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# The Austrian Innovation and Technology Fund: Between Power Play and Policy Learning

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Reihe Soziologie  
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Technology Fund**  
Between Power Play and Policy  
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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 Wirtschaftswissenschaften 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**

This paper analyses the slow institutionalisation of the Austrian technology policy. It concentrates on the years between 1987 and 2002, between the creation and the dissolution of the Innovation and Technology Fund (ITF). For the analysis of the ITF's history not only classical social science categories such as interests and power are considered, but also a policy learning perspective is employed. Questions raised extend to the existence and nature of experiential learning in the creation and the reforms of the ITF, the usage of policy instruments to gather experience and knowledge, changes in the use of knowledge of policy actors and the role of national and international role models.

## **Zusammenfassung**

In diesem Forschungspapier wird die langsame Institutionalisierung der österreichischen Technologiepolitik analysiert. Der Fokus liegt auf der Zeit der Existenz des Innovations- und Technologiefonds (ITF) in den Jahren 1987 bis 2002. Zur Analyse der Geschichte des ITF werden nicht nur klassische sozialwissenschaftliche Kategorien wie „Interesse“ und „Macht“ herangezogen, sondern auch Lernen in der Politik berücksichtigt. Die Bandbreite der gestellten Fragen reicht von der Präsenz und Art von Erfahrungslernen bei der Schaffung des ITF und seinen Reformen, über die Verwendung von Politikinstrumenten zur systematischen Beschaffung von Erfahrung und Wissen und die Veränderungen in der Verwendung von Wissen durch politische Akteure bis zur Rolle nationaler und internationaler Vorbilder.

## **Keywords**

Policy Learning, Knowledge, Austrian Research and Technology Policy, Innovation and Technology Fund, Internationalisation

## **Schlagwörter**

Politiklernen, Wissen, österreichische Forschungs- und Technologiepolitik, Innovations- und Technologiefonds, Internationalisierung

**Remark:**

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## Introduction

The end of the unprecedented growth period following World War II, which came with the oil crises of the 1970ies and 1980ies, led to a search for new policies addressing the economic problems. One policy solution many OECD-countries adhered to already in the 1970ies, was a construction of a new set of research and technology policies creating new knowledge, new processes and new products. These innovations then were to find their ways into the economy and make the national economies more competitive.

In Austria these developments led to the creation of the first Austrian technology policy programme, the Microelectronics and Information Processing Targeted Programmes (Schwerpunktprogramm Mikroelektronik und Informationsverarbeitung, MEIP) and the smaller “Biotechnology and Gene Technology Programme”<sup>1</sup>. The fact that the MEIP Programme was deemed a full success at its time opened the way for other technology policy measures. Indeed, already in 1987, when the MEIP Programme was still active, discussions in parliament and the federal bureaucracy alike, led to the Innovation and Technology Fund (Innovations- und Technologiefonds, ITF), the first funding instrument directly aiming at the financing of technology in Austria.

These following years were formative for the new policy field. Whereas the MEIP and Biotechnology Programmes were the very first steps of Austrian technology policy, in which different policy actors made their very first efforts to cooperate in the development and deployment of technology programmes, the first enduring structure of the policy field was the ITF. With the creation of the ITF a trajectory was chosen for the Austrian technology policy, which has effects impacting on the policy field until the present day. With the ITF practices chosen, norms and values developed and forms of cooperation evolved, which still determine Austrian technology and innovation policies. Examples range from the way in which policy experts’ knowledge is utilised to the fact that the ITF guidelines are still in use almost two decades after they have been developed – even if they have been subject to marginal changes.

This paper is concerned with the question, if this beginning institutionalisation of the policy field led to the solving of the problems that had arisen with the MEIP-Programme, namely coordination problems between the science ministry (Bundesministerium für Wissenschaft und Forschung, BMWF), the transport ministry (Bundesministerium für öffentliche Wirtschaft und Verkehr, BMöWV), the economics ministry (Bundesministerium für wirtschaftliche Angelegenheiten, BMWA), the Federal Chancellery (Bundeskanzleramt, BKA) and the finance ministry (Bundesministerium für Finanzen, BMF) as well as problems with the administration of the complex programme, such as lengthy decision making procedures. In

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<sup>1</sup> For a description and analysis of this first Austrian Technology Policy Programme, see Biegelbauer 2005.

the analysis of the ITF's history not only classical social science categories such as interests and power, but also a policy learning perspective will be employed (Hall 1993, Sabatier 1998, Maier et al 2003, Biegelbauer 2005). Therefore, it will not only be assessed "who got what with which effect" (Lasswell 1950), but also if policy making processes and policy outcomes can be explained when the lenses of learning approaches are applied. Has there been experiential learning in the creation and the reforms of the ITF? Which policy instruments have been used during the lifetime of the ITF to gather experience and knowledge? Have the stocks of knowledge of the involved actors changed, if yes in which ways and how do the actors qualify these changes? What functions had national and international role models in these changes? Finally, a closer look at the manifold reform efforts targeting the ITF is taken.

The rest of the paper is organised as follows: first the history of the ITF is going to be depicted. Then a few key problems of the ITF will be discussed. Next comes a section on types and roles of the knowledge used in the policy process. A last section will take a look at the occurrence, nature and explanatory value of policy learning.

## The History of the ITF

As was mentioned before, in the 1980ies technology policy was a completely new field in Austria. Whilst higher education policy was institutionalised in the education ministry (Bundesministerium für Unterricht und Kunst, BMUK) and research policy gained institutionalisation through the research promotion act (Forschungsförderungsgesetz) of 1967 and the foundation of the science ministry in 1970 (Fröschl 1976, Fischer 1985, Gottweis/Latzer 1997), the institutionalisation of technology policy followed only with the first technology policy programme, the MEIP Programme. The MEIP Programme was active from 1985 to 1987 in the form of an independent policy measure. It had been aimed at raising the competitiveness of Austria in reaction to rising unemployment levels and the failure of standard economic policies as they had been in use until the early 1980ies. The MEIP Programme entailed a cooperation between the science ministry and the transport ministry to the end of financing research and technological development connected with microelectronics and information processing. In its essence it was a programme trying to diffuse the new technologies throughout Austrian research institutions and the economy. In a close cooperation the science ministry and a number of scientific institutions financed by the ministry were to evaluate the scientific innovativeness and feasibility of proposals of Austrian firms. Similarly, the transport ministry and the Finance Guarantee Society (Finanzierungsgarantiesgesellschaft, FGG) were to evaluate the economic feasibility and innovativeness of the applications (Biegelbauer 2005).

This set-up necessitated a close cooperation between several actors, the most important of which were part of the board responsible for making the final evaluation of the applications, the Technology Financing Commission (Technologie Finanzierungs Kommission, TFK). Most importantly, the ministries of science, transport, economics and finance were part of the TFK, together with the Federal Chancellery. The level of cooperation that was necessary due to these arrangements was very uncommon for Austrian policy making in the mid-1980ies and led to a number of coordination problems, especially between the science and transport ministries. These problems led to an only partial fulfilment of the original goals of the MEIP Programme, amongst which was prominently featured a fostering of cooperation between research institutions and firms in high-tech sectors. As the evaluation at the end of the programme shows, these goals were not reached with only about one third of the projects being of cooperative nature (Hutschenreither et al 1991).

Also science ministry officials had complained about complicated routines and the amount of extra work that had to be carried out by the ministry. Moreover, whilst the programme was relatively large when compared with programmes in the research policy field, it was small in comparison to economic and industry policies. The ministry officials therefore were favouring the idea of a new fund that was to finance technology and innovation, which was discussed in 1987. The new fund was prepared by a working group including the very same people that

were part of the TFK of the MEIP Programme. When the bill regulating the ITF entered the floor of the Austrian parliament in November 1987 one of the house's rare discussions on technology policy ensued.

### ***Parliamentary Discussions***

On the 20 November 1987 the finance committee of the Austrian parliament had passed the bill on the ITF with the votes of the social democratic and conservative members of parliament. At this time the Social Democratic Party (Sozialistische Partei Österreichs, SPÖ) and the conservative People's Party (Österreichische Volkspartei, ÖVP) formed a coalition government with an absolute majority. An important part of the coalition agreement had been that the Austrian state owned industries should be privatised, including electrical utilities. Several of these utility companies were to be sold during the next four years. The interests of these 8 milliard Austrian Schilling were to form the funds, which should be dispersed through the ITF.

The right-wing Freedom Party (Freiheitliche Partei Österreichs, FPÖ) heavily criticised the bill amongst other things on grounds of staying within the logic of the grand coalition, which had divided most important posts in politics (and especially in the public economy) in a conservative and a social democrat sphere of influence. Indeed, of the first 500 million Austrian Schilling (ca. 36 million €), 250 million Schilling were to flow into programmes of the transport ministry, which was led by the social democratic minister Streicher, and 250 million Schilling in science ministry programmes, then led by the conservative minister Tuppy. The Freedom Party also criticised the complicated set-up of the ITF, which made it necessary that in the framework of a steering committee (the Kuratorium) not only the science and transport ministries, but also the economics ministry, the finance ministry and the Federal Chancellery would coordinate their activities. The Kuratorium was to be led by Chancellor Vranitzky, who would have the last say on the programming of the ITF and the division of funds amongst the ministries. Representatives of the Chambers of Labour and the Economy were also part of the body, as were representatives of the Social Democratic and the conservative Parties. The other problem was seen by the FPÖ in the fact that the new ITF was to be the fourth fund financing research, technological development and innovation, besides the FWF (Basic Science Fund, Fonds zur Förderung der Wissenschaftlichen Forschung), the FFF (Applied Science Fund, Forschungsförderungsfonds der gewerblichen Wirtschaft) and the ERP (European Recovery Programme).

In the very same debate representatives of the grand coalition provided the reasoning behind the ITF, namely that Austria in the mid-1980ies had a problem in transforming basic science results into applied technology, which was detrimental for the success of companies. This lag of Austrian technology in comparison to other countries had already been diagnosed by the "Beirat für Wirtschafts- und Sozialfragen", an important think-tank of the Austrian

social partnership in which experts from the chambers of labour and the economy as well as independent experts were preparing policy papers, specifically for economic policies.

The discussion makes also transparent that despite the fact that the bill was backed by both coalition partners, social democrats and conservatives, differences between representatives of these parties still existed. One issue was that the social democrats wanted to fund both research institutes and firms, whilst the conservatives initially wanted to fund firms only. Both parties compromised in making it possible for research institutes to be funded also, even if only firms could apply for funding. The parliamentary protocols also show that on two different occasions the comparison with other OECD countries' expenditures on research and technological development serves as an argument for backing the ITF bill.<sup>2</sup>

### ***ITF: A Historical Overview***

The law on the ITF (BGBl Nr. 603/87) became active on 1 January 1988. In the aftermath of the parliamentary discussions guidelines had to be found for the new ITF. This was quickly accomplished: The same group of people, consisting mainly of the ministries concerned with science and technology, the social partners and the social democrats and conservatives, which had already worked on the ITF law, now had worked out guidelines on the basis of the law by February 1988. The guidelines stipulated a maximum of 50 % of finance of the project costs by the ITF. Funding through several sources, private and stata, would be possible, with a ceiling of 75 % for funding by the state.

The structure of the ITF consisted of a formal and an informal part (compare with figure 1). In the discussions on the new fund the idea developed, that the institution should be led and coordinated by an interministerial committee which should be headed by the federal chancellor. This ministerial committee was also stipulated in the law, in the form of the ITF board (Kuratorium). The informal part of the organisation consisted mainly and most importantly of the ITF committee (ITF-Ausschuss). The Kuratorium consisted of the chancellor, the minister of economics, the minister of finance, the minister for public economy and transport, the minister for science and research, one representative of the chamber of labour and chamber of the economy each as well as two representatives of the social democrats and the conservatives. The law states that the Kuratorium is responsible for creating targeted programmes, deciding on the funding, constructing guidelines, coordinating the activities of the fund and even deciding on the larger project proposals. The ITF committee in essence was the old TFK which had been established in the framework of the MEIP Programme. It soon turned out to take on a number of the tasks, which by law would have been the responsibility of the Kuratorium. The committee discussed the targeted

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<sup>2</sup> Stenographisches Protokoll Nationalrat, 17. Geschäftsperiode, 36. Sitzung, 24. November 1987, S 4111-4145.

programmes, funding decisions, reform proposals and it coordinated the day-to-day activities of the ITF.

Moreover, during the life of the ITF the committee, which was neither mentioned in the ITF law, nor in any of its amendments, more and more took over the role of the Kuratorium. A few years into the existence of the fund the ITF committee made all important decisions, with the Kuratorium meeting once a year in barely two hours time and in essence just signing off what the ITF committee had proposed before. From 1996 until mid-1999 the Kuratorium did not meet anymore, its responsibilities being completely taken over by the ITF committee. Interview partners noted that each time when they presented the governance structures of Austrian science and technology policy in international settings, this aroused envy by other colleagues due to the fact that the main instrument of Austrian technology policy was headed by the federal chancellor (interviews 2-5, 3-5). Yet, as one interview partner noted, “what quickly goes up the political agenda, quickly comes down, too” (interview 2-5), a sentence very well describing the fate of the ITF.

The ITF in 1988 started with five targeted programmes, the largest of which was the Microelectronic and Information Processing Programme. The MEIP Programme was active until the end of 1990, similar to the Programme on Biotechnology and Gene Technology. By the end of 1990 the first workshop of the ITF committee was being held during which the evaluation of the MEIP and Biotechnology Targeted Programmes was presented (Biegelbauer 2005). Moreover, the results of a large study on technology policy in Austria, the Austrian Technology Monitoring System (ATMOS) study, was presented. The ATMOS study was to create the very bases for the decisions on technology policy in the framework of the ITF (Griessler 1995, 2003).

As a result of these discussions the ITF obtained a new raised profile, its new mission statement insisting that the ITF in the future will be a strategic coordination instrument of the federal technology policy and will fulfill its special task in the framework of the economic policy. In the framework of the Austrian accession to the European Union, the country became part of the European Economic Area in 1994. A working group of external experts made recommendations on a new mission statement of the ITF in 1995, which was adopted in 1996. The new mission statement spoke of a more integrative and cooperative approach towards science and technology policies, consisting of technology programmes which not only would provide funding, but also aim at the establishment of infrastructure and human resources, knowledge and problem solving potential. It included a more strategic approach towards the goals of the fund, instruments allowing a better gathering of knowledge on planned as well as existing programmes.

Due to the rising budget deficit, in 1993 a new law on the ITF was passed with the effect that the ITF was not any longer funded from the interest on the 8 milliard Austrian Schilling from the privatisation of the electric utility companies, but from a theoretical fund of the size of 8

milliard Schilling. This had the effect that when the interest rates on the financial markets went down over the course of the 1990ies, less and less funding was available for the ITF - without any perspectives on additional funding.

During the lifetime of the ITF several other changes were made, too (compare with table 1). Beginning with 1995 the economics ministry began to play a bigger role in the management of the ITF. From then on the economics ministry was also entitled to run programmes with the funds of the ITF. A year later, in 1996, new guidelines had to be issued, due to the Austrian EU accession and a stronger engagement of Austria in the European Space Agency (ESA). In 1997 extra funding by the federal government, the so called technology milliards (Technologie-Milliarden) led to the creation of technology programmes which were run by the federal ministries outside the ITF. A gradual decline of the ITF's importance for Austrian technology policy ended with the new coalition government, formed of the conservative Peoples Party and the right-wing Freedom Party in 2000, which first did not provide any money for the ITF and in 2003 finally dissolved the fund.

## Key Issues

### ***Coordination and Control***

From begin on, with the introduction of the MEIP and Biotechnology Targeted Programmes, the question of coordination was of key importance in Austrian technology policy. Already then there was a competition for funding and influence amongst the different ministries. This situation was exacerbated with the introduction of more money, more actors and more structures in the still relatively new policy field. The science and transport ministries were the original actors in the field and they were confronted with the Federal Chancellery which had coordination functions during most of the 1980ies and 1990ies, with the exception of the years of chancellor Sinowatz (1983-1986). Moreover, the finance ministry early on tried to keep a lid on the budgets of the technology policy actors. Its influence increased markedly with the growing demand for programmes, which in the case of the ITF was not met by an increase of funds during the second part of the 1990ies. Finally, the economics ministry during the first years of the ITF had to stay on the side lines, but soon tried to have a more direct say and to gain access to the ITF fund. This was the case in 1995, when the economics ministry finally got its share out of the ITF.

When it became clear that the Kuratorium of the ITF would neither meet often enough, nor devote enough time for the problems at hand, the informal ITF committee that initially was just to make funding decisions made an effort to step in. During the first half of the 1990ies the ITF committee indeed was the only institution coordinating technology policy in Austria (interview 2-5). According to an interview partner the body had a “pedagogical effect”, when other agencies did orient themselves on the papers and funding profiles of the ITF (interview 2-5) – perhaps because the most important institutions in the field were present in the ITF committee and many of the persons representing these institutions were also sitting in boards and committees of other agencies concerned with research, technology, industry and economic policies. During the 13 years of its existence the ITF committee found a number of solutions to cope with the problem of coordination and control, including several reform committees, thematic committees, committees preparing targeted programmes and policy papers – some of these temporary bodies including external experts and other representatives of the ITF committee in changing constellations. Some interview partners saw this diversity as a strength, others as weakness. Two interview partners thought that it was important that no technology policy actor was capable of pushing his agenda alone and dominating the others, so that all actors had to communicate with each other (interviews 1-3, 2-4), whereas others saw the ITF as locked in a stalemate (interviews 2-2, 3-5, 3-6).

Another instrument coordinating Austrian technology policy developed alongside the ITF. An informal group was formed, the civil servants heading the directorates with technology policy competencies in the science, transport and economics ministries as well as the Federal

Chancellery. Each ministry typically would send three persons to these meetings held under a rotating chairmanship in one of the four ministries. The meetings were held from the mid 1980ies until the early 2000s and worked mainly on the basis of personal acquaintance of the top officials. The main strength of the group, based on its informality, was that it could react quickly to new problems. This was also its main weakness, as the missing ground rules of the group led sometimes to personal problems between the actors (interview 2-4, 3-5).

### ***A Dearth of Funding***

In the ITF law from 1987 there was a stipulation that the Austrian fees to the European Space Agency for 1988 could be taken from the funds of the ITF up to 70 million Austrian Schilling (approximately 5 million Euro). There was no further agreement on the budget of the ITF included in the law, but during the first Kuratorium meeting, chancellor Vranitzky decided that the available funds for 1988 would be divided in equal parts between the science and the transport ministries. From then on there was a yearly discussion between the science and the transport ministries on the Austrian fees for ESA. Since the science ministry had problems of paying the fees out of its regular budget it somehow had to use ITF funding. Yet whilst the science ministry insisted that the ESA fees were valuable contributions to the Austrian economy, the transport ministry simply stated that these were of no use for firms, but interesting only for research institutions and therefore outside of its competencies – and of its share of the ITF budget.

But science minister Busek, who was not only heading the conservative People's Party, but also was vice-chancellor in the grand coalition government, was an ardent defender of the Austrian ESA involvement. Over time he was assisted by a strengthening group of aeronautic firms, which saw ESA as a possibility to break into European markets. The firms were very much interested in the Austrian ESA membership, since ESA has a special way of distributing its funding, including a strict one to one *juste retour*, i.e. each member country receives an amount of contracts equalling what it has paid to ESA before as a fee.

In the years after 1988 the science ministry had to pay the ESA fees from its own share of the ITF, i.e. ESA funds were subtracted from that half of the ITF budget, which was reserved for the science ministry. Yet in 1993 the ongoing discussions, which were fiercely led by minister Busek, led to the transport ministry paying those parts of the ESA fees which were linked to its responsibilities in the field of telecommunications. By 1995, when Busek had left the science ministry, a new solution had been found: The science ministry could subtract the ESA fees from the ITF funds up until a financial ceiling of 250 million Austrian Schilling (18 million €). And the transport and economics ministries were to share the rest of the ITF funds. Yet in the same year there were already discussions in the Kuratorium meeting disputing the new rule: The new science minister Scholten, who was a social democrat, asked for 271 million Austrian Schilling (20 million €), clearly exceeding the 250 million Austrian Schilling, stipulated in the previous agreement. In 1995 the ITF had 485 million

Austrian Schilling (35 million €) at its disposal, so that after the 250 million Austrian Schilling for the Austrian ESA fees were subtracted, less than 120 million Austrian Schilling could go to the economics and transport ministries each. This situation did not change during the second half of the 1990ies meaning that the ITF, despite getting more ambitious, slowly sank into oblivion due to the smallness of the funds at its availability.

### ***Troubled Operations***

The discussions on the question if the ITF should become an independent organisation or not are reflected in the parliamentary protocols. Whilst the opposition criticised that there would be another new fund in the economic and technology policy fields, the coalition parties emphasized that the solution chosen was very economical: Not a new organisation would be installed, but two already existing funds, the FFF and the ERP, would build on their professional expertise and years of experience when carrying out the agendas of the ITF. Interestingly, in the preparatory meetings of the interministerial group preparing the ITF bill, discussions never centred on the question if the ITF should become an own organisation, but on the question of which existing fund should take over the agenda of the new ITF. This meant that the chosen institutional trajectory of Austrian technology policy was not left, since the new ITF would have a roughly similar structure as the Targeted Programmes on MEIP and Biotechnology – despite the problems of coordination that were visible in the operation of the targeted programmes. Of course, this also meant that the science and transport ministries would continue to be the dominant actors in the policy field.

At that time both the FFF and the ERP were well established, having been founded in 1967 and 1962, respectively. The FFF led an existence quite isolated from daily politics, anxiously guarding its independence. It was very much geared towards the bottom-up principle, according to which firms applied for research funding by handing in the proposals which followed broad based guidelines. The ERP similarly followed the bottom-up principle, yet was decidedly less adverse towards politics. Amongst other things this was due to the fact that the ERP was used to fund projects which were closer to application or which were infrastructure related. Moreover, the ERP until the mid-1980ies was part of first the Federal Chancellery and later the transport ministry. It was state secretary Lacina who had instigated the agentification and independence of the ERP on grounds of making the fund's operations more economical, faster and more responsive to the wishes of the economy. Nevertheless the ERP maintained a close relationship to the transport ministry, which was symbolized by the fact that the fund stayed with its offices on the premises of the transport ministry during the existence of the ITF.

Soon after the founding of the ITF the problem arose which proposals should be addressed to the FFF and which ones to the ERP. In the first meetings of the ITF committee a solution originally sought by policy makers was reinstated: The more application oriented projects should be addressed to the ERP whereas the more research oriented projects were to be

addressed to the FFF. This turned out to be a not feasible distinction, which however was never revoked for a seeming lack of better solutions. The solution found by the funds was an informal one: SMEs were advised to approach the FFF and large firms were to turn to the ERP with their applications. Of those firms approaching the FFF it was again the small ones that were taken into the normal programmes of the FFF, where it was decided in approximately six weeks if a proposal would be funded or not, whereas the ITF funding decisions were taking longer. As it was reasoned that larger firms would plan over longer periods of time, be better funded and have larger projects, a larger firm approaching the FFF would be shifted into the ITF. Therefore the decision if a firm would receive funding from the FFF or the ERP in reality was based purely on arguments of size and not on arguments of the content of the projects. An interview partner notes that it took several years until the ITF committee took up the problem again. The problems then were solved with the construction of new programmes in the mid-1990ies, which were more exclusive as to the content of the applications and the breadth of the targeted programmes (interview 2-5). Indeed it is pretty clear that the first ITF targeted programmes were quite widely defined. These loose definitions were qualified by some interview partners as a strength of the ITF (interview 2-5), whereas others emphasized that the breadth of the ITF programmes was a problem, and that they did not target specific technologies until the mid-1990ies (interview 2-2).

### ***Management Structures***

When judged solely by the ITF law and the then existing policy papers, the by the late 1980ies still new policy field of technology policy had a quite clear structure. Two ministries, the science and transport ministry, were coordinated by the Federal Chancellery in accordance with the ministry of finance, utilising the ITF for their policy activities. As can be easily inferred from everything that has been said afore, the political reality looked quite different. The political structures were quite unclear, leading to structural imbalances on several levels of Austrian technology policy.

On the political level the Federal Chancellery has displayed not much interest in getting involved in technology policy too much, a policy field which soon turned out to be dominated by political pickering. Moreover, most competencies and the largest share of the personnel as well as almost all the RTD policy funds were in the hands of the science and transport ministries. In addition, the chancellor was caught in a conflict between the social democrat Streicher heading the transport ministry and the conservative vice-chancellor Busek heading the science ministry. Even if not much money was involved compared with the overall budgets of the two ministries, there was always the danger that the conflict could get out of proportion and at least make the already complicated life of the coalition government even more complicated.

As has been mentioned before, the unclear political structures found their reflection in the set up of the funds. Whilst the other RTD related funds, the FFF, the ERP and the FWF, had

quite clear missions, the ITF was a much less common sense structure. Worse, especially the FFF was quite unhappy with the top-down structure of the ITF. The ITF indeed did not rest easily with the corporate culture, mission and organisational set up of the FFF which was completely geared towards the bottom-up principle. In this structure, the ITF never developed an own identity, it never had an own clientele, it had never had staff which saw itself as belonging to the ITF and, perhaps most importantly, it never had a political patron (interview 3-5). Indeed, the ministries treated the ITF sometimes as if they would not deal with a technology fund incorporating a number of targeted programmes, but as if they still would deal with contract research, the main instrument of Austrian RTD policy before the establishment of the targeted programmes. As one top level civil servant stated: “The beauty of the ITF was that we still could run the same programmes as before, but had less work with these” (interview 1-1).

The unclear structures on the level of politics and on the level of the funding agencies were reflected on the project level, too. As was mentioned before, in the first years of the ITF the targeted programmes were quite wide, so that they could incorporate a variety of different projects handed in by members of different firms and consortia, with quite different contents and operating in quite different subfields. Firms requesting information on ITF funding would sometimes receive information as an effect of which they would hand in a proposal at the FFF, receive a phone call by the ERP where the project proposal had been shifted to, and in the end receive funding from the ITF. This led to complaints from the side of firms, which were frequently confused (interview 2-5). Over time the ITF committee made an effort to react to these problems and developed programmes with clearer targets. Moreover, structures between the targeted programme and the project level were introduced, the so called umbrella projects. Project umbrellas had the task of combining several projects under one management. On the one hand, they were a reaction to the mixture of quite different projects, which were running under the heading of a certain targeted programme at any given time. On the other hand, they were a reaction of the ministries on the agencies' seeming unwillingness to accept top-down structures.

## The Role of Knowledge

Political action is based on knowledge. In the case of the establishment of the ITF a large part of the utilised knowledge stems from the interactions between the political actors that were already involved in the two Targeted Programmes on MEIP and Biotechnology<sup>3</sup>. The two targeted programmes, which were the forerunners of the ITF in Austrian technology policy, were based on knowledge from a multitude of sources, mainly experiences from other Austrian policy fields, results of policy initiatives in Bavaria and Switzerland, which were visited by Austrian expert commissions, expertise gathered in the framework of the OECD and several studies commissioned to Austrian social scientists by the science ministry (Biegelbauer 2005). The main difference between the creation of the two targeted programmes in 1985 and the establishment of the ITF in 1987 was that in the latter case there indeed was already experiential knowledge available on the construction and running of technology programmes. It may have been because of the existence of some familiarity with technology policy programmes, that the interministerial expert group working on the ITF bill neither did discuss the experience of other countries nor based their actions on the expertise of policy consultants or the OECD.

However, this was not the case for the construction of the concrete ITF programmes. In discussions on these programmes frequently references to the OECD can be found, with however at least some of these being likely to fulfil only legitimacy functions. In other cases closer looks were taken at foreign countries, primarily Germany. In the case of the Seed Financing Programme active from 1989 till the present day, a civil servant, who took the role of a policy entrepreneur for the development of this initiative, had taken some ideas from a stay in the USA and combined them with elements of a German programme on seed financing (interview 2-10). In the case of the FlexCIM programme running from 1991 to 1996, not only the ATMOS study was taken as a basis, but also three international experts were asked for their opinion. For the Targeted Programme Software Technology, active from 1993 to 1998, the EU's "European Systems and Software Initiative" (ESSI) was a role model.

### ***Consultants and (other) Internationalisation Factors***

With the establishment of the ITF the ministerial actors soon recognized that the layer of experts which they could ask for knowledge on technology policy was quite thin in Austria. Soon a group of social scientists and economists from the University of Graz, the Technical University of Vienna, the Austrian Research Centre Seibersdorf (Österreichisches Forschungszentrum Seibersdorf, ÖFZS) and the Economic Research Institute

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<sup>3</sup> That is not to say that the establishment of the ITF is already explained by an analysis of the knowledge used for the creation of the fund. An explanation has to take into account that the main political actors on the ministerial level had no interest to fundamentally change the way policies were formed and the funding of projects was taking place – as long as their influence on these processes would remain constant.

(Wirtschaftsforschungsinstitut, WIFO) was formed under the tutelage of the science and transport ministries. In a lengthy and rather irksome process these researchers began to cooperate and developed the Austrian technology monitoring system (ATMOS), which was a policy instrument combining elements of a foresight study, sector analyses and macroeconomic models (ATMOS 1990).

In the framework of this initiative six technological areas were to be covered, namely process technologies, computer integrated manufacturing, new materials, medical technologies, laser technologies and transport technologies. The main goal of ATMOS was to provide new knowledge in the form of a steady stream for the decision making processes in Austrian technology policy. This main goal is underscored by sub goals like the specification of priority fields, the creation of an accepted proceeding of priority setting, the establishment of a research group for technology policy research, the promotion of coordination between the technology policy actors and the legitimation of technology policy through scientifically based knowledge produced by ATMOS (Griessler 1995, 157). These goals should have been reached through the means of literature reviews, expert interviews, workshops with international experts and the creation of a databank on leading Austrian enterprises and their innovative behaviour. Together with the monitoring of national and international technology policies the analysis of the impact of certain technologies on Austrian enterprises should have led to recommendations, options and measures for Austrian technology policy.

An interim report of the ATMOS group led to intense discussions in 1990 and subsequently to the reformulation of the project, which had been deemed too technical by large parts of the ITF committee, the target audience of the presentation. Griessler points out that ultimately ATMOS was not rejected because of the perceived shortcomings of the programme, such as the technocratic approach not following systematic and objective criteria a disregard for the microeconomics of innovation as well as concerns on practicability and a more general methodological critique. Rather the initiative was drawn into the conflicts between the science and transport ministries, which were trying to protect their respective spheres of influence. ATMOS was also affected by the fears of several actors to have their freedom to choose the course of technology policy infringed by a new technology policy instrument, which would prescribe a course of action based on scientific analyses and international experiences (Griessler 1995).

Although the study is cited as a basis for several targeted programmes inside the ITF, it failed when measured in terms of its own grand design. And although the initiative itself did not lead to a reformulation of Austrian technology policy, an important group influencing Austrian research, technology and innovation policies until the present, the TIP Programme (technology, innovation, policy advice) came out of it. TIP was a network of experts, financed by the science, transport and economics ministries, and consisting of experts from ÖFZS and WIFO. The TIP programme started in 1993 and has been renewed several times since then, expanding its network to Joanneum Research. Since its inception TIP's experts have

been involved in most technology policy initiatives of the Austrian federal government and in many regional ones. The network of policy consultants consists of a core of approximately a dozen experts and another dozen less senior researchers.

These policy consultants were, together with the EU accession and general globalisation pressures one of the three factors of the internationalisation of Austrian technology policy. TIP experts were both driving internationalisation and driven by internationalisation pressures. On the one hand the researchers looked for expertise and additional funding on the international level, on the other hand the very existence of the TIP network was an effect of the requests of technology policy actors, which were driven by the internationalisation pressures felt by the Austrian government.

The development of Austrian technology policy in the 1990ies, amongst other factors, can be seen as a co-development of this network of policy consultants and a growing and increasingly institutionalised bureaucracy. Knowledge was produced both by consultants and political actors. Whilst one way to transfer knowledge from the experts to the policy makers in politics and administration were studies and presentations, several interview partners indicated that many studies, even in the case they were read, had no immediate effects, with one interview partner pointing out, that the main effect of the TIP network was not caused the studies they produced, but was the pool of knowledge that could readily be accessed by policy makers by simply picking up the telephone and calling one of them (interview 2-4).

In the 1990ies and 2000s it became increasingly difficult to differentiate between knowledge stemming from international and national sources, since national and international institutions were increasingly intertwined, slowly leading to a multi level system of governance in the policy field. Whereas knowledge of the then for the policy field most important international actor OECD in the 1980ies travelled through studies, policy papers and personal acquaintances in a framework of ministerial conferences, the channels through which information would flow from the OECD headquarters in Paris to Vienna were less clear beginning with the 1990ies. Two forms of knowledge transformation can be discerned: First, knowledge would be transported through the TIP network, whose participants accessed the OECD through taking part in working groups and conferences, partially at the side of civil servants. One interview partner spoke of a “condensation of knowledge” at the OECD meetings, indicating that it was not only new ideas that he would be confronted with, but also a process of updating the already available knowledge (interview 2-1). Second, the OECD was also a main factor in the internationalisation of administrative procedures, which began already in the 1970ies with the inflow of a generation of more internationalised civil servants, who could speak English (interview 2-8).

The Austrian accession to the European Union had a similar effect on the national technology policy community, civil servants and policy consultants alike, as had the intensifying contact with the OECD 20 years before. For the civil servants the EU accession

meant a rapid internationalisation, the brunt of which was felt by a new multilingual generation of civil servants hired in the first half of the 1990ies, shortly before the federal bureaucracy was forced to reduce its staff. The need to respond in writing to the proposals of the European institutions, especially the EU-Council with its many working groups, and the steady stream of papers being produced in the framework of these structures led to an increasing formalisation of administrative procedures. Before the EU accession, these had, especially on the top level of the Austrian federal bureaucracy, often been based on mutual understandings and gentlemen agreements rather than on more formalised procedures. The informality of the Austrian Post WW II bureaucracy was based on the role of trust (Fukuyama 1996) as well as on the political culture, structured by the social partnership, a network of neo-corporatist arrangements dominating Austrian policy making during the second half of the 20<sup>th</sup> century (Pelinka 1981, Karhofer/Tálos 1996, Tálos/Kittel 2001).

For the policy consultants the accession to the European Union also necessitated a further internationalisation, since they not only were confronted with loosely structured working groups as in the OECD context, but with sometimes closely knit networks formed around EU policy making procedures. This is especially the case for the European Commission, which by approaching policy experts not only tries to gain expertise, but also makes an effort to broaden its base of decision making through the inclusion not only of interest groups, but also of experts (Pernicka et al 2002, Stone Sweet/Sandholtz 2002). Furthermore, the Austrian policy consultants were confronted with the needs of Austrian civil servants, who had to understand the new rules of the game as well as new issues they had not been confronted with before – Austrian RTD and innovation policy-making before the EU accession only rarely felt an urge to prepare opinions on programmes on marine technologies or jet planes as was the case with the policy finding mechanisms leading up to the framework programmes of the European Union (Biegelbauer 2003).

The accession to the European Union also meant for both policy makers and consultants alike that they were confronted with a multitude of new perspectives on policy making, leading to a further increase in, often comparative, studies being produced by Austrian consultants.

Yet not only consultants and civil servants, but also the RTD funds had to face new issues and new ways of policy making. Both the FWF and the FFF always were quite client driven organisations, following the bottom-up principle. For both organisations this meant that over the course of the 1990ies they would have to change their way of operations. In the case of the FWF this led to the partaking of the FWF in a multitude of initiatives, which were bi- and multilateral. Since its existence there had been memoranda of understanding between the FWF and foreign funding organisations on bilateral levels. These were quickly replaced in their importance by regional and European initiatives, many of which were not linked to the EU, almost all of which however were linked to a broader based Europeanization process (interview 2-7). Whilst the FFF was less confronted with cooperative research between

partners in different countries, it nevertheless felt the effects of internationalisation. The FFF has a long history of bilateral contacts with other research funding organisations, it was also part of the Six Countries Programme initiative, which was started in 1975 by the Netherlands, Germany, France, the UK, Ireland and Canada. Yet it was the accession of Austria to the European Union that led to the partaking of the FFF in the multilateral European initiative TAFTIE (The Association for Technology Implementation in Europe). TAFTIE has been described as a network of RTD funding organisations engaged in a number of exercises, in which experiences are exchanged and common studies carried out, leading to institutional innovations in the FFF such as new guidelines on evaluation, new monitoring systems, new management tools and new forms of studies (interviews 2-1, 2-2).

Paradoxically, the internationalisation of the 1980ies and 1990ies led not only to more interaction between national and international levels, but also to an increased communication between the different actors in Austrian technology policy. Whilst the behaviour of the federal ministries by and large can be best described as strategically oriented and motivated, communication behaviour changed in the absence of power related questions on the size of budgets and programmes. Indeed, communication was more cooperative, when other actors were taking part and when it centred on non power related topics. One example is the Platform Research and Technology Evaluation, a loose network of institutions of RTD and innovation policy planning and funding, including science, transport and economics ministries, FFF and FWF, as well as the TIP partner organisations. In the framework of the platform, which was funded in 1996, discussions were led in the form of workshops and conferences on all forms of evaluations of RTD and innovation policies. Another example is the increasing communication between funding organisations, which has been pointed out in several interviews (interviews 2-2, 2-7). Due to the coordination of RTD related topics in the Council working groups, the federal ministries were also forced to coordinate their positions. Since the science ministry's coordination function in EU policy making was most of the time not disputed, there were only few problems connected with EU related RTD policy coordination (Pernicka et al 2002).

## Reform Efforts and Policy Learning

Large parts of social science and especially of political science try to explain political action by framing it in terms of what Hugh Hecló has termed “powering”, that is behaviour related to the defence of interests. Until now relatively little energy went into an alternative explanation, which centres on behaviour that could be termed “puzzling” (Hecló 1974). Puzzling stands for the search for solutions for policy problems, a term closely related to policy learning (Hall 1993, Sabatier 1998, Maier et al 2003). Indeed, policy learning here is the production of knowledge, skills or attitudes, which are the results of the assessment of other policies.

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”.

This has several ramifications 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 (Biegelbauer 2005, 3).

As has been pointed out before, there has been little assessment of experiences of the two previous targeted programmes on MEIP and Biotechnology and Gene Technology in the establishment of the ITF. Rather the ITF in its set-up followed the path chosen with the creation of the targeted programmes. The major difference was that an interministerial committee was developed, later called Kuratorium, in which top-level decision making was to take place. One explanation why there was so little learning from the experiences of the two targeted programmes is that there was too little time between the start of the programmes in 1985 and the creation of the ITF in 1987.

Yet the two targeted programmes’ experiences had also little effect on the first programmes of the ITF. Two reasons are discernable: First, during the evaluation of the two targeted programmes there were intense debates about what actually should be evaluated and what the original goals of the two targeted programmes had been (interview 2-5, Biegelbauer 2005). Secondly, several interview partners pointed out that the evaluations simply came too late to have an effect on the first wave of programmes of the ITF, whereas the following programmes already looked quite different, so that there could be little direct transfer of experiences from the first programmes to the second wave. As one interview partner pointed out, “if we had known the results of the evaluation ... we would have had to change our next

steps” (interview 2-5). This line of reasoning led to policy learning on the level of programme management and design: pilot phases and mid-term evaluations were adopted for the second wave of programmes in the early 1990ies, such as the FlexCIM programme, allowing for an assessment of the results of the first programme phases and according changes in set-ups. These instruments then allowed learning on the operational level of day-to-day operations as well as on the level of programme design.

On a more fundamental note the ITF was followed by a more or less permanent discussion about its tasks, its programmes and its structures during its whole 15 year history. Already in a session of the Kuratorium at the end of 1989, only two years into its existence, a reform of the ITF was planned. The reform effort led to a new mission statement, issued with a session of the Kuratorium at the end of 1990: In the future the ITF should be a coordinating strategic instrument of the federal technology policy in the framework of economic politics. In early 1992 a working group came to the opinion that the mission statement of 1990 had not been realized until now. Furthermore, it spoke of a competition between the ERP and the ITF with respect to the ITF operations and of the need to reform the ITF in order to react to the upcoming EU accession and the strong involvement in ESA. In 1992 there was a further call of the Kuratorium for a closer coordination of national and international technology policy positions in the framework of the Kuratorium.

These permanent reforms had quite different roots. First they were an effect of the ITF's relatively low level of institutionalisation – as has been stated before, the ITF neither had an own office, nor own staff, nor a political patron. The ITF therefore was always in a force field between the two established actors of Austrian technology policy, science ministry and transport ministry, the economics ministry which tried to come to a similar position as the two other ministries and the two intermediary funding organisations FFF and ERP, of which especially the FFF never was happy with the ITF's existence. Another layer of conflict was that science and transport ministries and later also the economics ministry wanted to spend more money on RTD programmes, whereas the finance ministry was more interested in following the goal of budgetary discipline and tried to keep a lid on spending. Whilst the former explanations are interest and power centred in the sense of Hecló's “powering” behaviour, another set of explanations is more learning centred, closer to Hecló's “puzzling”.

Here it has to be taken into consideration that the ITF was the first institutionalised policy instrument in a still quite new policy field. Therefore policy experimentation was not only relatively easy due to the quite low level of institutionalisation of the ITF, but it was also necessary due to the thin layer of experiences Austrian policy makers had made with technology policy programmes. In addition, the policy field was quite dynamic: internationally it was relatively new, with actors such as the OECD, the European Commission or UNESCO and UNIDO frequently forming new structures and institutions, which kept producing a steady flow of policy papers and events for all levels of policy making and administration. The dynamism of the policy field was underscored by the fact that it was one of the few

policy areas, which were not disputed after the budget crises of the 1970ies and 1980ies had led to a critical evaluation of many governmental programmes and, more general, the role of the state vis-à-vis society. There was a need for the ITF to react to this rapidly changing international environment, leading to opportunities for learning.

As was mentioned before, in 1993 an amendment to the ITF law changed the financial structure of the fund. In the same year first changes in programme management came into effect with the introduction of umbrella projects and there were repeated calls to introduce ecological and social aspects in the evaluation of project applications.

The umbrella projects and, three years later, the institutionalisation of programme management can be seen as learning related to the management of the increasing number of targeted projects in the framework of the ITF. With these new instruments policy makers tried to confront the complexity of running programmes, which were relatively broad and drew projects which were quite varying with respect to their content and the form, size and nature of the organisations cooperating in these projects. Moreover, umbrella and programme management structures were also ways to circumvent the FFF's and ERP's unwillingness to accept top-down-structures.

The introduction of programme management in 1996 was also a reaction to unintended side effects of the umbrella projects introduced earlier. As umbrella projects were evaluated and their success measured in terms of the size of the umbrella and the number of projects gathered in it, umbrella project managers tried to maximise the number of projects in their umbrella structure. This again led to umbrellas combining a colourful mixture of projects (interviews 2-1, 3-5).

Another unintended side effect of changes in the management structures was an overburdening of the management personnel due to the increasing complexity of the ITF operations, which in the second half of the 1990ies consisted of four levels: besides the project, there was the umbrella and the programme management levels, in addition to the political superstructure consisting of the ITF committee and the Kuratorium. As a result of the increase in management levels and actors participating in the ITF, the governability of the fund paradoxically rather decreased over time, despite all the efforts to increase it.

At the end of 1993 there was a renewed call for reform, this time issued by the federal government: the ITF should form a working group in order to produce a technology policy concept for the federal government of which the ITF should be a central part. Whilst science minister Busek rejected the first version of the technology policy concept, which had been calling for a strict division of political-strategic and operational levels in technology policy, it led to a further reform of the ITF in 1995. The reforms were quite far reaching: The economics ministry could also receive funding out of the ITF, the frequent subcommittees and working groups should be better integrated in the ITF committee, policy consultants

should be more frequently invited to the meetings of the ITF committee, the ITF should play a more strategic role in technology policy, there should be more evaluations of projects and programmes and the federal ministries should be more independent in their ways to use ITF funds.

In 1996 further changes were necessitated by the fusion of science and transport ministries into the new ministry of science and transport (Bundesministerium für Wissenschaft, Verkehr und kulturelle Angelegenheiten, BMWVK) and changes in the financing of ESA. Although the ITF diminished in importance relative to other programmes with the technology milliards leading to programmes run directly by federal ministries beginning with 1997 and the beginning agentification of the policy field with the foundation of the TIG (Technologie Impulse Gesellschaft) in 1998 as well as the increasing neglect of the ITF by the federal government manifesting itself by the fact that the Kuratorium did not meet for almost four years until May 1999, reforms on the operational level went ahead.

A number of these reforms, especially when directed at the division of budgets and the representation of ministerial interests in both Kuratorium and ITF committee, can be explained by the defence of interests of the main political actors in the ITF, the federal ministries for science, transport and later also economics, Hecló's "powering". Yet, a number of reforms can be better understood when framed in terms of "puzzling", or policy learning. While most interview partners were of the opinion that the ITF was the prime arena for learning in Austrian technology policy since the field came into being in the 1980ies, the way policy actors learned sometimes has paradoxical qualities.

One important instrument supporting policy learning in the ITF were evaluations. The introduction of evaluations was described by an interview partner as quite painful, reflecting the fact that in discussions in the early phases of the ITF charges were made that evaluations were just instruments for spying on people (interview 2-10). At least when asked 15 years later most interview partners thought that evaluations were important, but less because of supposed effects of experiential learning. The general opinion was that there was a sort of streamlining going on as an effect of expected evaluations, having "educational effects", "necessitating strategic planning" (interview 2-10), "learning how to learn" (interview 2-9) and "leading to learning about the effects of policy making" (interview 3-5).

As to the institutional background of learning, learning mostly did not take place in the Kuratorium, but rather in the framework of the ITF committee and there especially in the workshops taking place once a year (ITF-Ausschuss Klausuren). The main function of the committee with respect to learning behaviour was to facilitate an information exchange between the programme officers and the people in the committee, condensating the daily experiences into new routines and rules, a form of higher level "learning by doing". This, however, could take place only after the ITF committee had standardized its daily procedures, a process slowly advancing over the first years of the body's existence. It was

only then that the ITF committee could be used for more broad based discussions on technology policy (interview 2-10).

In evaluating the helpfulness of a learning approach in the analysis of the history of the ITF, two things should be mentioned. It is difficult to see learning behaviour other than on the operational level when following the ITF's progress over the 15 years of its existence piecemeal. Learning mostly becomes visible only when one takes a step back and looks at longer stretches of time. For example, it is difficult to see much policy learning when looking at the first two targeted programmes of Austrian technology policy and comparing these with the first programmes of the ITF two years later. Yet when widening the scope of analysis from two to five or, even better, ten years time an increase in professionalisation becomes visible: Programme descriptions become more detailed, guidelines are clearer, policy instruments supporting policy learning such as ex ante and ex post evaluations and monitoring procedures become standard procedure.

While the application of a learning approach leads to a better understanding of the changes the ITF went through during its 15 year history, a comprehensive analysis of the fund becomes only possible when the learning approach is combined with an analysis of interest structures and power relations, a combination of Hecló's "puzzling" and "powering". The ITF's history becomes clearer when the almost complete absence of the highest levels of politics, both from the side of the legislative and executive branches, the rivalries of the federal ministries concerned with RTD competencies, the lack of an ITF office and the bottom up orientation of the FFF and partially also the ERP are taken into consideration as the framework conditions in which learning could take place.

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## Annex

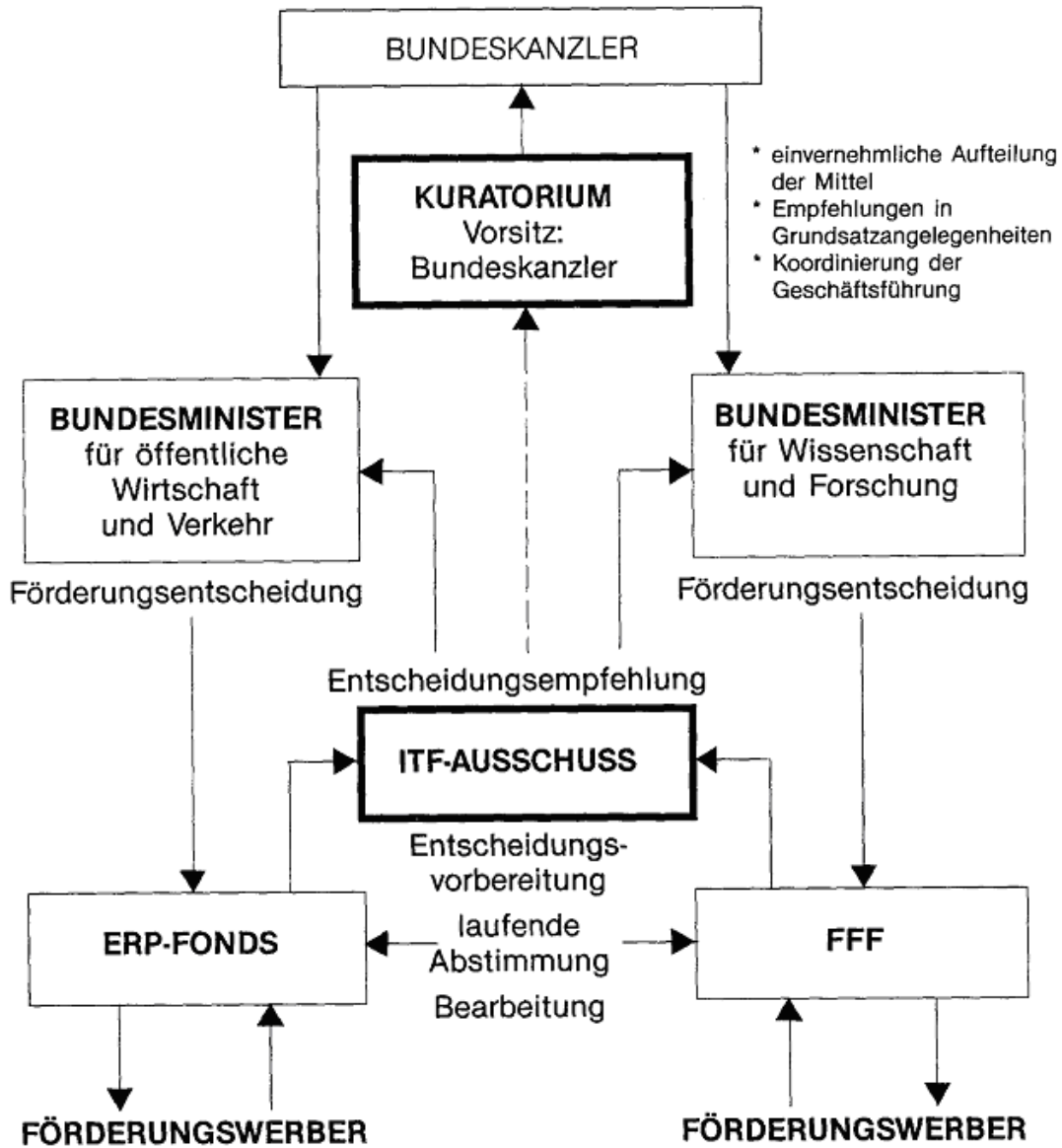
### List of Abbreviations

ATMOS	Austrian Technology Monitoring System
ATS	Österreichischer Schilling
BKA	Bundeskanzleramt
BMF	Österreichisches Bundesministerium für Finanzen
BMöWV	Österreichisches Bundesministerium für öffentliche Wirtschaft und Verkehr
BMUK	Österreichisches Bundesministerium für Unterricht und Kunst
BMwA	Österreichisches Bundesministerium für wirtschaftliche Angelegenheiten
BMWF	Österreichisches Bundesministerium für Wissenschaft und Forschung
ERP	European Recovery Programme
ESA	European Space Agency
EU	European Union
FFF	Forschungsförderungsfonds der gewerblichen Wirtschaft
FGG	Finanzierungsgarantiefonds
FWF	Forschungsfonds zur Förderung der Wissenschaftlichen Forschung
GDP	Gross Domestic Product
ITF	Innovations- und Technologiefonds
MEIP	Microelectronics and Information Processing
OECD	Organisation for Economic Cooperation and Development
ÖFZS	Österreichisches Forschungszentrum Seibersdorf
RTD	Research and Technological Development
SME	Small and Medium Sized Enterprises
TFK	Technologie Finanzierungs Kommission
TIP	Technology, Innovation, Policy Advice
WIFO	Wirtschaftsforschungsinstitut
WW II	World War II

**Table 1 Overview Innovation- and Technology Fund, 1986-2003**

1986	TFK of MEIP Programme prepares ITF Law
1987	ITF Law passed (BGBl 603/1987)
1988	The MEIP Programme is one amongst four programmes run by the newly created Innovation and Technology Fund (ITF)
1990	The MEIP Programme is evaluated
1990	The ATMOS study starts
1993	New financial basis for ITF (BGBl 972/1993)
1993	Umbrella projects introduced
1995	New ITF mission statement
1995	BMwA can also participate in ITF programmes
1996	BMWVK is formed out of BMWF and BMöVV
1996	New ITF guidelines
1996	New ITF management structure introduced (programme management)
1997	Technology milliards of the Austrian federal government
2000	BMVIT and BMBWK are created out of BMWV and BMUK
2003	ITF is dissolved

Figure 1 Innovations- und Technologiefund, Organisational Structure



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