian science and technology policy by the end of 2003 the federal government decided to form a research promotion agency (Forschungsförderungsgesellschaft, FFG). Besides the FFF, the Austrian Space Agency (ASA), the Office for International Research and Technology Cooperation (Büro für Internationale Forschungs- und Technologiekooperation, BIT) and the TIG were fused into the new FFG with September 2004 (compare Kritzinger, Prainsack, Pülzl 2006). The TIG staff took responsibility for Area II, the “Structural Programmes”, into which also the K+ Programme fell.

By 2005 around 270 corporations of different sizes were cooperating with research institutions in 18 K+ Centres. For 2005 the FFG spent 11,168 million Euro on the K+ Programme, which makes it the second largest initiative amongst the structural programmes, only being surpassed by the K_{ind} and K_{net} Programmes, which received 12,6 million Euro. The third largest structural initiative of the FFG was the FH+ Programme, funding RTD at Polytechniques (Fachhochschulen) with 5,27 million Euro. Relating the K+ Programme to the overall expenditures for RTD promotion of the FFG in 2005, which were 101,44 million Euro, it still is one of the largest programmes. In the same year also 22 K_{ind} Centres and K_{net} Networks were active in which approximately 180 corporations cooperated. At the moment plans are being discussed to integrate all competence centres programmes so that existing centres can be continued and new calls opened (FFG 2005).

After simmering for one year, beginning with the presentation of the assessment results, in 2005 discussions on the future of the competence centre programmes intensified again. Soon the decision was accepted by the major partners of the discussion process, the Ministry for Innovation and Transport and the Ministry for Economic Affairs, that the programmes should be brought together. This consensus had two effects: First, the K_{ind} and K_{net} Programmes, financed by the Ministry for Economic Affairs, beginning with mid-2005 were also administered by the FFG’s Area II (the former TIG). Second, a discussion process on the renewal of all the competence centre programmes was started. At the end of 2005 an internal paper was proposed, which was a consensus between the Ministry for Innovation and Transport, the Ministry for Economic Affairs and the FFG as well as the Council for

Research and Technological Development.[4] There have also been several rounds of discussions with the potential target communities of the new competence centre programme: universities, polytechniques, extra-university research institutes, and industry.

The new proposed competence centre programme is in fact a mixture of the K+, K_{ind} and K_{net} Programmes. It is to create synergies between the existent programmes and institutions and it wants to become a long range policy instrument in the Austrian RTD strategy. It is understood as a reaction to the increasing international competition in RTD. Different forms of instruments are planned, from relatively short termed K projects to two types of medium and longer termed centres (FFG 2006).

In comparison to the existing competence centre programmes, the proposed programme lines are more research driven than was the case with K_{ind} and K_{net}, but in comparison to the K+ Programme they are relatively less based on fixed set of criteria of excellency. Several reasons have been provided for the reopening of the debate on competence centre programmes beginning with 2005: First, the creation of the FFG was providing an impulse and the fact that the two organisations previously running the different programme lines, the FFF and TIG, since 2004 are under one organisational roof. Second, a rethinking on the side of the two ministries financing the programme, the Ministry for Transport, Innovation and Technology and the Ministry for Economic Affairs was mentioned, and third, the competence centre assessment of 2004 with its suggestion to combine the different programme lines (interview 3-11). Indeed, the proposed successor for the three competence centre programmes can be read as a reaction of policy makers to advice provided by the expert team responsible for the assessment exercise. After all the new proposed programme makes an effort to use synergy effects between the different older programme lines, whilst keeping most of the benefits of the existing programmes.

Policy Relevant Knowledge and Learning

The ITF Record

The creation of knowledge is a historically contingent social process in as that new knowledge always builds on and relates to older knowledge. This becomes especially apparent in the case of the establishment of the K+ Programme. Indeed this policy initiative hardly can be understood without taking into account the history of Austrian RTD policy, especially the experiences made by Austrian policy actors with the ITF. Whilst the ITF

[4] The Council for Research and Technological Development was established with the year 2000 as an independent body advising the government on its research and technology strategy. Although it is in name identical to the organisation suggested by the Schmidt-Hochleitner Paper in 1997, it is less powerful than its virtual predecessor as it can only suggest policy measures.

certainly was not an efficient instrument of RTD policy, and only in some cases was an effective one, it was an important policy tool around which policy learning took place during the 1990ies in Austria (Biegelbauer 2005b). The first lesson Austrian RTD policy actors learned from the ITF was that neither ministries nor intermediary agencies could expect any deeper interest in the policy field from the side of politicians. This insight led actors from both ministries and intermediary agencies to regularly take the matter into their own hands when it came to create a new policy initiative.

Second, the history of the ITF made it all too clear that the lack of funding in RTD policy was there to stay. The hopes that at one point larger sums of money would be available to develop larger and more complex RTD policy programmes had subsided for most, if not all, policy actors by the mid-1990ies. It was the first two issues, the marginal interest of politicians in the policy field and the lack of money, which had fostered the coordination problems between the different ministerial actors, which not only included the science, transport, and economics ministries in their varying constellations and set-ups, but also the Ministry of Finance and the Federal Chancellery.

Third, the two issues mentioned first also invited the creation of different allotments or fiefdoms in the policy area, which had been created and were fiercely defended by ministerial actors. It was very difficult to break through the mistrust hindering cooperative activities between high-ranking ministry officials on a larger scale. All of this led to a further increase in the short-termism of Austrian RTD policy, with ministerial actors often engaging rather into tactics and not into strategies.

The fourth characteristic of Austrian RTD politics in the 1990ies was that it featured a policy style which had come into existence due to the prevalence of the Austrian neo-corporatist social partnership. Political decisions were often made in the framework of networks which, besides central ministerial actors and a small number of experts not only included social partners, but were made in the very style in which decisions came into being in the framework of policy fields dominated by the social partnership. Such decision finding and making procedures frequently included little codification, often informal meetings of a relatively small number of decision makers under exclusion of experts, which were not directly part of the closely knit policy networks.

Put differently, it was mainly two lessons which were learned by policy actors from the ITF record: First, there was lots of learning of how (not) to run RTD programmes. Repeatedly interview partners pointed out how important the ITF was in the sense that actors could learn how to identify problems, write policy documents or evaluate programmes – including the

possibility to fail in their initiatives (interviews 2-1, 3-5, 2-8, 2-9, 2-10).[5] Secondly, policy actors learned that the ITF was not the right instrument for making successful RTD policies in a systematic and efficient way. The latter point was not only a reoccurring theme in interviews, but was driven home by one interview partner, who spoke of his impression, "that many people have almost experienced … a trauma, insofar as productive work for 10 years [in the ITF, PB] was very difficult." (interview 3-5).

(Trans)National Expert Communities and (International) Organisations

Several older policy papers were formative for the competence centre programmes. The most important of these, the Technology Policy Concept (BMWVK 1996), as well as "Knowledge as a Factor of Production" (Stampfer 1996) and "Research and Competition" (Schmidt/Hochleitner et al. 1997) have been mentioned afore. All of these papers are based upon up-to-date theoretical thinking from economics and social sciences. Most importantly, these papers are influenced by the vast literature on systems of innovation, which was quite influential in RTD policy making beginning with the early 1990ies (Freeman 1987, Lundvall 1992, Nelson 1993, Lundvall/Borras 1999, Biegelbauer/Borras 2003, for Austria: Mayer 2003). The international literature on innovation systems has found its way into the afore mentioned documents either directly, as in the case of the Technology Policy Concept, or through the intermediation of policy experts, in many cases through the TIP Programme participants.

Indeed the policy experts, who had been nurtured through the TIP Programme and other measures and were located in many cases either at the WIFO, the ARCS or Joanneum Research, as well as to a lesser extent at the Academy of Science and the Institute for Advanced Studies, over the 1990ies had been in an increasingly closer contact with the policy makers in the federal bureaucracy. They had taken on new functions over time: earlier RTD policy programmes, such as the Microelectronics and Information Processing Targeted Programme, which was active from 1985 to 1990, or the Flexible Computer Integrated Manufacturing Programme, from 1993 to 1996, had been conceived by civil servants from the federal ministries. But for the K+ Programme the role of the experts was not only to provide knowledge, but to actively participate in constructing the main policy documents upon which the K+ Programme rested. Whilst these changes have to be seen in the framework of the restructuring of federal bureaucracies taking place in most OECD countries during the last two decades (Peters 1996, Aberbach 2003), in the case of Austrian RTD

[5] Interestingly interview partners with differing backgrounds were of the same opinion, including policy experts from extra-university research institutes, from intermediary funding agencies and from federal ministries. This might also be taken as one indication for the co-evolution of an Austrian RTD policy community from the late 1980ies to the late 1990ies, which began to share a common history and – to some degree – also commonly held views of how the world works.

policy it also shows the significance of the rise of a part of the expert community in a policy field which did not exist before the mid-1980ies.

The extensive co-production of RTD programmes by civil servants and policy experts from research institutions was made possible not only through the TIP Programme and the more far reaching changes in the public understanding of structures and functions of public bureaucracies all over the world, but also by the internationalisation of the RTD policy field. Networks of policy experts were formed around international organisations, most importantly the OECD and the European Union, from the 1970ies onward (Armingeon 2004, Marcussen 2004). The impact of the OECD networks in Austria often was rather indirect in the sense that in RTD policy Austria often did not take part in policy initiatives of the OECD (interviews 1-5, 2-14). Yet the federal government sent national policy experts frequently to Paris, either as permanent residents, or to take part in the frequent workshops and meetings of the various working groups. Therefore, despite the missing grande strategy of Austria towards the OECD and the frequent reluctance to follow OECD suggestions (interviews 1-2, 2-14), there was a slow and indirect but steady effect of the Austrian OECD membership upon the broader knowledge base of Austrian expertise in the RTD policy field (interview 2-1).

In other policy areas the effect of the OECD has been described as much more direct. An example has been provided by a former official from the Ministry of Finance, who said that the regular contacts with OECD working groups caused the Austrian representatives to upgrade their knowledge to – higher – international standards in the 1970ies and 1980ies (interview 2-8).

The Austrian EU accession in 1995 had a more immediate impact. It affected not only civil servants with international leanings inside ministries and experts from research institutions, as had been the case with the OECD, but also all the other ministry officials and policy experts due to the effects of the acqui communautaire on Austrian law and the binding nature of many of the agreements being struck in the very working groups and council meetings Austrian representatives were taking part in. Even although the EU activities were not taken serious by all ministerial staff at the beginning of the Austrian membership (interviews 3-5, 1-1), the effects of a large number of civil servants going to Brussels and coming back with new impressions and papers based upon other working styles and administrative traditions were being felt immediately. Knowledge on the way in which RTD policy programmes were made in other countries, the ways in which they were implemented and evaluated, began to seep into the workings of the ministerial machineries starting with the international departments responsible for working with the European Union from early on. As one former ministry official observes, “policy developments in the national arena are often pushed forward via real or supposed ‘Brussels’ or ‘European’ standards, no bench remains unmarked. Ministry mandarins go to European meetings with their agendas in mind and come home with a kind of conviction that something must be changed in their country due to the ‘standards’ mentioned” (Stampfer 2003).

The effects of international organisations and transnational networks emanating from these are therefore twofold: International organisations reach into national RTD systems, such as the Austrian one, via the knowledge they offer and which is taken and proceeded through policy actors from national ministries, intermediary agencies and policy experts from research institutes and consultancies. They also have a more direct effect on actors in providing platforms in which experts exchange experiences and opinions, sometimes under the tutelage of the international organisation, sometimes based on their own initiative.

In the case of the establishment of the K+ Programme these international experiences were supplemented by a more direct knowledge transfer from three countries with ample knowledge on the policy instrument envisaged by the Austrian policy makers. Already in 1996, well before the K+ Programme was on its way, two professors from the technical universities of Vienna and Graz, Skalitzky and Kahlert, had been to Australia, where they had visited Australian Cooperative Research Centres, existing since 1990. Upon returning to Austria, the two professors, who were in different functions well entrenched in the Austrian RTD policy community, wrote a report, which they sent out freely, praising the Australian Competence Centre Programme.

Two years later, already during the writing of the policy document for the K+ Programme, a group of policy experts and ministry officials travelled to Sweden and Canada in order to analyse the Swedish Competence Centres Programme, which had been set up in 1995, and the Canadian Networks of Centres of Excellence Programme, which was running since 1989. A year later, already during the pilot phase of the K+ Programme, a last and most extensive study visit was made to Australia. There was a consensus amongst interview partners that these trips had been worthwhile, as they had led to a marked increase in knowledge on what was perceived to be international best practice in the area of competence centres (interviews 3-2, 3-5). The study visits also led to the building of an international network of experts, which was accessed by the TIG staff.

Indeed one instance in which the TIG personnel made use of these international contacts was a series of international projects which ran from 2002 onwards in the framework of the TIG and later FFG. From 2002 until 2004 three EU-financed projects, the MAP-Thematic Network, the starMAP and discoMAP were active in which eleven international partners took part. The aim of the three projects was to exchange insights on multi actor multi measures programmes, so called MAPs, such as competence centres (roadMAP 2004, starMAP 2004).

One of the outcomes of the MAP projects was an evaluation of the international influences the analysed competence centre projects were subject to. In the final document of the MAP Project, the authors point out several levels of international influence: good and best practice approaches as fostered by the OECD and the EU, international research alliances and networks, the involvement of foreign peers in selection procedures, ex ante, monitoring and ex post evaluations and the opening up of national programmes. They also identified

different families and pedigrees of MAPs. The Engineering Research Centres Programme (ERC) of the US National Science Foundation (NSF) in the 1980ies was identified as the "mother" of the competence centre programmes, directly influencing the Australian Cooperative Research Centre Programme and the Swedish Competence Centres Programme. The Austrian K+ Programme studied the Australian, the Swedish and Canadian examples and the Hungarian Competence Centre Programme was based upon the US-model, but took into account the Swedish and Australian and Austrian experiences when it was established in 2000. The Estonian Competence Centres Programme was established in 2003 after Estonian policy experts had studied the Hungarian, Swedish and Austrian programmes.

Policy and Political Learning

Knowledge flows can be observed for the creation of the K+ Programme on the international as well as on the national level. An example from the early history of the K+ Programme on the national level are the meetings of the group consisting of ministry officials and policy experts setting up the original K+ policy papers with representatives from science and the economy. As has been pointed out, these meetings took place at a time when the central part of the policy paper and the programme had already been in existence. The meetings had a twofold purpose: First, they were to get a feedback on the proposed programme by the two core communities, science and industry. Second, the meetings should legitimise the process leading to the new and relatively large as well as quite innovative policy programme. Given that according to an interview partner (interview 3-5) the original policy paper was not crucially changed due to this discussion processes, it seems fair to say that the legitimation was at least as important as was the feed-back function.

Indeed two reasons come to mind why such a legitimation might have been of increased importance for the political process leading up to the K+ Programme. First, the proposed policy programme was radically different from other policy measures implemented in Austria by the end of the 1990ies. It was not the policy goal of bringing together science and industry to cooperate more closely, but it was the way in which this cooperation was to be achieved that was so new. The competence centres were not only larger than most of the hitherto existing Austrian RTD centres, not only were they to be terminated after seven years, they also were to be closely monitored through their lifetime. And perhaps most important of all, the way in which they should be selected formed the very centre of the policy paper advancing the programme, making the selection and evaluation procedures the centres had to run through very strictly based upon preconceived criteria.

Second, the way in which the policy idea came into existence and the following policy document was drafted was quite unusual for Austrian RTD policy making. As has been pointed out afore, neither were the social partners granted a privileged position in the

discussion process, nor were other ministries asked for their opinion – a procedure which was common practice and which under the specific circumstances of the Austrian RTD policy structures – lack of funding, unclear responsibilities, little interest from politicians – was quite cumbersome and partially responsible for stifling the creation of innovative policy instruments during much of the 1990ies. In light of previous experiences with policy initiatives, the way in which the K+ Programme was conceived could be seen as a form of political learning. Different from the term policy learning, political learning relates to strategies of "selling" a political measure (May 1992).

Learning at the Operational Level

Another incidence of learning at an early stage of the K+ Programme was the pilot phase of the K+ Programme, which started during 1998, when in a first evaluation round five centres were chosen which were to enable the newly founded agency TIG to gather experiences with the new policy programme. Several interview partners agreed that this was the case: Whilst administrative routines were carried out in a very strict kind of fashion during the first months and years of the programme, there soon was a smoothing of administrative routines, which became established social practices over the course of the following years (interview 3-10). Paralleling this development a flexibilisation in the handling of administrative procedures and evaluation criteria was seen as a positive development by TIG and non-TIG interview partners alike (interviews 3-4, 3-10, 3-11). These changes in the behaviour of the programme administrators can be subsumed under "learning by doing". It is interesting to notice that the agencification of RTD policy functions, of which the TIG was one of the first examples in Austria, was seen as an asset in this context (interview 3-2, 3-4). Reasons provided for this impression were the smaller administrative apparatus of the organisation and the less strict regulation of the TIG staff in comparison to the situation the personnel in federal ministries had to cope with. Both factors allowed for a more flexible reaction to the frequent transformations the K+ Centres were going through during the course of their existence.

The TIG itself also made use of several instruments to gain new knowledge and insights into the workings of their programmes. One tool which worked mainly on an international level was already mentioned: The MAP Projects, as part of which the experiences with complex multi actor multi measures programmes (MAPs) were exchanged with a number of mainly European governmental agencies in the RTD sector. Whilst an example for a direct impact of one of the MAP Projects could not be found, several interview partners pointed out how important the knowledge of the working standards and administrative routines of similar organisations in other countries were for their work (interviews 3-4, 3-11). This seemed to be also an important point for the creation of the successor programme of K+, K_{ind} and K_{net}, which qualifies the MAP Projects as having an impact on the policy as well as on the operational level.

Another instrument was the Austrian chapter of the Society of Organisational Learning (SOL). In order to learn more about the specific framework conditions under which the K+ Centres have to work, a project was started in 2001 in which four of the competence centres, the TIG and the Society of Organisational Learning (SOL) participated. In the project "Learning Processes for Innovative Infrastructures" the goal was to analyse organisational learning and obstacles to learning in the four competence centres. Recommendations and best practice examples for effective learning were to be provided. The starting hypothesis was that the K+ Centres are challenged by the fragmented and heterogeneous conditions under which they have to work. Frequently problems are that a number of corporate cultures are represented in one centre and that the members of a certain project may be scattered over a number of locations.

Accordingly, three issues were chosen to be at the centre of the project, person-based knowledge and fluctuation, developing competence in the centres and fragmented corporate culture. Each of the four centres was visited by a team consisting of staff members from TIG, consultants from SOL Austria and the other centre managers. In a series of workshops these teams were confronted with staff delegated by each centre discussing the three topics laid out above.

Four main messages were summarized: First, the fluctuation of centre staff is a challenge and a chance at the same time. It means often the loss of important competence carriers, but it also can translate into the inflow of new ideas, when new personnel joins a centre. Second, it is important to build knowledge beyond individual RTD projects through internal workshops, matrix organisation, informal gatherings and other measures building knowledge across the different projects and areas existing in a centre. Third, the heterogeneous staff working on an often temporary basis forms sometimes a problem for the formation of a centres identity. A challenge, which can be countered through a clear mission and strong leadership. Fourth, in some cases large "parent" companies can have a decisive and sometimes stifling influence on a centre's management. Centres therefore need to emancipate from their founders and owners, necessitating a good deal of entrepreneurship on the side of the management team (roadMAP 2004, 124; Haubold et al 2001). As the project on organisational learning was deemed to be a full success, a follow-up project with seven more K+ Centres was carried out in 2003.

The Assessment as an Instrument Supporting Policy Learning

The assessment of the competence centre programmes, which was carried out in 2003 and 2004 by policy experts from the German Fraunhofer Gesellschaft and the Austrian KMU Research was another instrument facilitating policy learning. It is important to notice that learning here mainly took place on a policy level and not on an operational level, different from the activities of the TIG staff in SOL Austria and the MAP projects.

The assessment exercises fostered learning in different forms. First, already the fact that an evaluation-like analysis of the competence centre programmes was made forced policy actors from ministries as well as intermediary agencies to look back and reflect upon their role in the policy programmes and their work in the first years of these measures. These reflective activities often took on the form of a quasi-binding character, since they were done in a semi-public way, interviews to be transcribed, in statements to be taken up into the assessment reports or in reactions to the expert's reports in workshops, where other policy actors would take notice of them.

Second, the interactions of policy makers took on a different character since they were structured by a planned common activity, i.e. the assessment exercise, entailing the aforementioned workshops and an itinerary with milestones. Policy makers from different ministries who were barely communicating with each other due to antagonistic relationships, now had to interact in one way or another.

Third, the mixture of outsiders to the Austrian RTD system, the experts from the German Fraunhofer Gesellschaft, and insiders, from the Austrian KMU Research, helped to provide the team carrying out this study a more neutral position, acceptable to all actors taking part in the process. Social Learning took place when high-ranking ministry officials began to communicate with each other. Instrumental learning happened when the competence centre programmes were discussed with their strengths and weaknesses in a way that did not exclude or let alone stigmatise some of the discussants. Both forms of learning were interdependent with social learning being a logical predecessor of instrumental learning in this case. The already existing antagonisation of the two involved ministries' leading civil servants had reached into some of the competence centres, where actors held the belief that one or the other ministry and one or the other programme were to be preferred over the other. Through the process of the assessment this polarization was already weakened. The workshop in which the assessment report was discussed finally broke the ice. This establishment of a working-relationship between the two leading ministry officials started a discussion process, which, if over a prolonged period of time, led to a concentration of management functions in the same FFG unit and to plans to reform the competence centre programmes and create a single programme with different programme lines.

Policy Entrepreneurs

Despite the long-standing interest of social science in political leadership, there has been relatively little interest in integrating works on leadership (Lasswell 1950, Pelinka 1997) into the literature interested in policy learning.[6]

As the case study on the introduction of the K+ Programme in Austria shows, policy entrepreneurs can play an important role in the establishment of policy measures. Here it was a young civil servant, who had gained insight knowledge on the Ministry of Science and Research and the Ministry for the Public Economy and Transport, the two predecessors of the Ministry of Science, Transport and the Arts, which initiated the K+ Programme. Despite being quite fresh in the respective ministries and therefore being in the lower ranks of the ministry, he had partaken in the creation of the two afore mentioned policy papers "Knowledge as a Factor of Production" and "Research and Competition". After the failing of the latter initiative, the civil servant had taken the idea of competence centres to one of his superiors, a mid-level administrator, who had become interested in the idea of competence centres. From then on the young ministry official had acted as a policy entrepreneur par excellence, shepherding the idea of a competence centre programme through policy finding and policy making processes until the programme was established in 1998. Yet his engagement did not stop there: he became part of the TIG staff and therefore was further concerned with the K+ Programme until he left the agency some years later. Keeping a further interest in the policy instrument, he was involved in 2003 in the selection of the policy experts, which were to assess the competence centre programmes K+, K_{ind} and K_{net}.

All of these activities are typical for policy entrepreneurs. Richard Rose points out that "policy entrepreneurs combine commitment to programme goals with long service in government … are usually very well informed about the substance and the politics of programmes. Their concern with a special subject … leads them to build up a nation-wide or international network of contacts that are a source of ideas for new programmes and of evidence to support the lessons that they choose to draw." (Rose 1993, 56; Mayer/Lassnigg 2006). Whilst the young policy entrepreneur important for the establishment of the K+ Programme at the time of the K+ Programme creation could not look back at long service in government, all the other elements of Rose's definition are accurate. Especially the creation of a large network of contacts serving as a source of ideas for the new K+ Programme can be found here. Yet the network did not only have the role of being a knowledge repository for the policy entrepreneur, but it was also used in order to rally support for the new policy measure. Roberts emphasizes that policy entrepreneurs not only have a role in the facilitation of policy

[6] Exceptions are Richard Rose (1993) and Nancy Roberts (1998). Leadership barely plays a role for the literature interested in policy learning, which is based on neo-institutionalism. This otherwise fruitful school of thought (Hall/Taylor 1996, Peters 1999) focuses on the effects of institutions and norms, values and rules they are based upon, often at the cost of ignoring the role of individuals.

learning, but that their role also is inherently political. They are “mindful of the political realities, they are concerned with framing their ideas in the best possible light in order to attract and expand their base of support, their strategies and tactics are designed to overcome resistance … and sell power-holders on the merits of their ideas. Building a coalition and keeping it focused on their policy objective is a priority, not just through policy formulation, but also through implementation and evaluation.” (Roberts 1998, 115)

Regarding the political strategies of framing the policy problem, which would necessitate a competence centre programme and building a coalition favouring such a programme the working group drafting the policy paper upon which the K+ Programme should rest, included not only a number of key-actors such as the social partners and intermediary funding agencies. Also a member of the science minister’s cabinet was present from time to time, who not only served as a liaison to the minister, but later also became the head of TIG.

The policy entrepreneur in the introduction of the K+ Programme had a crucial domain knowledge about the policy field and the administrative units involved in the creation and carrying out of the programme. Yet it might have been helpful that he was not a long-standing insider of one of the ministries, having changed between different ministries inside the policy subsystem, thus being able to combine insight and outside views.[7]

A number of factors then seem to have been of specific importance for the success of the policy entrepreneur in the case of the introduction of the K+ Programme in Austria. Besides the role of being an insider/outsider with a lot of domain knowledge, who was interested in a systemic change necessitating radical innovations inside the Austrian RTD policy subsystem, the ministry official was ready to invest a lot of energy into the realization of the idea of a competence centre programme. This strong interest in the implementation of a certain political measure seems to have not depended on the (relatively low) hierarchical position of the entrepreneur in the Ministry of Science and Transport, but very much on the existence of a network of contacts the civil servant had to his personal disposal. It was also combined with the availability of knowledge in the form of a number of policy experts on which the policy entrepreneur could rely. In addition he had the social skills necessary to build a network, which could play the double role of offering knowledge and political clout.

Yet it is also important not to paint an overly rational picture of the policy process analysed here as there was a clear element of chance involved, too. At least as important as the above factors was the availability of a policy window, which was opened by an increasing dissatisfaction with the available policy instruments in the RTD policy sub field. And even more so, the existence of a minister, who upon reflection of the fact that most of his energy

[7] This observation would be in line with the remark of Roberts that “radical policy change is not initiated from system insiders. … It is too easy for radical ideas to die on the inside” (Roberts 1998, 123).

was consumed by transport policies, was ready to give much leeway to civil servants without shying away from necessary decisions, when they were asked for by his cabinet.

Conclusions

The main focus of the paper was to answer the question why a radical policy innovation such as the K+ Programme was possible in the Austrian RTD policy subsystem, which in the decade before had rejected changes for a prolonged period of time. It could be established that the K+ Programme indeed was innovative for Austria. The policy initiative was quite large for Austrian terms and it was more based on formal criteria than any top-down RTD policy measure in existence before, with all the targets of the policy set ex ante.

Moreover the K+ Programme was highly internationalised: It was set up under consideration of similar programmes in other OECD countries, namely Australia, Canada and Sweden. From begin on the main instrument for the selection of competence centres was the utilization of international peer reviewers. Also the MAP Projects originated from TIG, the agency managing the K+ Programme. As has been laid out, the MAP Projects were an instrument to compare the K+ Programme with similar international policy measures.

In addition the K+ Programme was quite reflexive. On an international level the MAP Projects have been used as an instrument for reflection and discussion. On a national level the involvement into the Austrian chapter of SOL played a similar role. An evaluation of the programme was performed in 2001 (Steyer 2006) followed by an international assessment in 2004 (Edler et al. 2004).

Several reasons have been provided why a major policy innovation such as the K+ Programme was possible in the framework of an RTD policy subsystem, which before had been rejecting changes for a decade. The most important observation is that this policy innovation can not be explained by looking at the Austrian political system. Neither have there been major changes in the Austrian government preceding the introduction of the K+ Programme – a new coalition government between the Conservative Party and the Freedom Party took power more than two years later, in early 2000. Nor can political activism be found on the highest level of politics – the major policy reform proposed as part of the paper “Research and Competition” (Schmidt/Hochleitner et al. 1997) had been rejected the year before. An important reason for the fast establishment of the K+ Programme was that a sizeable part of the Austrian RTD system was unsatisfied with the at that time largest Austrian RTD policy instrument, the ITF. The lack of political steering, the cooperation

problems between the different ministries and other actors and the lack of funding made the ITF an inefficient policy instrument in the eyes of a number of policy actors.

It was precisely the lack of funding, a key component of Austrian RTD policy over most of the 1980ies and 1990ies, which the new K+ Programme in 1998 had not to face. The funds from the privatisation of the Austrian Federal Railways (ÖBB) glass-fibre network saved the policy actors proposing the programme from having to combine funds from different sources in order to be able to activate the programme. For many other Austrian RTD policy initiatives programme administrators and civil servants had to collect funding on a yearly basis in order to keep the programmes running, if often at a minimal level.

The above mentioned reasons made it easier for the young policy entrepreneur from the Ministry for Science and Transport to push the programme. The effort to build a coalition for the new programme was also eased by the fact that a single programme caused much less upheaval than a major policy reform such as the one which had caused so much discussion in 1997: it could be “sold” much easier to the RTD policy community. The availability of funds and the fact that major actors did not see their interests endangered created a window of opportunity for the establishment of a policy innovation such as the K+ Programme, which could be used by a determined policy entrepreneur who was willing to invest time and energy into the creation of the K+ Programme.

Another task of the paper was the analysis of the K+ Programme through the perspective of a policy learning approach. It was found that learning indeed played an important role in the establishment, implementation and evaluation of this competence centre programme. Already in the early phases of problem definition the role of international and national experts has been found to be important, with the policy documents leading to the K+ Programme referring to the national innovation systems approach. As part of the decision finding and making processes experiences from other countries were used to set up the new policy initiative in Austria. Furthermore a co-evolution of the still young national RTD policy field and an increasingly internationalising Austrian community of experts has been proposed. The internationalisation of external policy experts as well as civil servants has been fuelled by globalisation and Europeanisation processes, with the Austrian EU accession in 1995 having a clear threshold effect. With the mid-1990ies the internationalisation of the whole policy field accelerated markedly, amongst other developments changing the predominant policy style in RTD policy making into a more formalized and internationalised one.

Several instruments have been found to facilitate learning processes. On the operational level of programme management these were the MAP Projects and the involvement of TIG into the Austrian chapter of SOL. Predominantly on a policy level learning processes were

triggered by the assessment exercises in 2003 and 2004. It was especially the latter activities, which together with a number of other factors including the structural changes taking place in the Austrian RTD policy subsystem, led to the reassessment of all three Austrian competence centre programmes and to the idea of establishing a new programme, which should replace the older ones and focus them in one policy instrument.

Abbreviations

ARCS	Austrian Research Centres Seibersdorf
ATS	Österreichischer Schilling
BKA	Bundeskanzleramt
BMBWK	Österreichisches Bundesministerium für Bildung, Wissenschaft und Kunst
BMöWV	Österreichisches Bundesministerium für öffentliche Wirtschaft und Verkehr
BMVIT	Österreichisches Bundesministerium für Verkehr, Innovation und Technologie
BMWF	Österreichisches Bundesministerium für Wissenschaft und Forschung
BMWV(K)	Österreichisches Bundesministerium für Wissenschaft, Verkehr (und Kunst)
CDG	Christian Doppler Gesellschaft
CDL	Christian Doppler Labor
ERP	European Recovery Fond
EU	European Union
FFF	Forschungsförderungsfonds
FFG	Forschungsförderungsgesellschaft
FWF	Fonds zur Förderung der Wissenschaftlichen Forschung
GDP	Gross Domestic Product
ITF	Innovations- und Technologiefonds
KIR	Kompetenzzentren, Impulsprogramme, Regierungsinitiativen
MAP	Multi-Actors Multi-Measures Programme
OECD	Organisation for Economic Cooperation and Development
RTD	Research and Technological Development
SME	Small and Medium Sized Enterprises
SOL	Society for Organizational Learning
TIG	Technologie Impulse Gesellschaft
TIP	Technologie Innovation Politik
WIFO	Wirtschaftsforschungsinstitut

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