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Policy Case Study Austria¹

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1 Introduction

In this paper, three examples of Austrian programmes aiming at the encouragement, fostering and facilitation of network formation² are presented.:

- the Kplus programme of the Ministry of Transport, Innovation and Technology,
- and
- the K_{ind}/K_{net} programme and a
 - programme which aims at the formation of 'export-clusters' which both are funded by the Ministry of Economics and Labour Affairs.

These programmes are representative examples for a shift in Austrian technology policy towards programmes trying to foster the linkages in the Austrian National Innovation System. It has long been claimed that both the linkages between enterprises on the one hand and between the science system and enterprises on the other hand constitute major weaknesses of the Austrian Innovation System (see for detailed characterisations of the Austrian Innovation system e.g. Hutschenreiter / Jörg / Polt 1996³, Technologiepolitisches Konzept 1996⁴, Technologiebericht 1997⁵, Technologiebericht 1999⁶ and Green Book on Austrian Research Policy 1999⁷).

The Austrian enterprise sector can roughly be characterised by the following features: a comparatively large share of SMEs, a small number of multinational corporations of Austrian origin, and a considerable share of foreign-owned firms, especially among the R&D intensive sectors like pharmaceuticals, biotechnology, electronics and software production. In terms of innovative activities, Austrian firms perform quite well (high share of innovative enterprises), but their focus is predominantly on incremental innovation, mainly along existing technological trajectories. Only a minority has the capabilities for research-intensive, 'breakthrough' technological innovation. In terms of industry structure, resource- and scale-intensive sectors still occupy the mayor share of Austrian industry (see European Report on Competitiveness 1998). The Austrian science system is characterised by the large share of universities in public R&D expenditure, the small amount of R&D at universities financed by the enterprises and the small share of public research centers.

Thus, between these very different types of actors in the enterprise sector, as well as between those actors and the science system there are considerable barriers to cooperation (see Schibany 1998).

Against this background, the fostering of cooperative relations in the Austrian National Innovation System of Austria became a focal point of recent Austrian research, technology and innovation policy.

2 Case Study 1: The Kplus Programme

2.1 Background information on the programme⁸

The programme was started in late 1998, when the former Ministry of Science and Transport – now Ministry of Transport, Innovation and Technology (BMVIT) - entrusted the Technologie Impulse Gesellschaft (TIG), a specialised funding institution, with the responsibility for managing the programme. These responsibilities included: to carry out specific information activities, the organisation of selection processes and the establishment and monitoring of the competence centers.

² The notions of 'cluster' and 'networks' are used interchangeably in the context of the description of these programmes. E.g. the K_{ind}/K_{net} programme aims at "creating networks and centers of competence to form the basis of industrial clusters". On the other hand, the 'export cluster' initiative – despite its name – comprises rather networks.

³ http://www.oecd.org/dsti/sti/s_t/inte/nis/Archive/First_phase/oe-nis.pdf

⁴ See <http://www.bmwf.gv.at/4fte/materialien/tkbr/tpkkf.htm>

⁵ see <http://www.bmwf.gv.at/4fte/materialien/techber97/index.htm>

⁶ See <http://www.bmwf.gv.at/4fte/materialien/techber99/index.htm>

⁷ see <http://www.bmwf.gv.at/4fte/materialien/gruenbuch/index.htm>

⁸ A more detailed description of the programme is given at: <http://www.kplus.at>

The selection process of the centers introduced a novelty into Austrian technology funding schemes, insofar as it is a *competitive process* between different proposals. Calls for proposals are launched regularly. There is no pre-selection of technological/scientific areas or types/status of proposers. Consortia bidding for the grant are formed in a self-organised way between business and academia. Proposals are evaluated on the basis of

- their scientific and technological quality,
- their ability to ‚cluster‘ existing scientific and economic competence into ‚critical masses‘,
- their estimated economic benefit for Austrian companies and
- the quality of the business plans.

The main instrument of the evaluation process is peer-review.

So far, the following 12 competence centers are operative or have been selected for funding:

Kplus – Competence Centers										
	Status	Programme Funding [in Mio AS / MEURO]	Total Project costs [in Mio AS / MEURO]	Duration (years)	Partners: Number	Of which Enterpr	Uni	Pub. Res. Center		
Advanced Computer Vision (ACV)	operational	91,92/ 6,6	153,2 / 11,10	4 (+3)	15	11	3	1		
Carinthian Tech Research (CTR)	operational	79,8/ 5,8	133/ 9,66	4 (+3)	10	6	4	0		
Applied Electrochemistry (ECHEM)	operational	113,4/ 8,2	189/ 13,73	4 (+3)	43	37	4	2		
Forschungszentrum Telekommunikation Wien (FTW)	operational	129/ 9,4	215/ 15,62	4 (+3)	17	14	3	0		
Leichtmetall-Kompetenzzentrum Ranshofen (LKR)	operational	94,8/ 6,9	158/ 11,48	4 (+3)	15	12	2	1		
Materials Center Leoben (MCL)	operational	100,8/ 7,3	168/ 12,21	4 (+3)	26	17	7	2		
Software Competence Center Hagenberg (SCCH)	operational	94,8/ 6,9	158/ 11,48	4 (+3)	21	14	7	0		
Center for Virtual Reality and Visualization (VRVis)	operational	77,4/ 5,66	129/ 9,37	4 (+3)	13	8	5	0		
Mechatronic Center Linz (MCL)	operational in 12/00	93,6/ 6,8	156/ 11,3	4 (+3)	29	24	3	2		
Wood Chemistry and Composites Competence Center Austria (WOOD)	operational	100,8/ 7,3	168/ 12,21	4 (+3)	12	7	4	1		
Competence Center for Bio-Molecular Therapeutics (BMT)	operational	102/ 7,4	170/ 12,37	4 (+3)	11	6	5	0		
Knowledge Management Center Graz (KNOW)	operational in 12/00	89,4/ 6,5	149/ 10,84	4 (+3)	16	11	3	2		
Total		1167,72/ 84,7	1946,2/ 141,43		228	167	50	11		

Source: T.I.G.

2.2 General features of the programme:

- Focus:** Kplus funds collaborative research facilities jointly run by enterprises and research institutions (universities, government research labs etc). Research carried out in the center should be pre-competitive. Individual projects run by the center should involve multiple partners.
- Target groups:** Industrial enterprises and research institutions which carry out high-quality research with high potential for economic application.
- Volume:** To ensure the formation of critical masses, some 'target size' indicators are used: centers should have an annual funding of 30-60 Mio AS (2,2-4,4 MEURO) and some 25-50 staff.
- Duration:** Centers are established for a period of 4 years, with the possibility of an extension (following an interim evaluation) for another 3 years. There is no a-priori set limit for the duration of the whole programme, but at the start it was estimated that some 20-25 centers would be a ceiling for Austria.
- Institutional setting and organisation:** There is considerable leeway for the organisation of internal relations between the partners. Most centers are organised as limited companies. There is a requirement for a minimum number of 5 industrial participants, in order to avoid 'single firm centers' and unfair preferential treatment which might have effects on competition.
- Instruments used:** Along with the subsidies, some help is provided in the preparation phase of the proposal and the establishment of the organisation of the center. Management advice is also provided throughout the duration of the project. Subsidies are in the form of grants, up to 35% coming from the T.I.G. Enterprises bear a minimum of 40% of the costs, the remaining 25% stem from other public sources.

2.3 Type and Focus of the programme

The main objective of the programme is to establish long lasting cooperative relations between enterprises and scientific institutions. 'Awareness of the network possibility' is provided by the p.r. activities for the programme (e.g. road shows). Given the long-term goals of the programme, 'building of trust and a shared knowledge base' is the main focus. While not providing complementary resources itself, the programme has the target of ensuring such pooling of resources to form 'critical masses'. For the 'organisation of the network', some basic requirements are set, but no active role is taken by the T.I.G. 'Search for partners' is left to the self-organisation of the network members. (see Table 1 in the Annex).

2.4 Characteristics of networks

- Vertical and horizontal:** Networks can (and do) take both forms.
- Geographic scope:** So far the centers are national, but international/global scope is not excluded.
- Organisational structure:** After an initial phase (18 months), in which the partners can organise as associations, they are expected to form a limited company.
- Duration:** The duration is much longer than for normal R&D projects (4 years for the initial term) and can be extended to a total of 7 years.
- Boundaries:** As the main objective is to ensure stable and long-term relations between participants, access of new participants is limited but possible (and has occurred already). Nevertheless, the boundaries seem to be rather set and the barriers to entry relatively high.
- Architecture and balance of power:** The establishment of the relations is a self-organised process, hence the centers are free to define their relations in a specific way.
- Stability and trust:** As the establishment of long-term relations is the main goal of the programme, stability and trust are main target variables.

2.5 Percieved and/or actual benefits

As the programme is only in its initial phase and results will take some time to materialize, the following describes only *expected* benefits:

Increased scale and scope of activities	Both are expected benefits
Shared costs and risks	Both
Improved ability to deal with complexity	Yes
Enhanced learning effects	One of the mayor goals
Positive welfare effect	No explicit goal, but might arise in some projects, given their nature
Flexibility and efficiency	Expected benefit
Speed	Not an explicit goal. Rather long-term, pre-competitive research is fostered.

2.6 Market / systemic failure the programme wants to address

The programme explicitly or implicitly addresses a number of potential market failures (uncertainty/risk, appropriability, information asymmetries, institutional failures). It's main focus though seems to lie on the institutional failures and the uncertainty/risk problem. The awareness problem is also addressed, but the information asymmetries are rather left to the ,bottom-up' process of network formation and organisation.

2.7 Potential future problems / problems already identified

- While the thorough process of screening, monitoring and selections of the projects is expected to result in the selection of ,high quality projects', it is also associated with some administrative burden.
- In the process of selection of proposals, the peer review approach has some limits.
- The reliance on the self-organisation capabilities of industry and academia could lead to unwarranted exclusion effects.

3 Case Study 2: The K_{ind}/K_{net} Programme

3.1 Background information on the programme⁹

The idea for the programme was born at the end of 1997, when the Minister for Economic Affairs announced the plan to install a programme fostering cooperation between enterprises and science institutions. The plan became effective with the Guideline of the Minister for Economic Affairs from May 1999. Selection of the centers/networks and funding started in the second half of 1999. Two different types of collaboration are distinguished: K_{ind} are competence centers, K_{net} are genuine networks.

So far, the following 7 networks/centers are operative or are about to start:

K _{ind} /K _{net} – Networks and Centers									
	Type	Status	Programme Funding		Total Project costs		Duration	Number of main partners*	Of which Enterprise
			[Mio AS] [MEURO]		[Mio AS]	[MEURO]			
Competence Center for Car Acoustics	K _{ind}	operative	75	5,5	133	9,7	1999-03	3	2
Competence Center for Mechatronic and Automation	K _{ind}	operative	64	4,7	117	8,5	1999-03	8	5
Competence Network: Energy from Bio-mass	K _{net}	operative	34	2,5	60	4,4	1999-03	5	3
New Media Competence Center	K _{ind}	Start phase	33	2,4	55	4,0	2000-04	5	4
Competence Center for interactive e-business	K _{ind}	Start phase	66	4,8	110	8,0	2000-04	10	5
EC3 Electronic Commerce Competence Center	K _{ind}	Start phase	56	4,1	93	6,8	2000-04	8	4
Competence Network on Aero-space Composite Materials	K _{net}	Start phase	90	6,5	150	10,9	2000-04	11	8
Total			418	30,5	718	52,3		50	31

* excluding associated SMEs

Source: Ministry for Economic and Labour Affairs (BMWA)

3.2 General features of the programme:

Focus: K_{ind} (industrial competence centers) supports the establishment of R&D centers jointly run by enterprises and research institutions (universities, government research labs etc), while K_{net} supports the cooperation of geographically dislocated/dispersed research facilities along common themes.

Target groups: all industrial enterprises with an own R&D department, research institutions. SMEs without own R&D might participate as ‚associated‘ partners at the level of individual projects. The center/network should

⁹ A general description of the programme is given at: <http://www.bmwa.gv.at/organisation/sekiv/aktiv/kindnet1.htm>.

have a transfer component, that is, technology transfer activities are encouraged. Planned technology transfer activities are a positive selection criterion.

Volume: Three centers are operative at the moment, for which 150 Mio AS (6,5 MEURO) have been provided in 1999 (total project costs 276 Mio AS / 20 MEURO). 4 centers are currently (2000) in a preparation phase, with the start of full fledged projects expected for 2001.

Duration: 1999-2002 (=period of initial funding; with projects expected to run until 2006). The funding period is limited to 4 years, with the possibility of a 3 years extension.

Institutional setting and organisation: The cooperation can take various forms, ranging from the more loose 'association' to the establishment of a formal RJV as a limited company.

Instruments used: Subsidies in the form of grants, up to 60% of total (eligible) project costs. Enterprises bear a minimum of 40% of the costs. Among 60% of public funding, a maximum of 40% can come from the Programme, the rest could be provided from other public (e.g. regional) sources.

3.3 Type and Focus of the programme:

The main objective of the programme is to lay the ground for the formation of industrial clusters by providing a durable framework for cooperation which should lead to the 'building of trust and a shared knowledge base' (See Table 1). 'Awareness activities' and 'search for partners' are no explicit activity of the programme. The programme has no active role in organising the network either, though it outlines some minimum formal requirements. Otherwise, the organisation is left to the participants. Neither does the Ministry take an active role as a partner in the center/network, although some regional governments do.

3.4 Characteristics of networks

Vertical and horizontal: So far, the networks have been mainly of a horizontal type, though vertical networks are not ruled out.

Geographic scope: Existing and planned centers/networks have a regional (Austrian provinces have a stake in some of the centers, others tend to have regional 'cores') and a national focus (mainly the networks, which have to have distributed research facilities). At the moment, there is no network with an international or global dimension, although this is not ruled out by the funding guidelines.

Organisational structure: Flexible, but different forms are prescribed by the programme. In reality, the majority of centers/networks take the form of a limited company, some work as looser 'associations'.

Duration: The duration is much longer than for normal R&D projects (4 years for the initial term) and can be extended to a total of 7 years.

Boundaries: Access to the center/network, once formed, is possible, but subject to the agreement of the existing network members. In cases of enlargement, the amount of funding available to the center/network can also be increased.

Architecture and balance of power: The establishment of the relations is a self-organised process, hence existing and planned centers/networks show a great variety of relations.

Stability and trust: As the establishment of industrial clusters is the main goal of the programme, stability and trust are main target variables. There is a barrier to entry which would prevent the numbers of participants becoming too large and there is a barrier to exit (sunk costs- which vary from participant to participant), thus it can be expected that numbers of participants will not fluctuate wildly. A problem – at least in the starting phase of the programme – has been to secure the stability of funding. Due to budget restrictions, the start of some – already selected - centers/networks had to be put on a hold until sufficient monies were again available. This might have injected some uncertainties among potential applicants.

3.5 Perceived and/or actual benefits

As the programme is only in its initial phase and results will take some time to materialize, the following describes only *expected* benefits:

Increased scale and scope of activities	Both are expected benefits
Shared costs and risks	Expected, but not specific to the programme
Improved ability to deal with complexity	Neither mayor goal nor mayor expected outcome
Enhanced learning effects	One of the mayor goals
Positive welfare effect	Expected through technology transfer activities
Flexibility and efficiency	Expected benefit
Speed	Expected benefit

3.6 Market / systemic failure the programme wants to address

Among the potential markt failures, the programme could address (uncertainty/risk, appropriability, information asymmetries, institutional failures), its main focus seems to lie on the institutional failures and it's main target is to provide a durable framework to build trust, while awareness and information asymetries are not addressed by the programme. Rather, the formation of the centers/networks is left to a ‚bottom-up‘ process.

3.7 Potential future problems / problems already identified

- Among programme managers, stability of finance on the side of the programme is seen as a crucial point (the programme virtually came to a halt in 2000, as the provision of public funds was unclær). Stop-and-Go finance decisions might be detrimental to the stability of the networks. Stability of finance and policy has also been shown to exercise a positive influence on the effects of public funding of private R&D (Guellec/van Pottelsberghe 2000).
- Another (potential) problem is seen in the pure bottom-up character of the process, which might run counter to a ‚SWOT-based technology policy‘.

4 Case Study 3: Export Cluster Formation

4.1 Background information on the programme

In late 1997 the government launched an initiative to improve the export performance of Austrian enterprises (Exportoffensive). Based on the findings of a study from Arthur D. Little (ADL 1997: ‚Exportoffensive - Projektmanagement zur Umsetzung des Massnahmenkataloges‘), a specific sub-programme for ‚export cluster‘ formation was established as part of this larger initiative. Although, the Programm is labeled as a ‚Cluster‘ programme, it is in the first place creating networks. Only in the medium to long-term it is expected that genuine clusters might emerge from sustained cooperation.

So far, the following 20 ‚export clusters‘ are operative or have been selected for funding:

‚Exports Clusters‘	Members	Period of support
Austrian Agricultural Cluster	13	1998 – 2000
Austrian Water Cluster	35	From 1998
Bioenergy Austria	44	From 1999
C-O-I – Cluster Object International – Hotel equipment	19	1999 – 2000
ICON – Industrial Construction Network	10	1998 – 2000
Food Cluster	10	1998 – 2000
Food Cluster South Austria	15	From 1998
Cluster “Austrian Environment” (Waste treatment)	25	From 1999
Airport Development Group	23	From 1999
AMEM Austrian Marine Equipment Manufacturers	20	From 1999
Austrian Building & Construction	14	From 1999
Centric	19	From 1999
Cluster Elektronik	4	1999- dissolved in 2000
EGA – Engineering Group Austria	10	2000
ENSO – Energienetwork South-East	26	From 1999
Export-Cluster ‚Vorarlberger Wood House‘	14	From 1999
IMC - International Medical Cluster	12	From 1999
Signatur	7	From 2000
Bio Concept	6	From 2000
ADWC – Austrian Danube Water Cooperation	11	From 2000
Almaco	20	From 2000
<i>Total:</i>	<i>21 (20 operative)</i>	<i>1998 - 2000</i>

Source: Wirtschaftskammer Österreich (WKÖ)

4.2 General features of the programme:

- Focus:** The programme attempts to help the formation of clusters of export-oriented enterprises. The support addresses both the organisation of the cluster (cluster management, information management), marketing activities (presentations at fairs, lobbying), market and feasibility studies, and the like.
- Target groups:** All exporting - or potentially exporting – Austrian enterprises, but special attention is paid to the participation of SMEs. In fact, some 85% of current participants are SMEs.
- Volume:** In total the ‚export offensive‘ has a volume of 332 Mio AS (24 MEURO), of which some 30 Mio AS (2,3 MEURO) accrue to the sub-programme for ‚cluster formation‘. Projects for ‚cluster formation‘ can receive funding up to 2,5 Mio AS (0,2 MEURO) for a period of two years, which can be exceptionally extended. Members are providing monies in the form of membership fees, which vary greatly between the clusters (and within one cluster often between larger and smaller enterprises).
- Duration:** The programme as a whole started 1998 and lasts until the end of 2000. Individual projects receive funding over a period of two years (a few have an extended life time of 3 years). After this initiation phase, the clusters are expected to carry on solely on the basis of their own funding.
- Institutional setting and organisation:** Monies are provided by the Ministry of Economic and Labour Affairs, the programme is organised by the Austrian Economic Chamber (WKÖ).
- Instruments used:** Subsidies in the form of grants are provided to finance the activities of the cluster (Cluster management, marketing activities etc.). Some complementary resources are provided in the form of free use of the network of foreign trade commissions of the WKÖ.

4.3 Type and Focus of the programme:

The main objective of the programme is to aid companies in entering new export markets. Time horizons are relatively short, i.e. commercial success in the near future is aimed at. The financial contribution of public funding is limited, but the angle of intervention is rather wide: both the ‚awareness of the network possibility‘, the ‚search for partners‘, ‚building trust and a shared knowledge base‘ and some input/help with regard to the ‚organisation of the network‘ are targeted. Most of these activities are covered by the cluster-manager. Some complementary resources are also provided in the form of support from the Aussenhandelsstellen (foreign trade commission) of the federal economic chamber (WKÖ). Only ‚active cooperation‘ is not covered, as neither the chamber nor the ministry are part of the cluster (see Table 1).

4.4 Characteristics of networks

Generally, the clusters fall into two different categories: Information & marketing platforms and ‚sales clusters‘. While the former focus on information exchange, information management and marketing activities, the latter act either as a ‚virtual system supplier‘ (e.g. for large-scale infrastructure facilities like airports) or as a consortium selling a specific product.

Vertical and horizontal: Cooperations can (and do) take both forms.

Geographic scope: Clusters predominantly emerge at the regional and national level, but their range of activities is global.

Organisational structure: Each network has to have a formal structure, but a multitude of organisational forms are possible (6 different forms are currently operative). The appropriate form depends on the type of activities the respective cluster focuses on. The clusters designed to provide primarily information exchange and act as a marketing platform, are mainly organised in looser forms (e.g. associations, working groups). Clusters acting as ‚virtual systems supplier‘ (e.g. for infrastructure) or focussing on direct sales activities are predominantly organised as limited companies (44%).

Duration: The funding period for the launch of the cluster is limited to 2 years.

Boundaries: There are boundaries as there has to be a formal membership (which involves payments of membership fees), but the network is rather open. Access can be granted subject to approval of the members (rules for access differ between the different organisational settings).

Architecture and balance of power: The establishment of the relations is a self-organised process, hence the networks are free to define their relations in a specific way. In practice, some clusters are undergoing considerable strain to come to an adequate ‚balance of power‘.

Stability and trust: In this kind of network stability and trust are always challenged by diverging (short-term) interests of firms. This is especially to be seen in clusters with a larger number of members, a high share of SMEs and a large number of competitors trying to cooperate. In some cases, it took long to establish trust relations, in others this process has not been completed yet. Some of the clusters might even disintegrate. Thus the task for the Cluster manager is extremely delicate. As recent experience with the conduct and performance of the various clusters has shown, the Cluster manager has a great role as a 'go-between'. Success of the cluster hinges mainly on his/her performance in this role.

4.5 Perceived and/or actual benefits

As the programme is only in its initial phase and results will take some time to materialize, the following describes the *expected* benefits from the side of the programme administrators:

Increased scale and scope of activities	Not necessarily in the form of new products/processes, but in the form of accessing new markets
Shared costs and risks	Both
Improved ability to deal with complexity	Expected benefit, once the networks have become stable
Enhanced learning effects	No explicit goal, but likely as a by-product of cooperation
Positive welfare effect	No explicit goal, direct effects for the firms are the main target. Might arise in some projects.
Flexibility and efficiency	Among the expected benefits (in the form of quick reaction to new market opportunities)
Speed	See above

A monitoring study looking into the performance of the programme and the participants (Janger/Schleicher 2000) found that the clusters were very much geared towards 'information exchange' and 'project acquisition', which were seen to be the main benefits from the participation (27,5% and 23,8% respectively). Only for a small minority of firms joint R&D, impulses for product development or joint training were motives to participate (7,2% / 8,4% / 4,8%) and actual benefits (2,5% / 2,5% / 0%). This is not surprising given the orientation of the programme and the short time period elapsed since most of the clusters were founded. Nevertheless, it could be expected, that these dimensions of cooperation will be enforced in those clusters that emerge as stable configurations. 'Cooperation with other enterprises' improved for 63% of the participants – despite some manifest problems in some clusters.

4.6 Market / systemic failure the programme wants to address

The programme tries to address a number of potential market failures, but predominantly those that arise from information failures/asymmetries/deficiencies and institutional failures. Information deficiencies include those about potential cooperation partners as well as those about foreign markets. SMEs are especially prone to confront these types of market failure.

4.7 Potential future problems / problems already identified

- The programmes main focus is to initiate cooperation and to encourage joint use and provision of these services, thereby creating trust among members. As the number of participants in the networks can be large, the building of such trust relations is very often difficult and time consuming. Some clusters might even fall apart again before real take-off because of the diverging interests of partners.

- The programme had fixed ceilings for funding and duration for each cluster, irrespective of the great heterogeneity which could be found between them. A more flexible approach to duration and funding could have been beneficiary for some of the clusters, especially for those dealing with complex products and/or a large number of participants.
- The programme also was hit by some budgetary constraints. Stable provision of funding would help to enter stable relations or to establish such relations earlier.
- For some clusters, the possibility of longer funding or a follow-up funding would have positive effects on the sustainability of the clusters. As of today, no such extension of the programme is envisaged.

5 Networking Policy in Austria - Summary and conclusions

Policies addressing networking and cluster formation have received increased attention in recent Austrian technology and innovation policy. The aforementioned programmes are good examples for these initiatives (which cover also cluster formation e.g. at the regional level). Also in terms of funding, the monies provided for these type of policies have increased in recent years.

Two of the programmes address a specific weakness of the Austrian Innovation system, namely the perceived lack of cooperation between the science system (including universities and public research facilities) and the enterprise sector. The third initiative addresses another weakness, namely the export performance of SMEs.

The programmes share some characteristics:

- They do not 'pre-select' areas, fields of technology or branches. The definition of the topics is left to a 'bottom-up' process.
- They do encourage or demand some form of formal organisational structure, though the participants have a choice in which form they might see as most appropriate. Thus, they have minimum formal requirements, but also have some flexibility.
- The design of the internal relations of the networks are left to the participants.

The differences between the programmes are mainly to be found in:

- The more long-term perspective of **Kplus** and K_{ind}/K_{net} in comparison to the 'export cluster' programme. This difference is also reflected in the duration of funding.
- The apparently greater difficulties of network formation in the 'export cluster' programme. This should not come as a surprise, as these networks on average involve greater number of partners and are more market-oriented and less pre-competitive than the two other programmes. For a large number of competing SMEs it seems natural to have more difficulties in establishing relations of trust.

The **Kplus** programme also has introduced a formalised competitive process for the distribution of funds, which is a novel feature for Austrian technology and innovation programmes.

The overall effect of the programmes on the Austrian Innovation System cannot be identified at the moment. The programmes started only a few years ago and judgement will have to wait at least until the first round of intermediary evaluations. Given the nature of the programmes, most of the real impact will only emerge some years after completion (e.g. sustained network, development into full-fledged clusters, commercialisation of pre-competitive research projects etc.)

At present, it can be said that the programmes seem to have tackled important weaknesses of the Austrian Innovation System, they have introduced novel ways of programme design and conduct. Also, the programmes seem to attract a rather wide spectre of participants and indeed seem to have triggered cooperations or established a new quality of cooperations.

What could turn out to be a problem is the lack of coordination between the different instruments of technology and innovation policy. This problem is one of coordination and complementarity (a) between the aforementioned programmes (especially between **Kplus** and K_{ind}/K_{net}), (b) between these programmes and other cluster/network oriented policies e.g. on the regional level, and (c) between cluster/network oriented policies and other types of technology policy. Austrian technology policy has yet to solve this puzzle.

6 ANNEX

Table 1: Type and Focus of the Programmes

Type of the programme	Targeting Science-Industry linkages		Adressing export-oriented networks of enterprises
	Kplus	K _{ind} /K _{net}	Export Cluster
Focus of the programme			
Awareness of the network possibility	X		X
Search for partners			X
Building trust and a shared knowledge base	X	X	X
Organising the network			
Ensuring provision of complementary resources	(X)		(X)
Active cooperation		(X)	

(X)...partly / indirectly addressed

Table 2: Programme funding in comparison

	1998 [in Mio AS / MEURO]	1999 [in Mio AS / MEURO]	2000** [in Mio AS / MEURO]
Grants from Kplus*		60 / 4,35	120 / 8,7
Total volume of Kplus projects		300 / 21,8	400 / 29
Grants from K _{ind} /K _{net} *		149 / 10,8	14 / 1,0
Total volume of K _{ind} /K _{net} projects		276 / 20,1	35 / 2,6
Grants from Export cluster initiative*	2,8 / 0,2	13,6 / 1,0	17,6 / 1,3
Total		798,6 / 58,0	586,6 / 42,6

* as other expenditures than R&D are also funded, the total sum of the grant is not equivalent to R&D expenditure.

** preliminary figures

Sources: BMWA, WKÖ, TIG