

INNO-Policy TrendChart - Policy Trends and Appraisal Report

TURKEY

2007

Innovation is a priority of all Member States and of the European Commission. Throughout Europe, hundreds of policy measures and support schemes aimed at innovation have been implemented or are under preparation. The diversity of these measures and schemes reflects the diversity of the framework conditions, cultural preferences and political priorities in the Member States.

PRO INNO Europe is a new initiative of Directorate General Enterprise and Industry which aims to become the focal point for innovation policy analysis, learning and development in Europe, with the view to learning from the best and contributing to the development of new and better innovation policies in Europe. Run by the Innovation Policy Directorate of DG Enterprise and Industry, it pursues the collection, regular updating and analysis of information on innovation policies at national and European level.

The **INNO-Policy TrendChart** serves the “open policy coordination approach” laid down by the Lisbon Council in March 2000. It supports organisation and scheme managers in Europe with summarised and concise information and statistics on innovation policies, performances and trends in the European Union (EU). It is also a European forum for benchmarking and the exchange of good practices in the area of innovation policy.

The INNO-Policy TrendChart products

The INNO-Policy TrendChart, previously TrendChart on Innovation, has been running since January 2000. It now tracks innovation policy developments in all 27 EU Member States, plus Iceland, Norway, Switzerland, Croatia, Turkey, Israel, Brazil, Canada, China, Japan, USA and India. The INNO-Policy TrendChart website¹ provides access to the following services and publications, as they become available:

- a database of innovation policy measures across 39 countries;
- a news service and related innovation policy information database;
- a “who’s who” of agencies and government departments involved in innovation;
- annual policy monitoring reports for all countries covered;
- an annual synthesis report bringing together key points in the INNO-Policy TrendChart.

The present report was prepared by Sirin Elci (sirin.elci@technopolis-group.com). The contents and views expressed in this report do not necessarily reflect the opinions or policies of the Member States or the European Commission.

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¹ See <http://www.proinno-europe.eu/index.cfm?fuseaction=page.display&topicID=52&parentID=52>

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Executive Summary

1. Introduction: innovation performance and policy objectives

For years, unfavourable macroeconomic conditions characterised by high long-term inflation, high interest rates and repetitive crises have been significant disincentives for innovation in Turkey. However, since the fourth quarter of 2003, Turkey has experienced a recovery favouring the transition to a more stable economy after the crises in 2001. Gross Domestic Products (GDP) growth in 2006 was 6.1 percent as opposed to -7.50 percent in 2001. With a rate of 9.3 percent in 2006, inflation remained in single digits despite the depreciation of the Turkish lira in the wake of the financial turmoil in May 2006 (at the lowest level for almost the last 30 years). There are also improvements observed in other indicators, such as the labour productivity, unemployment rate and the level of Foreign Direct Investment (FDI).

According to the European Innovation Scoreboard (EIS) 2006, Turkey is one of the lowest-ranking countries in most of the indicators. However, the very poor availability of data prevents the generation of a reliable summary innovation index of the EIS and the identification of trends. In general, positive trends are observed in all innovation drivers indicators and in public R&D. Business R&D expenditures and the available indicators in 'innovation and entrepreneurship' and 'application' categories show declines, while trend results suggest improvements in intellectual property.

Since 2005, innovation continues to be a hot topic for discussion in Turkey and innovation policy is now driven by a broader public awareness. Civil initiatives in this respect play an important role and were mainly triggered by the TrendChart products of previous years. They helped initiate a debate in political circles as well, and were informed the decisions of the Supreme Council of Science and Technology (BTYK) in March 2006 regarding the collection of the innovation related statistics², and in September 2006 on the design of national innovation strategies with the involvement of all stakeholders.

The main objectives of the science and technology strategy of Turkey are to increase (a) the demand for R&D, (b) the number and quality of scientists, and vocational and technical staff, and (c) the Gross Domestic Expenditures in R&D (GERD) as a percentage of GDP. In line with these objectives, the main targets for 2010 are to increase the share of GERD/GDP to two percent (from 0.66 percent in 2002) (half of this amount is to be funded by the private sector), and the number of full-time equivalent R&D personnel to 40,000 (from 28,964 in 2002). It is also intended to increase the number of vocational and technical staff proportionally.

2. Major innovation challenges and policy responses

The main challenges for Turkey are identified on the basis of the fact that the country needs to focus on input innovation drivers and knowledge creation to be able to increase the innovation performance of the private sector.

Challenge 1: Increasing investments in human resources for innovation

Turkey needs a further increase in the quantity and quality of tertiary level education to develop human resources for innovation. In spite of the increase in tertiary education enrolment rates in recent years (from 13 percent in 1990-91 to 25 percent in 2002-03) Turkey still ranks last out of the countries covered by the EIS. Recognising this challenge, the government has taken steps to improve the education system (for example, by integrating innovation in the national curricula for compulsory school education (requiring each pupil to attend school for at least eight years), by designing a new measure to support masters and doctorate theses prepared by university students in line with the needs of the industry) and by deciding to establish 32 new state universities. Further steps are

² <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.informations&page=detail&id=1523>

needed, particularly at the tertiary level to upgrade the curricula according to the needs of the business community.

Challenge 2: Enhancing university-industry co-operation

Establishing strong linkages between the private sector and the research community is critical for Turkey as most R&D is performed by universities (universities account for 58.9 percent of the country's R&D expenditure, employ 73.2 percent of researchers and produce a high level of scientific output which is not transformed into innovation). The government addresses this challenge with two on-going measures ('Establishment of Technology Development Centres (TEKMERS)' (TR 03) and 'Support for the establishment of technology parks (the Law on Technology Development Zones)' (TR 18)). Over the last one year, three more measures that address this challenge have been introduced (Industrial Thesis (San-Tez) Projects (TR 32), Joint Technology Development Projects (TR 34), Scientific and Technological Cooperation Networks and Platforms Support Programme (ISBAP) (TR 38)). There is a need to increase the number and quality of intermediaries to improve communication and co-operation between the private sector and academia; to revise university regulations and legislation to encourage collaboration; and to provide incentives to raise the demand from industry.

Challenge 3: Increasing early stage funding

The underdeveloped venture capital and business angels market is a crucial impediment for the creation and development of innovative businesses in Turkey. Only a few of the existing investors prefer to invest in small and medium companies and almost none of them chose to make early stage investments. Similarly, business angel investments are low and the lack of business angels networks prevents entrepreneurs' access to such finance options. Four new measures were launched over the past year to address this challenge (Pre-Incubation Support Programme (TR 39), Start-up Support (TR 41), Risk Sharing Facility Support (TR 42), Support Programme for Technology- and Innovation-focused Entrepreneurship (TR 43)). Moreover, the European Investment Fund, together with the local actors like KOSGEB and TIGVA, aims to create a fund of funds programme for Turkey. Further actions are needed to improve the framework conditions which are crucial to develop the Turkish venture capital industry.

Innovation challenges, policy responses and impact

Challenge	Relevance of policy response (1-5)	Evidence of impact (1-5)
Increasing investments in human resources for innovation	2	3
Enhancing university-industry co-operation	3	3
Increasing innovation activities of the private sector	3	3

Policy response ranking scored from 1 to 5: (1) No specific measures addressing the challenge (possibly a debate but no evidence of any real policy development); (2) Policy development under way to respond to challenge (policy debate or design launched, e.g. announced in National Lisbon Reform Plan, etc.); (3) Specific measures existing for some time but insufficient to respond fully to challenge; (4) Existing measure plus one or more newly launched measures (during last 18 months); (5) A comprehensive set of measures which potentially responds fully to the challenge

Evidence of impact scored from 1 to 5: (1) Trend for indicators has worsened since measure(s) introduced; (2) No observable change in trend since measure(s) introduced; (3) Too early to appraise (measures introduced in last 24 months); (4) Trend for indicators has improved since measure(s) introduced; (5) Evaluation or study indicates measure(s) has clearly contributed to improving performance of country.

3. Innovation governance and policy trends

3.1 Innovation governance: key changes and issues

Turkey has a long tradition of science and technology policy making dating back to the 1960s. Especially after 1996 almost all stakeholders have been involved in science, technology and innovation policy-making. On the other hand, due to a lack of a shared vision and insufficient commitment by stakeholders to the implementation of policies, the main goal, i.e. *establishing a fully functioning national innovation system (NIS)*, has not been achieved completely yet.

The Vision 2023 Project, which intended to eliminate these problems, was completed at the end of 2004 and the new science and technology strategies were prepared, involving the largest stakeholders. This new policy making process also showed an increased political commitment and a more evidence-based approach. A new national innovation strategy (2008-2010) prepared by TUBITAK was issued in March 2007.

Monitoring and evaluation practices of innovation measures started in 1998 as a requirement of the World Bank funded Industrial Technology Project (ITP). However, they only apply to a small proportion of innovation schemes and most of the measures are not monitored or evaluated.

Important action still needs to be taken to ensure the successful functioning of the system. The most important remaining weaknesses are the lack of a systemic view of innovation in policy making and implementation where innovation is not primarily a result of a science and R&D push; insufficient monitoring and evaluation of most measures (systematically involving external experts, taking an evidence-based approach, referring to quality appraisals of evaluation reports, making results available for public debate, etc.); and the lack of the regional approach to innovation policy making.

3.2 Trends in innovation policies

Over the last 12 months 13 new policy measures were introduced. The new measures mainly aim at strengthening the links between research community and the private sector (TR 32, TR 34 and TR 38) and encouraging the creation of high-tech start-ups (TR 39, TR 41, 42 and TR 43). Three new measures (TR 35, TR 36 and TR 37) aim to contribute to sustainable development through eco-innovation. Another measure (TR 44) specifically addresses the weakness of patent application levels in Turkey by funding patenting costs. Two measures (TR 33 and TR 40) aim at financing innovation and strengthening research carried out by companies.

With the addition of the new measures, a higher portion of funds allocated from the state budget were reserved for industrial R&D and innovation compared to the past years where the majority of funds were utilised for research (approximately €210 million allocated for industrial R&D and innovation in 2007 as opposed to €132 million in 2005 for example).

4. Conclusion: future actions and opportunities for policy learning

The increased commitment of the government to science, technology and innovation and the recent improvement of macroeconomic conditions and political stability have given a new initial impetus to Turkish innovation policy. However, it is required to increase the number and diversity of innovation measures and focus the policy mix strategically on priorities in order to increase innovation performance. There are also weaknesses to be removed in innovation governance.

In doing that, it is important to learn from lessons and good practice cases identified in other countries. In particular, policy measures successfully encouraging commercialisation of research results and stimulating the innovation activities of the private sector could be used to inspire the development of similar initiatives in Turkey.

The current TrendChart measures that might inspire Turkish policy makers and implementing actors include the British Higher Education Innovation Fund (HEIF, UK 38, see [PRO INNO Europe website](#) for more details) and the Small Business Research Initiative in the (UK 46, see [PRO INNO Europe website](#) for more details); the TULI Programme (FI 6, see [PRO INNO Europe website](#) for more details) in Finland and YOZMA in Israel (IL 03, see [PRO INNO Europe website](#) for more details).

1. The Innovation System and its Governance

1.1 The National Innovation System

The main actors in the national innovation system (NIS) of Turkey are the government bodies, business enterprises and federations, universities, and other important players such as contract research centres, technology parks, incubators and private providers of funding. As seen in Exhibit 1 below, the Turkish innovation system comprises almost all important elements. However, considering the size of the country, they are not sufficient either in number or in terms of the scale of operation. More importantly, the intensity and quality of linkages and co-operation between specific components (enterprise sector, universities, public bodies, etc.) are weak. This prevents Turkey from reaching its ambitious goal of 'establishing a well-functioning national innovation system with all institutions'.

Exhibit 1: Selected key organisations within the National Innovation System

Type of organisation	Name of organisation (in English)	Website (where available)
<i>Government and legislative bodies</i>		
Government body	Supreme Council of Science and Technology	
Public	Scientific and Research Council of Turkey	www.tubitak.gov.tr
Public	State Planning Organisation	www.dpt.gov.tr
Public	Under-Secretariat of Treasury	www.treasury.gov.tr
Public	Under-Secretariat of Foreign Trade	www.dtm.gov.tr
Public	Ministry of Industry and Trade	www.sanayi.gov.tr
Public	Ministry of Finance	www.maliye.gov.tr
Public	Ministry of National Education	www.meb.gov.tr
<i>Private sector organisations and entrepreneurship promotion</i>		
Public	KOSGEB's Entrepreneurship Development Centre	
Public and private	Technoparks and TEKMERs	
<i>Knowledge institutes (R&D and education bodies)</i>		
Public and private	Universities	www.yok.gov.tr
Public and private	University Research Centres	
Public	Public Research Institutes	
<i>Industrial research centres and innovation intermediaries</i>		
Public	Marmara Research Centre of TUBITAK	www.mam.gov.tr
Public	University-industry joint research centres	
<i>Financial system</i>		
Public	Technology and Innovation Support Programmes Directorate of TUBITAK	www.teydeb.tubitak.gov.tr
Public	Small and Medium Industry Development Organisation	www.kosgeb.gov.tr
Not-for-profit foundation	Technology Development Foundation of Turkey	www.ttgq.org.tr
Private	Venture capital companies and private equity funds	

Government and legislative bodies: Turkey has relatively well structured government institutions in the NIS at national level. The most important shortcoming of the system is that there are no regional bodies for policy making and implementation.

The Supreme Council of Science and Technology (BTYK) is the highest-level policy co-ordination body for science, technology and innovation in Turkey. It is chaired by the Prime Minister and is composed of the related ministries, high level representatives of the government bodies, universities

and NGOs. The Scientific and Technological Research Council (TUBITAK), which reports to the Prime Minister, is responsible for the design of science and technology policy. TUBITAK acts as secretary to the BTYK. The State Planning Organisation (DPT) is responsible for the design and implementation of the Five-Year Development Plans and other innovation-related policies and programmes, such as the 'e-Transformation Turkey' project, and is thus another important actor of the NIS.

The providers of public funds for innovation (the Under-Secretariat of the Treasury (HM) and the Under-Secretariat of Foreign Trade (DTM)), coordinators of policy implementation (Ministries of Industry and Trade (MoIT), Finance (MoF) and National Education (MoNE) and the Council of Higher Education (YOK)) are also major players at government level. Another component of the NIS is the Turkish Academy of Science (TUBA) affiliated to the Prime Minister's office. It is mainly in charge of co-operation with academia and the support of academic research. The Turkish Patent Institute (TPE), the National Metrology Institute (UME), the Turkish Accreditation Agency (TURKAK) and the Turkish Standards Institute (TSE) affiliated to the MoIT are the other public organisations of the NIS. The Competition Authority, the Telecommunications Authority and the Electricity Market Regulatory Authority are the most important regulatory bodies within the Turkish innovation system. Another actor is the Turkish Statistical Institute (TURKSTAT) which is responsible for providing statistical information related to R&D, innovation and industry, among others.

Private sector organisations and promotion of entrepreneurship: Private sector organisations are a significant component of the national innovation system of Turkey. According to the provisional results of the '2002 General Census of Industry and Business Establishments' conducted by TURKSTAT, there are 1,720,598 enterprises, 14.35 percent of which are companies of the manufacturing industry. The industrial sector is dynamic and export-oriented, as underlined in the report 'Industrial Policy for Turkey: Towards EU Membership'³. However, investment in R&D and innovation by the private sector is unsatisfactory (see Section 2.1.1).

The Entrepreneurship Development Centre of the Small and Medium Size Industry Development Organisation (KOSGEB) and the Entrepreneurship Development Centres established under the South-East Anatolia Project (GAP-GIDEMs) are the most important organisations promoting entrepreneurship. The technology parks and incubators are also important in this respect. There are 20 techno-parks in the country, established by universities and research centres. KOSGEB runs 16 incubators (called as Technology Development Centres, or TEKMER) (TR 03) in co-operation with technical universities and industrial chambers. Both techno-parks and TEKMERs help closing the gap between the business sector and research community. There are also private incubators such as the Ericsson Mobility World and the Siemens Business Accelerator.

There are not enough business networks and formal clustering activities except for some pilot projects. The 'sectoral foreign trade companies', established by DTM, which form networks of SMEs, and the facilities for common use of the private sector founded by KOSGEB with regional umbrella organisations (ORTKAs and ORTLABs) (TR 16) are the most significant establishments for this purpose.

Knowledge institutes (R&D and education bodies): Universities are the main institutions providing key knowledge and skills for innovation. There are 77 universities in Turkey, which together account for 64.3 percent of Turkey's total R&D spending. 53 of these are public and the rest are private. Three-quarters of universities have technical faculties and research centres that also provide R&D and innovation-related services to the industry. Two thirds (67 percent) of universities provide management programmes and courses. There are 1492 faculties, institutes, higher schools and vocational higher schools in the country. Lifelong Learning Centres, which mainly belong to regional universities all over the country, provide short-term training and certificate programmes for the participants from the business sector.

Major universities have established centres to create and disseminate knowledge. Among them are the Competitiveness Forum of Sabanci University and Turkish Industrialists' and Businessmen's Association (TUSIAD), which also coordinates the National Innovation Initiative (see Section 2.2.1),

³ DPT, Industrial Policy for Turkey (Towards EU Membership) (2003), <http://ekutup.dpt.gov.tr/sanayi/tr2003ab.pdf>

and the Research Centre for Science and Technology Policies of the Middle East Technical University.

There are more than 100 public research institutes, most of which are not very active in establishing linkages with the business sector: only about one dozen centres carry out industrial R&D.

EU-Turkey Business Development Centres located in three regions of the country as well as 25 regional offices of KOSGEB provide training and consultancy to SMEs. There are a large number of public, private and non-governmental organisations providing consultancy and training on innovation-related matters.

Industrial research centres and innovation intermediaries: TUBITAK's Marmara Research Centre (MAM) is the largest and the most active contract research centre which also runs a techno-park for high-tech enterprises. TUBITAK has five more R&D institutes that are active in information technologies and electronics, defence industries, cryptology, agro-technology and genetic research.

Co-operation between the business and research communities is weak in Turkey. As highlighted in the Country Economic Memorandum published by the World Bank⁴, the main factors hindering research-industry collaboration are

- limited communication between research institutions and firms due to the limited availability of intermediaries (such as technology transfer offices, technology parks, and university-industry technology centres) facilitating exchanges between the industry and research communities,
- a lack of incentives to stimulate collaboration between universities and enterprises,
- companies perceive the quality of Turkish scientific institutions as quite low, which limits their interest in collaborating with local researchers,
- cultural differences.

University-Industry Joint Research Centres are the major institutions which help development of a climate conducive to co-operation.

Private, semi-public and non-governmental organisations have become increasingly important bridging institutions between the private and public sectors and academia and act as a voice for the private sector. As the umbrella organisation of the business federations, the Union of Chambers and Commodity Exchanges of Turkey (TOBB) plays an important role in the national innovation system. TOBB acts as the hub of a network formed by most of the non-governmental organisations and industrial chambers. Chambers of Industry located throughout Turkey mainly provide and disseminate information to their members. However, only a few of them are very active in innovation matters.

Financial system: The main institutions financing innovation in the private sector include the Technology and Innovation Support Programmes Directorate of TUBITAK (TUBITAK-TEYDEB), the Small and Medium Size Industry Development Organisation (KOSGEB) and the Technology Development Foundation of Turkey (TTGV). TUBITAK and DPT also provide finance for research activities in universities and research institutes. All of those institutions make special efforts to act as intermediaries between the government level and the industry. They also promote establishment of linkages between the business and research communities on innovation.

The Capital Market Board (SPK) is responsible for the development and implementation of the regulations for venture capital and private equity, among others. Such financing mechanisms are under-developed in Turkey. There are only a few companies making private equity/venture capital investments with limited amount of funds, and there are no business angels networks or intermediary organisation for matchmaking purposes.

Moreover, the mechanisms and institutions supporting the commercialisation of research results and the start-up of innovative businesses are also insufficient. Halkbank is the major bank providing credits to SMEs and entrepreneurs. Other relevant financial institutions include Turk Eximbank, the

⁴ World Bank, Turkey: Country Economic Memorandum (2006) Promoting Sustained Growth and Convergence with the European Union (http://siteresources.worldbank.org/INTTURKEY/Resources/361616-1141290311420/CEM2006_v2_Main.pdf)

Development Bank of Turkey and the Industrial Development Bank of Turkey. The Credit Guarantee Fund (KfW), which was established in partnership with related institutions including KOSGEB, TOBB and Halkbank, provides guarantees for SME loans to facilitate risk-sharing and lending activities of Turkish banks.

To conclude, the main strength of the Turkish innovation system is the existence and diversity of main players. Though not very R&D and innovation-oriented, the existence of a dynamic and export-oriented private sector; active semi-public and non-governmental organisations acting as an intermediary between the public and the private sectors, widespread knowledge institutes and the existence of an entrepreneurial culture can also be considered as particular strengths of the system. However, there are major weaknesses which cause problems in the functioning of the NIS and result in an unsatisfactory innovation performance. As underlined above, the most important weakness is the lack of an effective and systematic network and of lines of communication between the players. This is mainly caused by the fact that the actors of the NIS are not open to cooperation, mainly for cultural reasons. With respect to the flows in the NIS⁵, there are no effective mechanisms facilitating human resources and knowledge flows between universities, firms and research centres. In addition, regulation flows from government agencies to innovation organisations and financial flows from the government to the private sector are insufficient. The lack of regional and sectoral approaches in innovation policy making and implementation, the insufficient number and diversity of financial institutions for innovation and the small number of financial and innovation intermediaries are the most important shortcomings of the system.

1.1.1 Tracing the evolution in the governance system

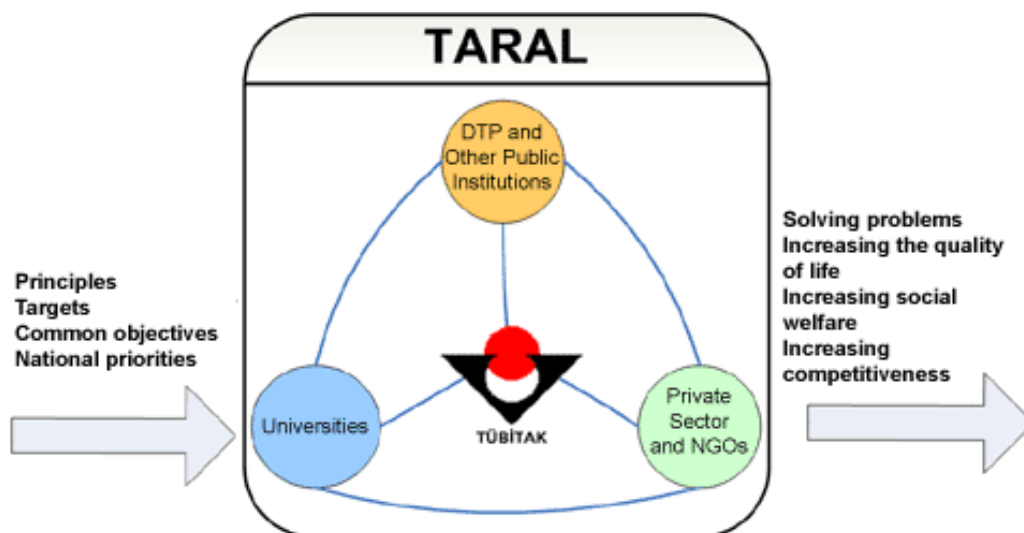
Since the beginning of 2000, there is an effort by the BTYK to improve the science, technology and innovation governance system in Turkey. The first important step taken in this respect is the Vision 2023 Project have been implemented between 2002 and 2004 to achieve the widest participation possible with increased commitment around a shared vision for the formulation of science, technology and innovation strategies for the next two decades.

In light of the results of the Vision 2023 project, the BTYK took important decisions in its meetings in September 2004 and March 2005: At the September meeting, the BTYK defined the “Turkish Research Area” (TARAL) where the private and public sectors and non-governmental organisations strategically focus and collaborate on R&D. TUBITAK has been assigned as the organisation responsible for the effective functioning of TARAL. Integration of TARAL with the European Research Area (ERA) has also been one of the main tasks of TUBITAK.

At its March meeting, the BTYK approved the five-year implementation plan of the science and technology strategies which was designed by TUBITAK in consultation with the stakeholders as an output of the Vision 2023 project. BTYK also ratified the new priority technology fields; projects to be prioritised in R&D support of TUBITAK; the framework for the performance measurement system to be used for evaluating the national science and technology system (with a selection of indicators defined in light of the ones used by the OECD, EIS, World Economic Forum and World Bank), among others.

⁵ A NIS is dynamic due to the “financial flows between government and private organisations...human flows between universities, firms, and government laboratories, regulation flows emanating from government agencies towards innovation organisations and knowledge flows (spillovers) among these institutions” (Niosi, 2002).

TARAL as defined by the BTYK



Source: TUBITAK

In order to follow-up and coordinate policy implementation, in 2006, TUBITAK conducted face-to-face interviews among the TARAL actors. Over 120 institutions were visited by 40 TUBITAK staff. As noted in the BTYK resolutions of March 2006⁶, the interviews as a process helped raising awareness among TARAL actors and TUBITAK expects that the survey results would provide valuable input for the next steps of policy implementation.

In March 2007, the BTYK approved the “National Innovation Strategy” prepared by TUBITAK for the years 2008-2010. TUBITAK is responsible for the follow-up and coordination of the strategy.

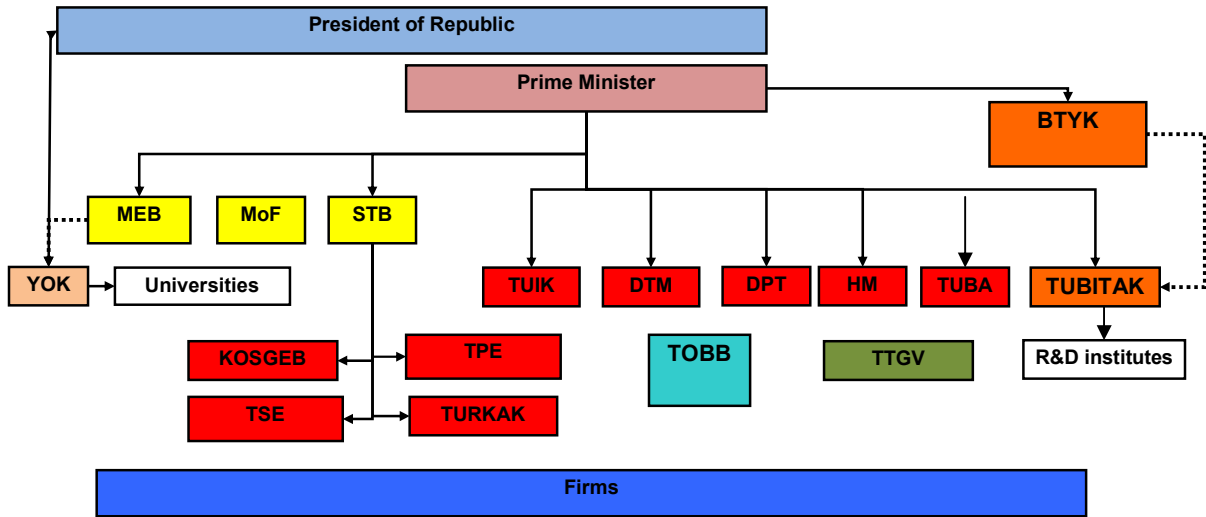
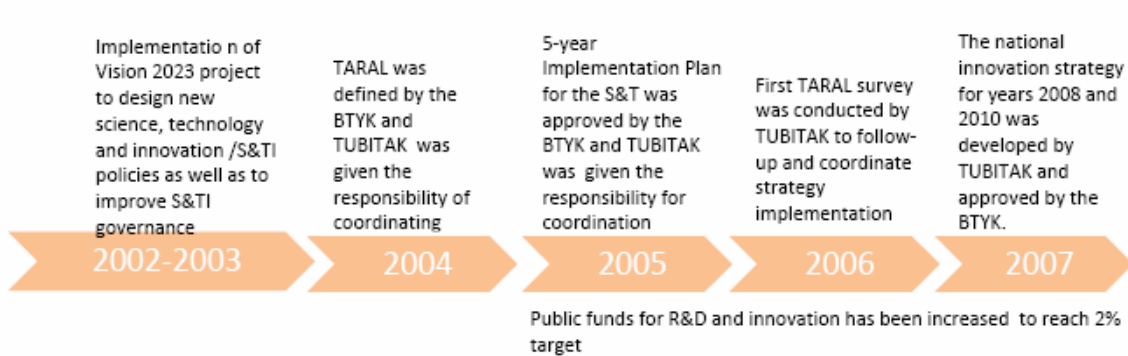
In terms of the resources, the present Government started to take steps in increasing the R&D expenditures since the beginning of 2005. In line with the objective of the BTYK to increase R&D spending to 2 percent of the GDP in 2010, the Government allocated EUR 247 million⁷ to be spent for R&D in 2005 under the coordination of TUBITAK. The total amount was considered to be the highest level of money allocated for R&D by the Government in one year. TUBITAK designed new schemes and revised existing measures for the use of allocated money. Similar level of funds has been allocated in 2006 and 2007. The total amount of funds put aside for new and ongoing R&D programmes for the last three years is €2.2 billion while it was €1 billion during the period of 2000-2004.

To summarise, from organisational perspective, there are no changes in the main governance system in Turkey over the past seven years. The main actors continue to be the BYTK and TUBITAK. There is not any major shift in the responsibilities for governance as well. The BTYK has the main coordination responsibility while it assigns TUBITAK as the body responsible for the coordination of strategies. The responsibilities of other organisations implementing the innovation policy measures remain the same. The only notable shift is the remarkable increase in the resources allocated to TUBITAK as highlighted above.

⁶ 13th Meeting of the Supreme Council of Science and Technology-Evaluation of Progress and Decisions, 8 March 2006

⁷ 1 EUR=1.8 TRY

Exhibit 2: Organisational Chart tracing evolution lines of the national Innovation Governance System



BTK- Supreme Council of Science and Technology
 MoF- Ministry of Finance
 STB- Minister of Industry and Trade
 MEB- Ministry of National Education
 HM- Undersecretariat of Treasury
 DPT- State Planning Organisation
 TÜBİTAK- The Scientific and Technological Research Council of Turkey
 YÖK- Higher Education Council (YÖK)
 TÜBA- The Turkish Academy of Sciences (TÜBA)
 TURKAK- Accreditation Board

TPE- Turkish Patent Institute
 TSE- Turkish Standards Institute
 TÜİK- The Turkish Statistic Institute
 DTM- Undersecretariat of the Prime Minister for Foreign Trade
 TOBB- Union of Chambers and Commodity Exchange of Turkey
 KOSGEB- Small and Medium Industry Development Organisations
 TTGV- Technology Development Foundation of Turkey

1.2 Appraisal of the National Governance System

1.2.1 Policy Making and Evaluation Practices

The main strengths of the Turkish innovation policy are its long tradition of science and technology policy making (dating back to 1960s) and the well-developed institutional framework (see section 1.1 and Annex 1).

Policy making practices in Turkey have changed over time. At the beginning, science and technology policies were formulated by TUBITAK in a tacit consensus with the government. Then, starting from early 1980s a participatory approach was followed and in mid-1990s all relevant stakeholders from the private and public sectors, academia and non-governmental organisations were involved in the policy making process. On the other hand, due to lack of a shared vision and commitment by all stakeholders for implementation of policies, the main goal of “*establishing a fully functioning national innovation system*” which was set in late 1990s, has not been followed up entirely. Another obvious reason for failure is the low levels of co-operation, communication and co-ordination among all actors in the innovation governance system. The Vision 2023 Project that has been implemented to eliminate these problems was completed by the end of 2004, and the new science and technology strategies were prepared by the involvement of the largest stakeholders. This new policy making process is also characterised by increased political commitment and being evidence based.

In September 2006, the BTYK took the decision of designing the national innovation strategies with the involvement of all stakeholders. On the other hand, in March 2007, the national innovation strategies (2008-2010) prepared by TUBITAK was announced.

In order to increase the quality of the decision-making process for policy design, the BTYK took a decision in March 2006 to collect innovation related statistics, which would also be an input to the EIS. The TUIK started to take steps to review and revise, if necessary, the methodologies used in collecting statistics.

Particularly in 1990s and early 2000s, the design of innovation policy measures has been carried out by the implementing agencies (TUBITAK-TEYDEB, TTGV and KOSGEB) in consultation with national and/or international external experts. Opinions of the target groups (the business sector, entrepreneurs, SMEs, etc.) have been also sought through various means like focus groups and questionnaires. During the last few years, little emphasis has been put on the process of stakeholder consultation in policy measure design. Recent measures are mostly designed by officials of the implementing agencies. Moreover, there is no clear separation between policy design and policy implementation, and the implementing agencies of policy measures are actively involved in the policy-making process.

The lack of a systematic approach to monitoring and evaluating innovation programmes is a significant weakness of the Turkish governance system. The only programmes evaluated according to good practice criteria (i.e. to systematically involve external experts, make evidence-based assessments, use quality appraisals of evaluation reports, make results public for debate, etc.) are those financed by the World Bank under the Industrial Technology Project (ITP). This corresponds to only four measures which were finalised in April 2006. The rest of the measures in Turkey have not been evaluated due to the lack of a culture of evaluation, and hence a demand by the high level policy makers. On the other hand, the Ministry of Finance is in the process of adopting the “new public management” approach which places high importance on building an evaluation culture in all public organisations and requires evaluation of all public interventions. The Ninth Five-Year Development Plan (2007-2013) which was approved by the Parliament in June 2006, also foresees independent evaluation of science, technology and innovation policy measures.

In general, it is required to improve the process of designing and delivering innovation policy with a view to develop a coherent and appropriate policy mix. For instance, actions need to be taken to enhance policy reviews of the overall innovation policy mix and to assess the impacts of other policy or regulatory proposals on the innovation performance and potential of Turkey. Furthermore coordination mechanisms should be developed to ensure that the innovation policy measures are implemented in a coordinated manner to avoid overlaps and conflicts between programmes. Considering the increase in the number of policy measures and the level of funds, evaluation of the measures should now be given priority.

Exhibit 3: Overall appraisal of policy making and evaluation practice

Policy making/evaluation practice	Benchmark	Ranking (1 to 5)
Openness of the process of designing innovation policy (measures)	Policy development is undertaken through a partnership based approach involving consultation of key stakeholders at all stages	3
Quality of inputs to policy making (application of evidence based techniques, use of evaluation results):	Policy design is systematically evidence-based and account is taken of evaluation results	2
Regularity and transparency of policy monitoring and review processes	All major policy documents and instruments are the subject of a regular review involving stakeholder consultation	2
The impact on innovation of developments and regulations in other policy fields is appraised	A well-structured process exists for impact assessment of new regulations on innovation &/or innovation is taken into account as an issue in other policy documents.	2
Existence of coordination mechanisms (high-level councils, inter-ministerial committees, etc.)	Well organised coherent system of policy coordination at government and agency levels	3
Existence of an "evaluation culture" in the field of innovation policy	Innovation policy measures are systematically evaluated at key milestones in their implementation.	2
External versus internal evaluations of innovation policy measures	Evaluations respect good practice criteria (involve systematically external experts, evidence based, quality appraisal of evaluation reports, etc.)	2
Transparency and publication of results of evaluations	All evaluations are published &/or discussed in a public forum.	2

Scoring: Compared to the benchmark current practice in the country is judged to be: (1) Completely unsatisfactory; (2) Unsatisfactory (room for improvement); (3) Satisfactory; (4) Above average compared to other EU countries; (5) Best practice in the EU

Note: An evaluation culture (or culture of evaluation) is one in which evaluation, and the lessons drawn from it, form an important element of innovation programme management and policy formulation.

1.2.2 Policy Benchmarking and Transnational Learning

Policy benchmarking, which involves comparing innovation performance, policy making and delivery processes and methods in a systematic fashion with specific benchmark countries or regions, is not a systematic practice in innovation policy making in Turkey. There is, however, some ad-hoc transnational policy learning.

Strategic information on technology and innovation developments as well as innovation policies from other countries have been used by Turkish policy makers and implementers more regularly since the 1990s. TUBITAK's Science, Technology and Innovation Policy Directorate examines international approaches and examples of best practice in the science, technology and innovation policy area, mainly through literature studies. They also participate in the Science and Technology Policies Working Group of the OECD for the same purpose. In early 2007, TUBITAK signed a protocol with the OECD for the preparation of the Turkish NIS review.

Transnational learning is also an important element in the design and implementation of policy measures. Unlike other measures, a more systematic approach has been used for the innovation support schemes implemented under the World Bank supported ITP where a blend of experiences and examples from other countries was transferred by the experts and consultants of the World Bank and by the staff of the relevant agency, and subsequently used in designing Turkish solutions (while

taking account of local conditions and the country's specific needs). Staff exchanges with colleagues from other countries in key agencies have also been a tool used in the ITP.

Transnational learning is also achieved by membership to international organisations. Examples include UME's membership of EUROMET (European Organisation of National Metrology Institutes), MENAMET (Middle East and Northern African Organisation of National Metrology Institutes), IMEKO (International Confederation of Measurement) and EURACHEM (European Organisation of Analytical Chemistry Laboratories). UME attends more than 50 international technical committees in the area of metrology. TTGV has been a member of the Association for Technology Implementation in Europe (TAFTIE) since 1997. They also represent TUBITAK and KOSGEB in TAFTIE and use their membership to provide information, benchmarks and examples of best practices in innovation matters to policy implementers. Similarly, KOSGEB is a member of the International Science Park Association (IASP) and the World Association of Industrial and Technological Research Organisations (WATRO).

Although TUBITAK attaches some importance to policy co-operation with other countries, the bilateral and multilateral programmes are mainly based on scientific research agreements and mainly target universities and research institutes. One exception is the EUREKA programme, which is coordinated by TUBITAK-TEYDEB and intends to increase the number of participating private sector companies. TUBITAK-TEYDEB also co-finances projects of Turkish partners in EUREKA.

Some EC funded projects and programmes, such as the 'EUROMED Technology and Innovation Programme'⁸ contribute to the translational learning efforts.

Finally, Turkish policy makers and implementers attach special importance to the association with the Community Framework Programmes as a means for facilitating transnational learning. For this purpose, the 'Turkish Research and Business Organisations-Public-Private Partnership' (TuR&Bo-ppp) was jointly established by TUBITAK, KOSGEB, TOBB and Confederation of Tradesmen and Craftsmen (TESK) and opened an office in Brussels to develop close relations with the European Commission and similar liaison offices from other countries.

Exhibit 4: Overall appraisal of policy benchmarking and learning initiatives

Tool for policy learning	Benchmark	Ranking (1-5)
Formal mechanisms for policy learning (studies, innovation observatories, study visits, joint events with other countries, etc.)	Exists on a permanent basis (e.g. observatory) or at least one occurrence on an annual basis	2
Application of foreign experience in designing measures (e.g. involvement of foreign experts in design phase)	Systematically (all new policy measures take into account foreign experience)	3
Exchange or hiring of innovation policy staff/experts to/from other countries (e.g. twinning programmes with new member states or candidate countries)	Long-standing and regular policy of exchange of staff	2
Involvement of senior policy makers /executives in trans-national networks (e.g. TAFTIE, OECD committees, etc.)	Key government or agency staff are members in such networks and play an active role (e.g. management committee, organisation of events, etc.)	4
Carrying out quantitative or qualitative benchmarking exercises to assess comparative innovation performance (scoreboards, etc.)	Benchmarking is a systematic process & results are incorporated into policy	2
Implementing policy co-operation with other countries: bilateral or multilateral programmes on innovation, etc.	Many long-term agreements operating (specifically in field of innovation, technology transfer, etc. as distinct from scientific research agreements)	2

Scoring: compared to the benchmark current practice in the country is judged to be: (1) completely unsatisfactory; (2) unsatisfactory (room for improvement); (3) satisfactory; (4) above average compared to other EU countries; (5) best practice in the EU.

⁸ EUROMED has the objective to strengthen new concepts and methods and to disseminate innovative practices by developing exchanges between planners, policy makers and stakeholders in the MEDA region in relationship with European public and private partners.

1.2.3 Overall appraisal and SWOT of innovation governance

Exhibit 5: Innovation governance SWOT overview

Strengths	Weaknesses
<ul style="list-style-type: none"> • Existence of policies and measures for innovation • Existence of a well-developed institutional framework • Increase in the political commitment to designing and implementing science, technology and innovation policies • Existence of pro-active, bottom-up initiatives in favour of innovation 	<ul style="list-style-type: none"> • Linear view of innovation in current science and technology strategy implementation plan and in the national innovation strategy • Low capacities in transferring applied knowledge in innovation mainly due to weak co-operation between research and business community • Low level of awareness and attempts for regional innovation policy making and governance • Low levels of co-operation, communication and co-ordination among all stakeholders in the innovation governance system • Lack of a systematic and continuous monitoring and evaluation system for innovation policy measures
Opportunities	Threats
<ul style="list-style-type: none"> • Move towards third generation innovation policy where innovation is integrated in each policy area • Successful implementation of innovation policies • Successful implementation of economic programme and structural reforms • Turkey's integration with the EU and participation in EU programmes • Decentralised innovation policy making and governance with effective co-ordination at national level 	<ul style="list-style-type: none"> • Continued ignorance of innovation as an integral part of all policy areas • Macroeconomic and political instability risks • Failure to implement economic programme and structural reforms • International political and economic uncertainty and instabilities in Turkey's neighbourhood.

Since the past three years, Turkey has been experiencing an increase in the political commitment in science, technology and research. Starting from the second half of 2004, the Government, through BTYK and TUBITAK, committed itself to increase investments in R&D, and initiated a 'science and technology movement' where a number of actions will be taken to raise awareness of science and technology, to develop scientists, to support result-oriented high quality research, to increase the effectiveness of national science and technology governance, to enhance the science and technology performance of the private sector, to develop research environment and infrastructure and to activate national and international linkages of researchers.

Pro-active and bottom-up initiatives in favour of innovation remain as a strength of Turkey. In 2005-2006, the actions taken by a group of private and non-governmental organisations to create and disseminate a culture of innovation under the 'Ekin Project', and those implemented in the same manner by the National Innovation Initiative, have been very influential (see Section 2.2.1). The Innovation Association established in March 2007 as a private-public partnership by high level managers and experts from the non-governmental organisations and key ministries undertakes the role of creating and disseminating culture of innovation among key stakeholders (in particular among public sector, chambers and other NGOs and enterprises from all sectors).

Although the new strategies may contribute to sustaining some strengths and help the elimination of certain weaknesses, they are not sufficient to address the challenges and to exploit all opportunities since they do not consider all necessary elements of innovation policy and of the innovation governance system. Another important shortcoming of these strategies is that they are based on a linear view of innovation which is heavily focused on R&D.

The implementation plan for the new strategies places R&D, scientists and research institutions at the heart of the policies while the importance of the private sector and its innovation activities are not

given sufficient emphasis. Innovation is directly linked to R&D, although there are other means and forms of innovation which must be addressed by the policies. The recently announced innovation strategy covering 2008-2010 focuses mostly on the relation between science, technology and innovation and does not sufficiently address the innovation challenges facing Turkey.

Another important issue is that recent developments in science, technology and innovation policy making continue to neglect the policy making and governance dimensions. There is still an urgent need to design and implement policies at regional level and to ensure co-ordination, coherence and complementarities between national and regional policy making and governance.

To a large extent, the strengths and weaknesses of the national innovation governance system are determined by cultural attitudes. While entrepreneurship, risk-taking and mobility are important strengths of the Turkish innovation system, co-operation, communication and co-ordination are the main cultural weaknesses which affect innovation governance in a negative way. On the other hand, as culture is a dynamic concept, those weaknesses can be eliminated by designing and implementing appropriate measures.

Finally, structures (or the lack thereof) for systematic monitoring and evaluation of innovation policy measures remain a weakness of the system, thus hampering efforts to determine whether measures meet their objectives efficiently and effectively and how successful the responsible agencies are in the implementation process.

1.3 The Regional Innovation System

1.3.1 Tracing the evolution in the main regional governance characteristics

As highlighted in various Government documents⁹, regional disparities are high in Turkey. There are imbalances between the regions with respect to population structures, technical and social infrastructures, entrepreneurship, human resources, education levels, availability of health services, environmental quality, employment and income levels. Similarly, the regional distribution of industrial enterprises is uneven and concentrated in the Marmara region, which accounts for 51.8 percent of Turkey's total industrial value added. Although there is no official data on regional R&D and innovation performances, the regional breakdown of government R&D and innovation support leads to the conclusion that industrial R&D and innovation activities are also concentrated in the Marmara region (the region accounts for more than 60 percent of projects supported by the funding agencies).

While the above picture shows the crucial need for the establishment of regional innovation systems, and the design and implementation of regional policies, there is no regional approach to innovation policy in Turkey. There is no mention on the regional innovation in the National Innovation Strategy (2008-2010) issued by TUBITAK either.

On the other hand, the government puts strong emphasis on regional development. A law on the establishment of regional development agencies (RDAs) was enforced in February 2006 and two pilot RDAs were established. Regional innovation related issues have also been covered in the Ninth Five-Year Development Plan (2007-2013). The Plan foresees the establishment of innovation infrastructures in regions, and the identification and support of the innovative sectors in regions.

Currently, EU Research Framework Programmes are the only driving force for the regions to implement regional innovation projects in a bottom-up manner. There are two projects being conducted this way: 'Regional Innovation Strategies' project in Mersin (RIS-Mersin) and 'Supporting Potential and Existing Research Intensive SMEs' in Adana. While the former aims at designing the innovation strategy for Mersin region with the involvement of regional stakeholders, the latter deals with the question of the optimisation of the regional innovation system in Adana. Both regions are

⁹ Examples include the Ninth Five-Year Development Plan (2007-2013) and Preliminary National Development Plan for the period of 2004-2006 (DPT, 2003, <http://ekutup.dpt.gov.tr>)

covered by one of the two pilot RDAs (Cukurova Regional Development Agency). Since these two projects were initiated and are implemented in a bottom-up manner and since regional innovation strategies have never been discussed in the national innovation policies (including the new National Innovation Strategy (2008-2010)) it is not possible to talk about the coordination of regional innovation policies with the national innovation policy governance level.

Exhibit 6: Changes in the regional governance of innovation policy the past 6 years

Level of regional/local government	Changes in legislative &/or administrative authorities	Changes in powers related to innovation policy, if any
81 provinces and 850 towns with local administrations	26 Regional Development Agencies to be established in accordance with the law enforced in 2006 (however the constitutional consultation is conducted for the process of creating RDAs)	<p>The roles of the regional development agencies are defined in the Law. Those related to innovation include the following:</p> <ul style="list-style-type: none"> - Implementing and supporting research for the identification of natural, economic and human resources, and increasing the economic development and competitiveness of the region - Promoting the business and investment potential of the region at national and international level in co-operation with the relevant institutions - Supporting small and medium sized enterprises and start-ups in terms of management, production, promotion, marketing, technology, finance, organisation and human resources training in co-operation with relevant institutions - Promoting activities in bilateral or multinational programmes in which Turkey participates in the region and contributing to the efforts of project development in that respect.

1.4 Appraisal of the Regional Governance System

1.4.1 Regional Policy Making and Evaluation Practices

Since there is no regional approach to innovation policy in Turkey it is not possible to appraise the regional policy making and evaluation practices. The project was started in 2005 to design the regional innovation strategies for Mersin under the FP6 follows the RIS methodology of the EU¹⁰. Since the RIS methodology is based on good practices in policy making, the scores in Exhibit 7 below are high for Mersin's regional policy development process. In Mersin, the strategy design process involves all key stakeholders in the region. Stakeholder involvement is achieved through workshops, surveys and face-to-face interviews throughout the process of drafting the strategy. The draft strategy has been open to debate at a regional forum organised by the end of 2006 and also opened to public consultation via the Internet. The strategy has been designed by taking into account the findings from workshops, supply and demand surveys and interviews with the industry (also see Annex 2).

It is expected that policy measures will be designed and implemented at the regional level after the finalisation of the strategy. Since the project is at the stage of strategy design it is too early to talk about evaluation practices, and therefore, "not applicable" has been used for evaluation rankings in the exhibit below.

¹⁰ www.innovating-regions.org

The following table is completed considering the current practices in the 'RIS Mersin' project. It is not applied to the other regions in Turkey due to the lack of regional innovation policy making practices.

Exhibit 7: Overall appraisal of regional policy making and evaluation practice

Policy making/evaluation practice	Benchmark	Ranking (1 to 5)
Openness of the process of designing innovation policy (measures)	Policy development is undertaken through a partnership based approach involving consultation of key stakeholders at all stages	5
Quality of inputs to policy making (application of evidence based techniques, use of evaluation results):	Policy design is systematically evidence-based and account is taken of evaluation results	5
Regularity and transparency of policy monitoring and review processes	All major policy documents and instruments are the subject of a regular review involving stakeholder consultation	5
The impact on innovation of developments and regulations in other policy fields is appraised	A well-structured process exists for impact assessment of new regulations on innovation &/or innovation is taken into account as an issue in other policy documents.	4
Existence of coordination mechanisms (high-level councils, inter-ministerial committees, etc.)	Well organised coherent system of policy coordination at government and agency levels	4
Existence of an "evaluation culture" in the field of innovation policy	Innovation policy measures are systematically evaluated at key milestones in their implementation.	Not applicable
External versus internal evaluations of innovation policy measures	Evaluations respect good practice criteria (involve systematically external experts, evidence based, quality appraisal of evaluation reports, etc.)	Not applicable
Transparency and publication of results of evaluations	All evaluations are published &/or discussed in a public forum.	Not applicable

Scoring: Compared to the benchmark current practice in the country is judged to be: (1) Completely unsatisfactory; (2) Unsatisfactory (room for improvement); (3) Satisfactory; (4) Above average compared to other EU countries; (5) Best practice in the EU

1.4.2 Regional Policy Benchmarking and Trans-regional Learning

Due the lack of the regional approach to innovation policy in Turkey, this section outlines the practices in the only regional innovation strategy development project RIS Mersin supported under FP6. The stakeholders responsible for the design of the regional innovation strategy has been identifying and reviewing the strategic information on technology/innovation developments or innovation policies from other regions outside the country. This has been achieved through document reviews and study visits to other regions. The project team also regularly attends the training workshops and conferences of the 'Innovating Regions in Europe Network'. The stakeholders learn from the experiences of the project partner 'Business Innovation Centre of Epirus' in Greece through continuous dialog during the lifetime of the project.

1.4.3 Appraisal and SWOT of the Regional Innovation Governance in the Dominant Regions

Exhibit 8: Regional Innovation governance SWOT overview – dominant regions

Region 1: Mersin	
Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Young and entrepreneurial human resources • Existence of universities and other reputable education institutes to develop human resources for innovation ▪ Diverse and dynamic economic activities caused by simultaneous growth of agriculture, services and industry sectors ▪ Strategic location as a gateway to the Middle East and Mediterranean sea 	<ul style="list-style-type: none"> ▪ Low levels of awareness on innovation among the stakeholders (particularly in firms and in society) ▪ Need to improve the co-operation and communication between the stakeholders of the regional innovation system • Need to improve the regulation and the infrastructure for increasing the research and technology transfer activities ▪ Low levels of incentives and finance for innovation (e.g. regional funds, venture capital and business angels investments)
Opportunities	Threats
<ul style="list-style-type: none"> ▪ Development and successful implementation of the regional innovation strategy ▪ Successful implementation of Mersin's transformation plan ▪ Active participation in the EU and national programmes on research and innovation ▪ Increasing the co-operation with neighbourhood regions and countries on innovation • Increased commitment of the government in regionalisation ▪ Increased commitment of the government in R&D and innovation 	<ul style="list-style-type: none"> ▪ Lack of regional commitment in implementation of strategies ▪ Macroeconomic and political instabilities ▪ Unsuccessful implementation of national regionalisation plans • Tensions and instabilities in the Middle East
Region 2: Adana	
Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Existence of a university with good R&D capacity ▪ Success in removal of cultural barriers in university-industry co-operation for R&D unlike many other regions of Turkey ▪ Existence of R&D intensive large companies demanding R&D intensive SMEs as suppliers ▪ Existence of regional commitment and collaboration for increasing RTDI investments for development and growth • Existence of quality human resources for RTDI 	<ul style="list-style-type: none"> ▪ Lack of regional RTDI strategies ▪ Low level of awareness on and insufficient investments in RTDI by SMEs ▪ Need to integrate and coordinate private and public RTDI investments ▪ Need to establish an effective system for regional RTDI governance ▪ Low shares in public R&D finance schemes in spite of the regional potential
Opportunities	Threats
<ul style="list-style-type: none"> ▪ Design and successful implementation of regional RTDI strategies ▪ Creating mechanisms for stimulating establishment of new technology-based firms and university spin-offs • Exploiting opportunities in transnational learning for promoting an RTDI-based development 	<ul style="list-style-type: none"> ▪ Decrease in the commitment and support of the national government for RTDI ▪ Macroeconomic and political instability risks in the country • International political and economic uncertainty and instability risks

2. Policy Objectives and Trends

2.1 Overview of the Main Trends in the National Innovation System

2.1.1 Recent Trends in Macroeconomic and Market Developments

For more than 25 years, the Turkish economy has experienced major problems caused by high inflation and high real interest rates. Both have weakened the performance of the Turkish economy in many respects. A major problem for the production sector was that resources were absorbed by the public sector, thus reducing the funds available for the private sector, which led to a shift from production investments to financial investments. As the banking sector has directed its funds to public finance instead of private sector investments, private sector savings have mostly been used to finance the public sector deficit. This shift deepened the problems of unemployment, production and competitiveness and caused serious crises in 2000 and 2001.

In the last decade, public sector imbalances, crises in Asia and Russia, the earthquake in 1999 and the economic crises of 2000 and 2001 all negatively affected Turkey's economic performance in addition to high inflation and high interest rates. Real GDP growth fell from 7.4 percent in 2000 to -7.5 percent in 2001. In April 2001, a programme for restructuring the economy and achieving long-term stability was designed. The new programme and newly introduced structural reforms have resulted in a remarkable economic recovery which led to a GDP growth of 6.1 percent in 2006, more than double of the EU 27 average. Inflation fell to 9.3 percent in 2006 from 53.2 percent in 2000, thus remained in single digits despite the depreciation of the Turkish lira in the wake of the financial turmoil in May 2006.

The crises in 2000 and 2001, leading to higher interest rates and inflation and to fluctuations in the exchange rates, created serious problems for the industrial and service sectors. Nevertheless, from 2002 onwards, industry and trade have led the economic recovery. There is gradual increase in the labour productivity per person employed since 2001. In spite of positive trends in many aspects of the economy, the unemployment rate has increased steadily since the crisis in 2001 and rose to 10.3 percent in 2005 (up from 6.5 percent in 2000). In 2006, it dropped slightly to 9.4 percent. As revealed by the World Bank 'Turkey Labour Market Study', unemployment rates are especially high for educated young people (38.5 percent of university graduates aged between 20-24 years are unemployed)¹¹. Total employment growth in 2006 is slightly higher than the EU 27 average.

The rate of foreign direct investment (FDI) has always been lower (less than one percent of GDP) in Turkey than in other emerging markets, mostly because of heavy bureaucratic procedures and political and economic uncertainties. Nevertheless, the reform programme for the improvement of the investment climate and privatisation efforts started to yield positive results. Large-scale acquisitions in services, particularly in telecommunications and banking increased FDI inflows to Turkey.

A comparison of Turkey's economic performance with that of the EU-25 averages is given in Exhibit 9 below.

¹¹ World Bank, Turkey Labor Market Study, April 14, 2006 (www.worldbank.org.tr)

Exhibit 9: Comparable indicators of economic performance

Indicator	National performance		EU 27 average	
	2001	2006	2001	2006
GDP per capita in PPS (EU25=100)	25.7	28.1	100*	100*
Real GDP growth rate (% change previous year)	-7.5	6.1	2.0	3.0
Labour productivity per person employed (EU25=100)	35.2	40.7	100*	100*
Total employment growth (annual % change)	-1	1.6	1.0	1.4
Inflation rate (average annual)	56.8	9.3	2.2	2.2
Unit labour costs (growth rate)	:	:	0.2	-0.8
Public balance (net borrowing/lending) as a % of GDP	-29.8	-1.2 [^]	:	-1.7
General government debt as a % of GDP	105.2	69.6 [^]	:	61.7
Unemployment rate (as % of active population)	8.3	9.4	8.4	7.9
Foreign direct investment intensity	1.3	1.5 [^]	:	1.2 [^]
Business investment as a percentage of GDP	18.1	:	17.8*	17.4* [^]

Source: Eurostat - Structural Indicators and Long-term Indicators <http://epp.eurostat.ec.eu.int>

key: (*) EU25 average, (^) or latest available year (for example: 2005); (:) not available

Since macroeconomic conditions play an important role in the creation of a favourable environment for innovation, high long-term inflation and high interest rates, as well as factors like the low level of FDI in Turkey have been significant disincentives in this respect.

According to the result of the latest 'Technological Innovation Survey in Industrial and Services Sectors' conducted by the TUIK in line with the CIS methodology for the period 2002-2004, 34.58 percent of all firms operating in the manufacturing industry were innovative. The survey also shows that 25.9 percent of all firms in services sector were innovative in the same period. As regards the sectors engaged in innovation activities in the manufacturing industry, the radio, television, communication equipment and apparatus sector ranks first (80.61 percent of firms are innovative). The survey conducted for the services sector concluded that air transport is the most innovative sector, with 79.41 percent of all firms being engaged in innovative activities.

The GERD as a percentage of GDP in Turkey is quite low compared to developed countries. The latest R&D survey conducted by the TUIK covers the year 2004. It shows that the ratio of GERD/GDP is 0.67 percent, as opposed to 1.81 percent in the EU-25 in 2003. On the other hand, there has been a slight increase in GERD since 2000, from 0.64 to 0.67 percent in 2004.

The share of the business sector in R&D expenditure is also quite low (24.2 percent). The percentage of GERD financed by industry, which has almost been doubled during the past decade, is 37.9 percent. The total number of R&D personnel (full time equivalent) - although still low - rose to 33,876 in 2004 (20.5 percent in the business sector), from 23,995 in 2002 (20.4 percent in the business sector). The increase in the number is due to the change of the definitions for researchers in the OECD Frascati Manual.

One significant aspect in the context of innovation performance is the relatively low level of transformation of applied knowledge into innovations and high business developments. Although there is a significant increase in scientific output (the number of publications by scientists in Turkey increased from 2,333 in 1995 to 17,717 in 2005 – Turkey's world ranking accordingly improved from 34th to 19th), the number of patent registration by residents increased from 58 in 1995 to 95 in 2005.

As a result of the poor economic and innovation performances highlighted above, Turkey performs relatively badly when it comes to national competitiveness. According to the Global Competitiveness Report of the World Economic Forum, Turkey was in 59th position out of 125 countries in the 2006 growth competitiveness index (up 12 positions from last year), which is the third lowest ranking of all EU member and candidate states (only Romania and Bulgaria are in a worse position). With respect to the business competitiveness index, Turkey is in 46th position out of 121 countries, showing a better position than that of five EU member states and Croatia. When compared to the rankings of the previous years, the global competitiveness index has improved since 2002 (71st in 2002).

In an analysis of Turkey in the 'Global Competitiveness Report 2006-2007', "innovation and market efficiency" has been identified as one of the positive sides of Turkey when compared with the new member states and candidate countries from the competitiveness point of view. According to the analysis and as seen in below table, Turkey is outperforming not only the other candidate countries, but also a few of the EU10 countries in these indicators.

Global Competitiveness Index Performance of Turkey, recent EU entrants, and candidate countries

Country/Economy	Global CI		Institutions		Infrastructure		Macroeconomy		Health/primary education		Higher education/training		Market efficiency		Technological readiness		Business sophistication		Innovation	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Estonia	25	5.12	30	4.7	30	4.66	16	5.31	43	6.58	23	5.26	25	4.98	16	5.29	35	4.65	30	3.83
Czech Rep.	29	4.74	60	3.8	33	4.50	42	4.81	58	6.42	27	5.04	41	4.43	26	4.74	29	4.96	28	3.98
Slovenia	33	4.64	43	4.3	32	4.51	29	5.08	19	6.83	26	5.07	63	4.17	29	4.51	36	4.64	34	3.71
Average (new entrants)		4.59		4.17		4.28		4.62		6.54		4.64		4.44		4.38		4.48		3.54
Latvia	36	4.57	50	4.1	39	4.33	34	4.93	79	6.27	28	5.01	40	4.44	43	3.98	54	4.28	66	3.19
Slovak Rep.	37	4.55	53	4	47	4.08	68	4.37	74	6.31	38	4.52	34	4.66	30	4.50	45	4.41	42	3.51
Lithuania	39	4.54	59	3.9	44	4.14	41	4.82	70	6.37	29	4.97	45	4.35	42	3.99	41	4.56	50	3.35
Malta	39	4.54	31	4.6	37	4.37	76	4.26	32	6.69	47	4.36	46	4.35	22	5.00	51	4.32	62	3.26
Hungary	41	4.52	46	4.2	48	4.05	98	3.94	66	6.39	30	4.93	37	4.61	35	4.17	49	4.34	31	3.82
Cyprus	46	4.36	35	4.5	34	4.47	72	4.33	22	6.79	41	4.48	55	4.22	38	4.10	50	4.32	55	3.30
Poland	48	4.30	73	3.6	57	3.64	70	4.34	26	6.76	33	4.79	64	4.16	51	3.56	63	4.13	44	3.47
Croatia	51	4.26	66	3.7	51	3.98	73	4.30	67	6.38	44	4.43	88	4.11	47	3.68	61	4.17	45	3.45
Turkey	59	4.14	51	4.05	63	3.46	111	3.58	78	6.28	57	4.15	47	4.35	52	3.56	39	4.58	51	3.35
Romania	68	4.02	87	3.4	77	3.05	97	3.94	69	6.38	50	4.34	76	4.03	49	3.59	73	3.89	68	3.14
Bulgaria	72	3.95	109	3.1	65	3.41	35	4.92	39	6.61	62	4.05	90	3.75	68	3.21	84	3.59	87	2.93

* Countries that joined the EU in May 2004.

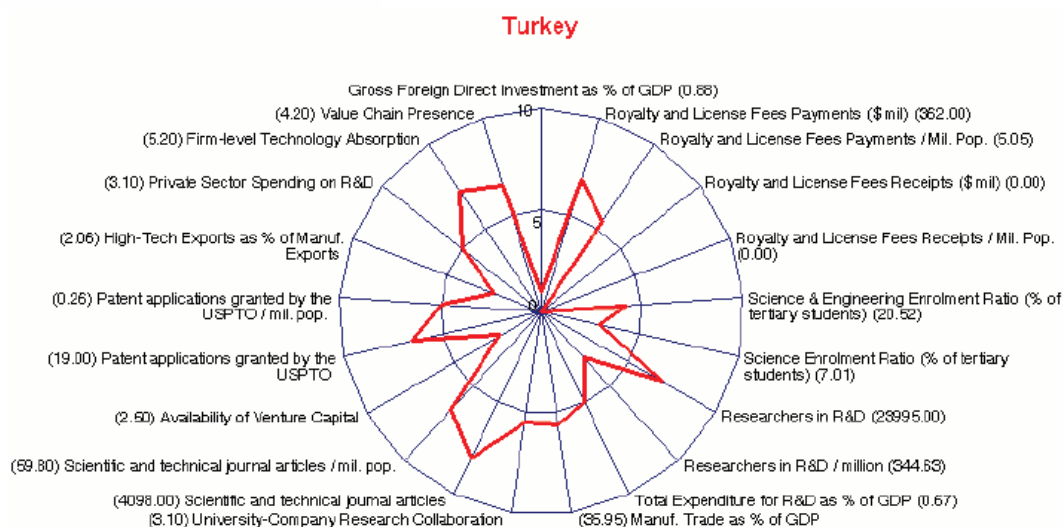
Source: World Economic Forum, Global Competitiveness Report 2006-2007

2.1.2 Recent Trends in National Innovation Performance

The 2006 results of the EIS for Turkey show the country's weak innovation performance (Annex 6). However, similar to the EIS results of the previous years, the poor availability of data continues to be a problem for the evaluation of Turkey's innovation performance.

In the EIS 2006, although at low levels compared to the EU average, positive trends are observed in all innovation drivers indicators (S&E graduates, population with tertiary education, broadband penetration rate, participation in life long learning and youth education attainment level). With respect to knowledge creation, while positive trends in public R&D continue, there is a decline in business R&D expenditures. Only one indicator is available in each of the 'innovation and entrepreneurship' and 'application categories' (ICT expenditures and exports of high technology products, respectively) and both show declines. Trend results suggest improvements in intellectual property.

The innovation variables of Turkey, presented in the World Bank's scorecard, provide a snapshot of Turkey's innovation performance. As shown in the chart below, Turkey performs well in the firm level technology absorption and in the number of scientific and technical journal articles. On the other hand, Turkey's performance is quite weak with regard to the availability of venture capital, royalty and licence fee receipts, gross foreign direct investment as percent of GDP, high-tech exports as percentage of manufacturing exports, private sector spending on R&D, researchers in R&D per million population and patent applications granted by the USPTO per million population.



Source: World Bank

The report "Lisbon Review 2004: An Assessment of Policies and Reforms in Europe"¹² published by the World Economic Forum Report provides an overview of Turkey's performance in key areas including innovation in comparison to EU candidate countries and new member states. According to the study, Turkey lags behind all EU member states and candidate countries in the 'innovation and R&D' sub-index (which corresponds to "developing a European area for innovation, research and development" dimension of the EU's Lisbon Strategy). Nonetheless, although Turkey is the only candidate country which does not have a fixed expected date for EU accession, it was ranked above Bulgaria and Romania in many individual categories and in the overall ranking.

2.2 National Policy Objectives and Trends

2.2.1 Objectives and Targets of National Innovation Policy

As noted above, in March 2007 the BTYK approved the 'National Innovation Strategy (2008-2010)' which is a stand-alone document prepared by TUBITAK. While previously issued documents on broader policy areas (such as science and technology policy, industrial policy and SME policy) also have innovation implications innovation has not been included as distinct theme in any of them.

The 'National Innovation Strategy (2008-2010)' does not cover quantified objectives and specific targets. The objectives listed in the document are as follows:

- To encourage entrepreneurship, innovation and productivity
- To use science and technology capacity in the country at maximum level
- To support development of sustainable, strong and competitive markets
- To develop appropriate infrastructure and environment
- To develop international cooperation
- To develop the management and coordination of innovation system

¹² WEF, "Lisbon Review 2004: An Assessment of Policies and Reforms in Europe"
(http://www.weforum.org/pdf/Gcr/LisbonReview/Lisbon_Review_2004.pdf)

The Science and Technology Strategy approved by the BTYK in September 2004 includes the following objectives:

- Increasing demand for R&D,
- Increasing the number and quality of scientists, vocational and technical staff,
- Increasing GERD as a percentage of GDP.

In line with these objectives, the main targets (to be reached by 2010) are to increase the ratio of GERD/GDP to 2 percent (from 0.66 percent in 2002) (half of this amount being invested by the private sector), and to raise the number of full-time equivalent R&D personnel to 40,000 (from 23,995 in 2002). The number of vocational and technical staff should be increased proportionally at the same time.

The following strategic objectives were defined in the implementation plan of the science and technology strategies (2005-2010) approved by the BTYK in March 2005:

- Raising awareness of science and technology,
- Developing scientists,
- Supporting result oriented and quality research,
- Increasing the effectiveness of national science and technology governance,
- Enhancing the science and technology performance of the private sector,
- Developing a research environment and infrastructure and activating national and international linkages of researchers.

Each of above objectives covers a number of actions that require new or improved policy measures as well as regulatory and administrative improvements. Some of these actions are directly linked to innovation, such as supporting the establishment of science and technology-based innovative firms under the objective of 'developing scientists'; improving venture capital legislation under 'increasing the effectiveness of national science and technology governance' objective, and the use of R&D in public procurement under the objective of 'enhancing the S&T performance of the private sector'.

Exhibit 10: National innovation policy objectives

Objective	Quantitative target	To be achieved by (year)
Increasing the gross domestic expenditure of R&D (GERD) as a percentage of GDP (%)	2	2010
Increasing the GERD per capita (US\$, PPS)	124	2010
Increasing the number of total researchers (fulltime equivalent)	40,000	2010
Increasing the number of researchers per thousand employed	2.3	2010
Increasing the business expenditure on R&D (BERD) as a percentage of GERD (%)	50	2010
Increasing the public expenditure on R&D as a percentage of GERD (%)	12	2010
Increasing the number of triadic patents	100	2010
Increasing the number of scientific publication per million population	400	2010
Increasing the number of science citation per million population	150	2010
Increasing the SMEs innovating in-house (% of all SMEs)	40	2010
Increasing the SMEs involved in innovation co-operation (% of all SMEs)	20	2010
Increasing the sales of 'new to market' products (% of total turnover)	10	2010
Increasing the share of manufacturing value-added in high-tech sectors	10	2010

Objective	Quantitative target	To be achieved by (year)
Increasing the tertiary-type A education graduates participating in workforce (men) (%)	90	2010
Increasing the tertiary-type A education graduates participating in workforce (women) (%)	80	2010
Improving the competitiveness ranking	35	2010
Improving the global competitiveness index ranking: infrastructure	45	2010
Improving the competitiveness ranking: Legal environment influencing scientific research	35	2010

Since 2005, innovation continues to be a hot topic for discussion in Turkey and innovation policy is now driven by a broader public awareness. Civil initiatives in this respect play an important role and were mainly triggered by the TrendChart products of previous years. The Annual Innovation Policy Trends and Appraisal Report of Turkey (2006) and the EIS published within the framework of the European Trend Chart on Innovation were also important factors underlying recent innovation policy developments. They were reviewed and referred to by policy makers and implementers and were informed BTYK's decisions in March 2006 regarding the collection of the innovation related statistics¹³, and in September 2006 on the design of national innovation strategies with the involvement of all stakeholders. Both have also attracted media attention and were given remarkable coverage, thus opening up the way for a wide public debate of the issues covered by the report.

The National Innovation Initiative (NII)¹⁴ coordinated by the TUSIAD-Sabancı University Competitiveness Forum (REF) has also had positive impacts on innovation policy in Turkey. The meetings and press conferences of the NII Council (which consist of 21 members including leading executives from the private sector, rectors of several established universities and leaders from some of the influential non-governmental organisations in Turkey), and the studies of the strategy document working groups were also important in this respect¹⁵. The NII released the 'Innovation Framework Report' by the end of 2006 which suggests national innovation strategies and carried out lobbying activities at policy level.

The project "Triggering a Cultural Change for Innovation"¹⁶ (Ekin Project) implemented by a group of private sector and non-governmental organisation (Technology Management Association, Turkish Informatics Foundation, METUTECH, Referans daily, Technopolis-Group and ISPIM) is another important action shaping innovation policies in Turkey. As a result of the project and in co-operation with the Education Board of the Ministry of National Education, innovation started to be taught in the national curricula of compulsory education. The regional conferences, news and advertisements of the project were also very influential in raising awareness of innovation.

The Innovation Association was established in 2007 as a private-public partnership by high level managers and experts from the non-governmental organisations and key ministries to create and disseminate culture of innovation among key stakeholders (in particular among public sector, chambers and other NGOs and enterprises from all sectors).

With the increased awareness on the subject, the number of business plan competitions and innovation events organised by techno-parks, non-governmental organisations and private companies have considerably increased.

The World Bank's publications (such as the "Turkey: Country Economic Memorandum (2006) Promoting Sustained Growth and Convergence with the European Union" with a specific chapter under titled "Fostering Technology Adoption, Innovation, and Skills") and the 'Innovation Workshop' organised by the Bank towards the policy makers have also been influential in opening debate on innovation in policy circles.

¹³ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.informations&page=detail&id=1523>

¹⁴ <http://www.ref.sabanciuniv.edu/>

¹⁵ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.informations&page=detail&id=1681>

¹⁶ <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.informations&page=detail&id=1646>

2.2.2 Overview of National Innovation Policy Mix

Until the last quarter of 2006, the number and diversity of innovation policy measures in Turkey was very limited. While there is still a need for more balanced policy mix, the new measures introduced in late 2006 and in 2007 contributed to the enrichment of the policy mix. Overall, the existing policy mix focus on four main categories: (1) Increasing the rates of expenditure on research and technological innovation in enterprises, (2) Intensifying co-operation between public or higher education research organisations and enterprises on R&D activities, (3) Increasing the number of new innovation intensive enterprises created and their survival, and (4) Increasing the rate of commercialisation / marketing of the results of R&D activities by research and higher education organisations. The measures addressing last three categories were newly introduced.

Considering the categories covered by the existing policy mix, one can conclude that there a large number of areas which are not addressed by the measures. For example, policy measures to foster an innovation friendly environment, and those aiming to develop future skills base, innovation intermediaries and non-technological innovation, to optimise financial regulations, and to exploit new market opportunities are among the important areas which need to be addressed by policy measures.

There is no regional and sectoral focus in the existing policy measures. Since the measures are designed and implemented at the national level it is not always possible to create a broad impact. It is even very difficult to promote centrally managed schemes throughout the country. For instance, the evaluation of the World Bank financed ITP indicated that only 8-10 percent of firms operating in the manufacturing sector had an idea about the TTGV's R&D support programme in 1995-2005¹⁷.

There have been a number of weaknesses reported regarding the implementation rules and regulations of some of the old on-going measures. Interviews with current and potential beneficiaries and formal evaluations reveal that the provision of collaterals for soft loans, for example, has been seen as major problems, particularly for SMEs. It is also observed that particularly for the new measures, no or limited stakeholder consultation has been conducted at the designing phase of the programmes. The measures were mainly developed by the officials of the implementing agencies. This approach prevents the measures to respond the needs and requirements of the target groups and to be implemented in a client-friendly manner. Another issue with design of the measures is the lack of an evaluation framework. No indicators were defined for measures and progress can not be monitored against targets.

To summarise, the policy mix contributed to a large extend to the stimulation of an R&D culture in the private sector and helped industry develop links with the research community. Introduction of a relatively large number of new measures (almost equal to the number of on-going measures of last year) is also a very positive development. However, it is required to address the areas not covered by the current policy mix, and to ensure that policy mix is strategically focused on priorities and is able to create broad impact. Also, more care should be taken in the design and implementation of measures.

2.2.3 Recent National Policy Trends

The INNO-Policy TrendChart policy monitoring exercise tracks developments in innovation policy not only at the level of policy definition and the setting of overall objectives as discussed in the previous sections, but also through the compilation of information in an analytical structure on specific innovation policy measures (IPM). At the present time, the INNO-Policy TrendChart database contains over 2000 IPM fiches detailing measures implemented in 39 countries. An innovation policy measure is defined broadly to include any public policy initiative that directly or indirectly impacts on the innovation process in the enterprise sector. In practice, the TrendChart Innovation Policy Measures (IPM) fiches tend to fall into one of the following categories of measures:

- Intervention in the form of financial support State Aid to enterprises through programmes of grants, loans, etc. (e.g. grants for product development);

¹⁷ Taymaz, E. An Assessment of the Industrial Technology Project, 2006

- Funding of innovation programmes or projects aimed at groups of innovation stakeholders with the objective of improving cooperation and collaboration and thereby the functioning of the innovation system (e.g. cluster);
- Measures taken to improve, disseminate or develop knowledge about specific aspects of national innovation systems (e.g. sectoral or regional strategies, foresight exercises, the innovative performance of firms through spread of best practice, etc.);
- Action to improve the functioning of institutions (legal acts, regulations) which affect innovation processes and performance (e.g. intellectual property rights, financial markets, creation of firms);
- Funding of innovation infrastructure and intermediaries such as innovation centres, incubators, etc.

This section of the report describes in more detail the current policy mix adopted in Turkey in terms of the political priorities and human and financial resources allocated to each of these broad types of measures. Further details on the specific innovation policy measures can be found in annex 5 and via the INNO-Policy TrendChart website.

The old on-going policy measures (TR 02, TR 05, TR 06, TR 15 and TR 23) are concentrated around the actions for financing innovation and strengthening research carried out by companies. The programmes implemented for these purposes cover complementary activities that are instrumental in meeting some other objectives such as the protection of intellectual and industrial property rights and intensified co-operation between research, universities and companies.

With the addition of new measures explained below, the higher portion of funds allocated from the state budget were reserved for industrial R&D and innovation compared to the past years where the majority of funds were utilised for research (approximately €210 million allocated for industrial R&D and innovation in 2007 as opposed to €132 million in 2005 for example). In addition, TTGV, whose majority of funds were provided by the World Bank until last, year started to allocate its own resources to the new measures it developed in mid-2006.

Although with the new measures the policy mix in Turkey has been enriched, there is a need to review the current policy mix to avoid overlaps, ensure complementarities and design new measures for areas which are not covered by existing schemes. For example, schemes fostering innovative organisational and management practices in enterprises are those managed by KOSGEB and are only cover SMEs although such measures are needed for all enterprises in the country. Measures to promote clusters for innovation to increase regional competitiveness are very limited. There is a need to increase efforts for the dissemination of information, the development of specialist training, the provision of advice and the dissemination of best practice and experience.

In addition, much work also remains to be done to create framework conditions that are conducive to innovation, although some efforts are already made. Under the Science and Technology Policies Implementation Plan, TUBITAK aims to take steps to improve the financial, administrative and legal infrastructure, such as the universities' revolving fund regulations, venture capital legislation and R&D support mechanisms. In addition to those improvements, efforts should be concentrated on administrative simplification and the improvement of legislation and regulations in all fields that directly and indirectly affect the innovation activities of the private sector.

Over the last 12 months 13 new policy measures were introduced by the Ministry of Industry and Trade, TUBITAK and TTGV (see Exhibit 11 below). The new measures mainly aim at strengthening the links between research community and the private sector (TR 32, TR 34 and TR 38) and encouraging the creation of high-tech start-ups (TR 39, TR 41, 42 and TR 43). Both the schemes targeting to strengthen the links between universities/research institutes and firms and aiming to provide seed and start-up finance for entrepreneurs and new technology-based firms address the significant challenges facing Turkey (also see Section 3.1). Three new measures of TTGV (TR 35, TR 36 and TR 37) aim to contribute to sustainable development through eco-innovation.

Furthermore, one of the measures (TR 44) specifically addresses the weakness of patent application levels in Turkey by funding patenting costs. In Turkey, the importance of IPR has not been well

understood by researchers and firms until recently. There has been an increasing trend in IPR applications to the TPE since 2004. According to TPE data, trade mark and industrial design applications increased by 25 percent in 2005. However, the number of national and international patent applications is still low (number of national patent applications in 2003 is only 76) and there is a very slight increase in triadic patents since the 1990s.

The new measure of the Ministry of Industry and Trade (MoT) ('Industrial Thesis (San-Tez) Projects' (TR 32)) aims to stimulate co-operation between firms and universities by supporting masters and doctorate thesis written out by a number of graduate level students. The theses address research and innovation projects which aim to develop new technology-based products and processes, and to transform university research into innovative products and processes in line with the needs of the industry. With the newly issued 'Act on the Amendment of the Ministry of Industry and Trade's Organisation and Tasks' the MoT plans to design new R&D and innovation measures complementary to the San-Tez.

TUBITAK's new 'Support Programme for the First R&D Projects of SMEs' (TR 40) emerged from the need that SMEs face difficulties in the existing R&D support of TUBITAK (TR 5) since it requires more paperwork and the project evaluation process is lengthy. TUBITAK decided to develop this new scheme, which is very similar to TR 5, in order to increase the number of R&D projects carried out by SMEs by offering a much faster and easier access for funding.

ISBAP (TR 38), another new measure of TUBITAK, has been inspired by the technology platforms developed under the 6th Framework Programme of European Union. The measure foresees the creation of networks, platforms and clusters which are expected to carry out various activities to enhance research and innovation capabilities of their members. With the enforcement of this programme 'University-Industry Joint Research Centres (USAMs) Programme' (TR 7) of TUBITAK which helped establishment of joint research centres by a triple helix model of university-industry-government interactions was abolished by the end of 2006. Activities of previously established six USAMs will be funded through this new measure.

TTGV's new measures were initiated right after the completion of the World Bank financed Industrial Technology Project (ITP) through which technology development projects (TDP) were funded by soft loans. The new schemes (TR 33, TR 39, TR 41 and TR 42) were designed by taking into account the results of independent evaluations conducted for ITP as a requirement of the World Bank (see Section 4.1). The ex-post evaluation report of the ITP draws attention to the need for providing start-up funds and commercialisation support: *"In ITP, TTGV continued to provide mainly same type of R&D support in provided under TDP (but financially in a more conservative way by imposing requirements on collateral, etc.). However, TUBITAK already started to provide grants for R&D. TTGV could, as many firms suggested, consider moving into complementary stages, start-up support and commercialisation support. If firms think they cannot finance commercialisation, they hesitate to conduct R&D even if there is R&D support. Thus, there is a need to consider evolving and broader needs of financial support for technology development"*¹⁸.

TTGV's three new schemes aiming to support the development of renewable energy technologies and dissemination of renewable energy applications (TR 35), to decrease the greenhouse gas emissions by removing financial barriers for energy efficiency investments of industry and promotion of the usage of energy efficient technologies (TR 36) and to support development and dissemination of cleaner technologies which provide better use of chemicals, raw materials and energy, and thus, decrease amount of industrial waste and pollution (TR 37) were introduced as the first eco-innovation related measures in Turkey.

¹⁸ Taymaz, E. "An Assessment of the Industrial Technology Project", 2006

Exhibit 11: New Innovation Policy Measures over last 12 months

IPM N°	Title	Innovation policy framework category	Organisation responsible
TR 32	Industrial Thesis (San-Tez) Projects	III.6. Intensifying co-operation between public or higher education research organisations and enterprises on R&D activities	Ministry of Industry and Trade
TR 33	Commercialisation Project Supports	IV.4. Increase the availability of private sector innovation financing to enterprises	TTGV
TR 34	Joint Technology Development Projects	III.6. Intensifying co-operation between public or higher education research organisations and enterprises on R&D activities	TTGV
TR 35	Renewable Energy Support Programme	IV.4. Increase the availability of private sector innovation financing to enterprises	TTGV
TR 36	Energy Efficiency Support Programme	IV.4. Increase the availability of private sector innovation financing to enterprises	TTGV
TR 37	Environmental Technologies Support Programme	IV.4. Increase the availability of private sector innovation financing to enterprises	TTGV
TR 38	Scientific and Technological Cooperation Networks and Platforms Support Programme (ISBAP)	I.4. Encourage mutual policy learning and networking between policy-making at regional, national and EU levels	TUBITAK
TR 39	Pre-Incubation Support Programme	IV.1. Increase the number of new innovation intensive enterprises created and their survival	TTGV
TR 40	Support Programme for the First R&D Projects of SMEs	IV.4. Increase the availability of private sector innovation financing to enterprises	TUBITAK
TR 41	Start-up Support	IV.1. Increase the number of new innovation intensive enterprises created and their survival	TTGV
TR 42	Risk Sharing Facility Support	IV.4. Increase the availability of private sector innovation financing to enterprises	TTGV
TR 43	Support Programme for Technology- and Innovation-focused Entrepreneurship	IV.1. Increase the number of new innovation intensive enterprises created and their survival	TUBITAK
TR 44	Support Programme for Patent Applications	V.4. Increase the rate of commercialisation / marketing of the results of R&D activities by research and higher education organisations	TUBITAK

2.3 Regional Objectives and Trends

2.3.1 Main Regional Policy Trends

As noted in section 1.3, there is no regional approach to innovation policy in Turkey, although it would be very important to have one. It is expected that the regional development agencies to be established under new legislation for the decentralisation of governance ('Law on the Establishment, Coordination and Duties of Regional Development Agencies' enforced in February 2006) will take action to develop and implement a regional dimension of innovation policy in Turkey. Two regional innovation-related projects started with the support of the EU under the FP6 in Mersin and Adana regions help create awareness on regional innovation policy (see Sections 1.3 and 1.4 for details).

2.3.2 Regional Theme: Cluster Policies

The large majority of all clusters we currently observe have developed without the help of any designated policies intended to create them. Given the mounting evidence that such clusters make a positive contribution to regional performance where they exist, pressure is increasing to design policies that can foster the development of clusters or increase their economic benefits.

For this study, we define cluster policies as policies that fall into one of the following two categories:

- *Cluster development policies directed at creating, mobilising, or strengthening a particular cluster*, e.g. a national funding competition for the best life science cluster strategies
- *Cluster leveraging policies that use a cluster lens to increase the efficiency of a specific instrument*, e.g. an R&D subsidy provided only to companies in regional clusters where the subsidy is likely to incur spill-over effects beyond the recipient firm.

In order to understand 'policies' better, we will use two different terms:

1. *Policy*; Often, governments set out their strategic intentions in a specific document, a policy (or white paper). This document does not have to define specific tools, allocate funding, or create responsibilities, but it does set the political objectives and present the motivation of why specific activities in the direction described are deemed important. An example is the Swedish National Innovation Strategy.
2. *Programme/innovation policy measures*; To move from intent to real action, governments then design specific programs or policy measures, in Sweden for example Vinnväxt, that allocate funding, create organisational responsibilities, and define specific conditions under which funding can be made available.

Cluster policies and programmes

On the policy level, plans and strategies are developed in the form of policy documents, directives and legislation, rather than concrete programmes and organisations.

There may be one overarching policy for clusters, a "cluster policy", outlining specifically how cluster development should be pursued. In addition, clusters may form a framework in a long range of policy fields. Primarily, this is often the case in three key areas: innovation and technology policies, regional economic development policy, and entrepreneurship/SME policy. However, it can also occur in many other policy areas.

In many countries, there are programmes set up specifically to promote cluster development. Such programmes can be carried out by existing actors (for example a government agency), or new actors

can be set up to run them. This year's theme will provide an overview and analysis of the existing mix of cluster policies and programmes in Turkey at national and regional level.

Although currently there are no cluster policies, policy papers and explicit cluster policy measures at the national or regional level, there are several cluster initiatives introduced. While the number of clustering initiatives is limited, the concept is quite popular thanks to visibility of the clustering initiatives launched within the scope of EU-funded projects. The EU-funded technical assistance project for the establishment of a 'Fashion and Textile Cluster' is by far the most ambitious clustering initiatives in Turkey. Smaller clustering initiatives have also been conducted in Southeast Anatolia under the EU-funded GAP-GIDEM Project, and in other parts of Turkey. All these clusters have a technical base which includes cluster mapping which will be used in the cluster policy development project mentioned below.

The "Development of a Clustering Policy in Turkey Project" has recently been initiated by the DTM with the support of the EU. The project addresses the 16th chapter of the National Programme for the Adaptation of *Acquis* and falls mainly into priority 16.2, namely "Implementation of SME Strategy and Action Plan". The project is geared towards improving competitiveness of SMEs, hence serves directly to the achievement of the overall objectives of broader policies including the national SME Strategy and Action Plan and national development plan. Several strategic areas of the SME Strategy and Action plan will be addressed by the project: For instance, the clusters contribute to the competitiveness of SMEs by lowering transaction costs; helping them develop new skills specifically in the areas of R&D (8th strategic area of the strategy and action plan), facilitating the exploitation of synergies to generate solutions for, and overcome common problems such as market entry (6th strategic area), lack of soft/hard infrastructure (9th strategic area), unqualified labour (4th strategic area), etc. Successful clustering policies also improve the communication channels between market and policy makers, and thereby contribute to the establishment of a better business environment, including development of market-friendly legislation (3rd strategic area). In addition, the project will support achievement of objectives of the Exports Strategic Plan prepared by the DTM by developing institutional capacity to improve competitiveness of Turkish clusters.

The overall objective of the project is to improve the competitiveness of Turkey in international markets by exploiting the synergies between Turkish and European clusters and thereby to contribute to the EU's Lisbon Strategy. The purpose of the project is to develop a comprehensive and visionary clustering policy that contributes to the sustainable social, environmental and economic development of Turkey. In the first phase of the project, it will be tried to map the clusters in Turkey to see the regional economic concentrations and then prioritise 20 clusters, 10 of which will be supported in terms of investment and technical assistance in the second and third phases of the programme. 'Which cluster categories (or industries) will be supported in the following phases' is a question that will be answered when the prioritisation tasks in the project are finalised. Therefore, the clustering approach brings many advantages for the companies involved at the micro level, while the macro effects of the policy will be more competitiveness and higher exports for Turkey.

The DTM is the beneficiary of the clustering project. However, since the project covers an important aspect of industrial policy, the participation and commitment of the other stakeholders will be ensured and a thorough stakeholder analysis will be carried out in the project. After this analysis, the necessary tools will be used effectively to implement the project in a participatory and systematic manner¹⁹.

Clusters as framework in three key policy areas

Although in some countries or regions there is no clear cluster strategy, the corresponding authorities may use a number of instruments available in other policies such as in the industrial and SME policy, R&D policy or regional policy, in order to strengthen cluster development in their territories.

The current innovation strategy and the implementation plan of science and technology policy do not make a specific mention to clusters. On the other hand, both policies attach importance to the

¹⁹ Information on the cluster policy project draws on the note prepared by Mr. Yasin Turkcan from DTM. Further information is available at http://ec.europa.eu/enlargement/fiche_projet/document/PF%202005%2002.07%20Clustering%20Policy.pdf

development of technology parks and incubators to enhance the competitiveness of the private sector. Moreover, the 'Technology and Innovation Support Programmes Regulations' of TUBITAK issued in January 2007 foresees to support clustering activities, among other things. As mentioned above, it is possible to support cluster development projects under ISBAP.

The Ninth Development Plan, which, at the same time, highlights the regional development policy lines, emphasises cluster development. It is stated that during the next five years, support for clustering under the leadership of driving sectors will be ensured within a strengthened social network. In this framework, creation of mechanisms, which will support local clusters, increase collaboration among the agents included in these clusters and ensure their integration with global markets, will be encouraged²⁰.

The current SME Strategy and Action Plan and the Industrial Policy attach importance to cluster development as well. SME Strategy and Action Plan were formulated in line with the priority areas of the 'European Charter for Small Enterprises' and national priorities and outline measures for improving the business environment for SMEs and enhancing their competitiveness. The SME Strategy and Action Plan are considered to be the guiding documents for the projects to be financed by Pre-accession Financial Assistance. Both this strategy and the Industrial Policy foresee to support the creation of local and regional clusters and communication networks shall be promoted, and adopting new strategies to foster cluster development in organised industrial zones, industrial zones and industrial estates²¹. KOSGEB is in the process of updating the SME strategy, which is expected to be issued by mid-2007, and cluster development will be given a higher emphasis in the new strategy.

As clustering is fairly new concept for Turkish institutions and as there is no explicit clustering policy at present, clusters are not used as a framework in policy areas other than those mentioned above.

²⁰ Ninth Development Plan (2007-2013) <http://ekutup.dpt.gov.tr/plan/ix/9developmentplan.pdf>

²¹ SME Strategy and Action Plan, and Industrial Policy for Turkey (Towards EU Membership), DPT

3. Main Policy Challenges in the National Innovation System

3.1 Main Policy Challenges in the National Innovation System

The main challenges for Turkey are identified on the basis of the fact that the country needs to focus on input innovation drivers and knowledge creation to be able to increase the innovation performance of the private sector. The EIS is of very limited use in the identification of the challenges due to the very poor availability of data for Turkey.

An important challenge to be addressed is to increase the investments in human resources for innovation. Turkey needs a further increase in the quantity and quality of tertiary level education to develop human resources for innovation. According to the 2005 EIS results, the country has low rates in terms of population with tertiary education, with only 46 percent of the EU average. In spite of the increase in tertiary education enrolment rates in recent years (from 13 percent in 1990-91 to 25 percent in 2002-03) Turkey still ranks last out of the 34 countries covered by the EIS. The number of science and engineering graduates is also low. Although there is no data for the previous years, the number of science and engineering graduates in Turkey only reached 43 percent of the EU average in 2003. In addition, according to the World Bank Country Economic Memorandum, while the enrolment ratio in science and engineering schools is high in Turkey (and above its main competitors), Turkish business executives and entrepreneurs consider the quality of science and engineering schools as rather low.

Another key challenge facing the innovation system in Turkey is to enhance university-industry co-operation. Establishing strong linkages between the private sector and the research community is critical for Turkey as most R&D is performed by universities (universities account for 58.9 percent of the country's R&D expenditure, employ 73.2 percent of researchers and produce a high level of scientific output which is not sufficiently transformed into innovation). The report "Monitoring and Evaluation of the Industrial Technology Project"²² indicates that only 18 percent of firms involved in World Bank financed R&D support schemes have requested cooperation with research centres or universities in 2001 (up from 16% in 1998). The Ninth Five-Year Development Plan (2007-2013) also highlights the weaknesses in the university-industry links. In the plan it is stated that the weak links between knowledge producers and knowledge users hamper the transformation of R&D results into commercial values or lead to research activities which do not respond the needs and demands of industry.

Finally, increasing early stage funding is an important challenge facing the innovation and economic performance of the country. The underdeveloped venture capital and business angels market is a crucial impediment for the creation and development of innovative businesses in Turkey. Total fund size for venture capital and private equity is estimated around €400 million and annual investments are not more than €100 million. Only a few of these investors prefer to invest in small and medium companies and almost none of them chose to make early stage investments. Similarly, business angel investments are low and the lack of business angels networks prevents entrepreneurs' access to such finance options. Insufficient early stage funding is an obstacle for the development of venture capital industry as it helps generate a large deal flow for venture capital investments.

²² Taymaz, E. "Monitoring and Evaluation of the Industrial Technology Project, Second Report 2003"

Exhibit 12: Main innovation challenges

Description of challenge	Relevant indicators and trends
<p>1. Increasing investments in human resources for innovation: Although tertiary education enrolment rates have increased in recent years (from 13% in 1990-91 to 25% in 2002-03) Turkey remains in last position out of 33 countries. Furthermore, according to the World Bank Country Economic Memorandum, while the enrolment ratio in science and engineering schools is comparatively high, Turkish entrepreneurs consider the quality of science and engineering schools rather low. In spite of measures to improve the education system, investment in human resources for innovation remains an important challenge for Turkey, which needs to be addressed by increasing public expenditures and stimulating private expenditures for the creation of new universities, by revising university admission requirements and by updating the curricula in co-operation with the private sector in a way that the skills of university graduates match the needs of the business community.</p>	<p><i>Population with tertiary education:</i> Turkey has low rates in terms of population with tertiary education, with only 46 percent of the EU average. However, the EIS trends over the last five years are positive.</p> <p><i>S&E graduates:</i> Although there are no data for the previous years, the number of science and engineering graduates in Turkey only reached 43 percent of the EU average in 2003.</p> <p><i>Higher education and training:</i> According to WEF 2006 Global Competitiveness Index, Turkey ranks 57th in higher education and training which is defined as one of the basic requirements for competitiveness.</p>
<p>2. Enhancing university-industry co-operation: Increasing university-industry collaboration in Turkey is critical as most R&D is performed by universities. Research-industry linkages are traditionally weak and incentives and measures to stimulate collaboration are insufficient. There is a need to revise university regulations and legislation in order to encourage collaboration with the private sector. Furthermore, incentives to raise demand from the industry sector and more intermediaries are required.</p>	<p><i>Public R&D expenditures and business R&D expenditures</i> This indicator is one of the few high score indicators in the EIS 2006 (0.48% in 2002). It also shows a positive trend for public R&D expenditures (from 0.34% in 1998 to 0.48% in 2002). However, business R&D expenditures are low and show a declining trend.</p>
<p>3. Increasing early stage funding: The underdeveloped venture capital and business angels market is a crucial impediment for the creation and development of innovative businesses in Turkey. Only a few of the existing investors prefer to invest in small and medium companies and almost none of them chose to make early stage investments. Similarly, business angel investments are low and the lack of business angels networks prevents entrepreneurs' access to such finance options. Insufficient early stage funding is an obstacle for the development of VC industry as it helps generate a large deal flow for venture capital investments.</p>	<p>The data for 'early stage venture capital' indicator in EIS for Turkey is missing. However, it is known that there are only three registered venture capital companies and none of them prefer to invest in early stage businesses. Total fund size for venture capital and private equity is estimated as around €400 million and annual investments are not more than €100 million.</p>

3.2 Policy Responses to Identified Challenges

As noted in section 3.1 above, the main challenges for Turkey relate to input innovation drivers and knowledge creation and are closely related to the ability to create an innovative private sector. The challenges are to increase investments in human resources for innovation, to enhance the university-industry co-operation and to increase early stage funding.

Various government policy documents and national objectives and targets for science, technology and innovation policy address these challenges (see section 2.2.1), as does a number of concrete measures highlighted below. However, much remains to be done before the targets can be reached.

Exhibit 13: Innovation challenges and policy responses

Key challenge	Measures responding to the challenge
1. Increasing investments in human resources for innovation	Industrial Thesis (San-Tez) Projects (TR 32) (the ‘Technology and Design’ programme which covers a module on innovation and is being taught at the secondary education level should also be mentioned as a measure contributing to address this challenge).
2. Enhancing university-industry co-operation	Establishment of Technology Development Centres (TEKMERS) (TR 03), Support for establishment of technology parks (the Law on Technology Development Zones) (TR 18), Industrial Thesis (San-Tez) Projects (TR 32), Joint Technology Development Projects (TR 34), Scientific and Technological Cooperation Networks and Platforms Support Programme (ISBAP) (TR 38)
3. Increasing early stage funding	New Entrepreneur Support (TR 23), Pre-Incubation Support Programme (TR 39), Start-up Support (TR 41), Risk Sharing Facility Support (TR 42), Support Programme for Technology- and Innovation-focused Entrepreneurship (TR 43)

Challenge 1: Increasing investments in human resources for innovation

This challenge is discussed widely in policy circles and is on the agenda of various bodies (such as TUBITAK, which intends to take steps to improve university regulations and implements some measures to develop human resources for research (e.g. the “National Young Researcher Career Development Programme”, see ERAWATCH research programmes for Turkey)). However, there is limited number of measures to respond this challenge. One of the developments in this respect is that a bill accepted by the Parliament in 2006 paved the way for 32 new state universities to become effective soon. Majority of these new universities are being created by making necessary changes in some of the existing vocational high schools. Further action is needed to upgrading the curricula of universities and vocational schools according to the needs of the business community.

Challenge 2: Enhancing university-industry co-operation

The old measures listed above have successfully stimulated cooperation between firms and the research community and have yielded some positive results. Additional steps were taken by introducing new measures (also see Section 2.2.3). It is expected that these new measures will contribute to the efforts taken to strengthen the links between the research community and the private sector and commercialisation of research results. On the other hand, it is crucial to take actions to improve the framework conditions and to help development of new structures to bridge the gap. Such actions would include, among others, increasing the number and quality of intermediaries to improve

communication and co-operation between the private sector and the universities, revising university regulations and legislation to encourage collaboration with the private sector and providing incentives for more demand from the industry. In addition, further efforts are required for the development of clusters involving companies and the research community to contribute to the regional development.

Challenge 3: Increasing early stage funding

Until last year, there was only one measure to provide finance for early stage businesses while a few others were tried as pilot and then abandoned without leading to any concrete results. Four new measures were launched over the past year to address this challenge. Moreover, the European Investment Fund, together with the local actors like KOSGEB and TTGV, aims to create a fund of funds programme for Turkey. In spite of these developments, very limited actions were taken to improve the framework conditions which are crucial to develop the Turkish venture capital industry. For instance, current venture capital regulations and other related legislation should be benchmarked and revised according to international best practices. Tax issues in the venture capital and business angels investments should be reviewed and required steps should be taken to improve the conditions. The supply and demand side problems that prohibit the uptake of venture capital should be dealt with through a strategy to create a culture open to venture capital investments among the entrepreneurs, and mobilise institutional and private investors to invest in venture capital. In addition, establishment of local, regional and sectoral business angels networks, as well as a national BAN association should be encouraged in line with the best practice standards.

Exhibit 14: Innovation challenges, policy responses and impact

Challenge	Relevance of policy response (1-5)	Evidence of impact (1-5)
Increasing investments in human resources for innovation	2	3
Enhancing university-industry co-operation	3	3
Increasing innovation activities of the private sector	3	3

Policy response ranking scored from 1 to 5: (1) No specific measures addressing the challenge (possibly a debate but no evidence of any real policy development); (2) Policy development under way to respond to challenge (policy debate or design launched, e.g. announced in National Lisbon Reform Plan, etc.); (3) Specific measures existing for some time but insufficient to respond fully to challenge; (4) Existing measure plus one or more newly launched measures (during last 18 months); (5) A comprehensive set of measures which potentially responds fully to the challenge

Evidence of impact scored from 1 to 5: (1) Trend for indicators has worsened since measure(s) introduced; (2) No observable change in trend since measure(s) introduced; (3) Too early to appraise (measures introduced in last 24 months); (4) Trend for indicators has improved since measure(s) introduced; (5) Evaluation or study indicates measure(s) has clearly contributed to improving performance of country.

3.3 How well does Policy meet the Innovation Challenges?

Assessing the effectiveness of national innovation policy with respect to innovation performance is anything but a straightforward exercise. There are at least two main problems:

- First, there is an information problem. To answer the question, information is required on intended and unintended changes in innovation behaviour of economic actors as a result of certain innovation policy measures and the (dynamic) impact of changed behaviour on the performance of both the direct target group of a measure and other economic actors (through positive and negative externalities, forward and backward linkages, macroeconomic relations, consequences upon market structures and competition etc.). Evaluation methodology has developed different approaches to tackle these challenges, ranging from qualitative ones (like peer review and systemic analyses) to quantitative modelling. Existing methodologies and data availability allow meaningful evaluations of individual schemes, especially with regard to the intended changes in behaviour and performance of the target group. Such evaluations have been carried out for a number of measures, and their results may be used to assess the effectiveness of innovation policy on the level of individual measures.

- Secondly, there is the problem of attribution. National innovation policy is only one area of policy making that influences innovation performance. A number of innovation activities are affected by European TrendChart on Innovation policy measures designed on an international or multinational level, such as EU Framework programmes, EU regulations, agreements on trade and intellectual property in the framework of WTO, etc.). As innovation policies on the national and international level are interconnected, a purely national view on the link between innovation policy and innovation performance is therefore incomplete.

Given these limitations, this section of the INNO-Policy TrendChart report focuses on exploring three key issues:

- 1) The relevance and timeliness of the policy response to the challenge identified in this report
- 2) The relevance and timeliness of the regional policy response to the challenges
- 3) Available evidence on the influence of policy measures on innovation performance

With the introduction of new policy measures during the past 12 months, the policy mix now better addresses the key challenges in the Turkish Innovation System. The creation of 32 new universities and integration of innovation in the compulsory education programme are important steps for meeting the challenge of 'increasing investments in human resources for innovation'. Three new schemes aiming (Industrial Thesis (San-Tez) Projects (TR 32), Joint Technology Development Projects (TR 34), Scientific and Technological Cooperation Networks and Platforms Support Programme (ISBAP) (TR 38)) to address the challenge of 'enhancing university-industry co-operation' complement the measures stimulating transfer of technology from science to enterprises. Addition of four new measures to the policy mix is an indication of increasing interest of the policy makers in the challenge of 'increasing early stage funding'. As noted in above section 3.2, the policy mix should be continued to be enriched with new measures approaching the challenges from various angles.

In the case of Turkey, since there is no regional approach to innovation policy it is not possible to appraise the extent to which the current policy mix at the regional and national level seems to be balanced, complementary or counter-productive.

As for the evidence on the influence of policy measures on innovation performance, the results of evaluation indicates that beneficiary companies have increased their R&D expenditures, productivity, output and exports. The measures also helped those companies to enhance skill base and establish or strengthen linkages with the research community (see Section 4.1 below). In addition, it is observed that the innovation policy measures contribute to the development and dissemination of an R&D and innovation culture in the industry. However, it should be noted that the formal evaluation has been conducted for the World Bank financed measures only and the evidence on the influence of those aiming to address above mentioned challenges are very limited.

4. What lessons can be drawn from Policy Implementation?

4.1 Lessons from the Evaluation of Innovation Policy Measures

Although an 'evaluation culture' in the field of technology and innovation policy in Turkey has started to develop (since early 2000 and largely as a result of the requirements of programmes supported by the World Bank), it has not been pursued by the authorities in a systematic and continuous manner. Thus, for most policy measures, important questions on additionality, quality and efficiency remain unanswered. Such information is, however, at least partly available for programmes financed through the World Bank.

In general, the responsiveness of the respective target groups to the support measures is quite low (e.g. absorption of available grant funding by SME and the rate of coverage of the target group). There are three main reasons for the low demand: the low priority attached to R&D and innovation in the private sector, (also linked with this fact) low awareness on available support schemes, and the implementation conditions of the measures. As a result, the policy measures do not contribute adequately to the overall objectives (such as to increase business expenditure in R&D and the competitiveness of SMEs).

Nevertheless, direct innovation measures (particularly those implemented by TUBITAK-TEYDEB, TTGV and KOSGEB) have contributed to the development of an R&D and innovation culture in the private sector and the supported companies have developed a better competitive position.

On the other hand, the problems faced during the implementation phase of measures create major obstacles for responding to the needs of the target groups. Formal evaluations show schemes require the applicants to go through lengthy, time consuming and bureaucratic processes during the application and implementation phases of their project. On the other hand, some implementing agencies like KOSGEB have noted improvements as processes were simplified and the number of documents required from the applicant reduced. TUBITAK has also improved the project support processes with a regulation issued in January 2007.

An independent ex-post evaluation of policy measures which were financed by the World Bank (under the Industrial Technology Project (ITP)) was carried out last year as required by the Bank. The evaluation results indicated that the beneficiaries of the ITP increased their productivity by 11 percent on average and their output by 6-10 percent. 80 percent of firms introduced new products and processes. The R&D expenditures of beneficiaries increased by an annual compound growth rate of 34 percent (40 percent for SMEs that were supported by the ITP). A 20 percent annual growth rate was observed in exports by the firms supported under the ITP. The programmes evaluated also helped create synergies between industry and research community and enhanced skills base in firms and technology institutions. On the other hand, the evaluation revealed certain problems faced by participating companies. For instance, TTGV clients, almost at equal proportions, stated that high loan costs (31.5 percent), sufficient own resources (27.4 percent), and inconvenience of getting TTGV support (26.2 percent) were the main reasons for not applying for TTGV for other R&D projects. Technological aspects of MAM and UME services were valued favourably, but their costs were considered to be quite high as well.²³

The findings of the evaluation imply that TTGV could consider moving into complementary stages with other public funds such as those TEYDEB, start-up support and commercialisation support. Considering these needs, TTGV has introduced four new schemes (TR 33, TR 39, TR 41 and TR 42) (see Section 2.2.3 for details).

²³ Taymaz E, An Assessment of the Industrial Technology Project Final Report, 2006

4.2 Review of Good Practice

Good practice examples for Turkey have only been identified in 2005. The Vision 2023 initiative was designated as an example of good practice in innovation governance as it led to a new approach to science and technology policy making in Turkey by ensuring the involvement of the largest stakeholders, increased political commitment and an evidence-based approach with clearly identified priorities. A good practice example in policy implementation is the University-Industry Joint Research Centres Programme (USAMP), which helps the creation of research and innovation intermediaries between universities and private sector. Over the past 12 months, the positive impact of the Vision 2023 project has continued and is particularly reflected in the increased political commitment in science and technology. USAMP which helped establishment of joint research centres by a triple helix model of university-industry-government interactions was abolished by the end of 2006. Six USAMs established so far were restructured as companies and applied to the TUBITAK's new programme which aims to support projects targeting to establish scientific and technological collaboration networks and platforms (ISBAP) (see Section 2.2.3).

Exhibit 15: Summary of good practice cases in Turkey

Year	Title of good practice case	Justification for selection
2005	Vision 2023 (TR 20)	The lack of a shared vision of and commitment to the NIS has always been the major obstacle for Turkey in terms of the design and implementation of science, technology and innovation policy. The Vision 2023 Project (TR 20), which was implemented between 2002 and 2004, helped address this problem by ensuring the involvement of larger stakeholders from the public and private sectors, academia and non-governmental organisations. The project has resulted in new science and technology strategies which were developed as a result of the first technology foresight exercise ever in Turkey. Moreover, the foresight process was so successful that TUBITAK, the coordinator of the study, started to transfer experience and knowledge to the other countries
2005	University-Industry Joint Research Centres Programme (USAMP) (TR 07)	As noted in various sections of this report, co-operation is one of the main cultural weaknesses of Turkish innovation system. Another important weakness is that capacities to transfer applied knowledge to innovation are low. To address these issues as well as to increase the R&D activities of the private sector, TUBITAK-TEYDEB launched the USAMP initiative (TR 07) in 1996. The measure foresees a "Triple Helix" model of university-industry-government interaction to promote innovation. The centres are the most effective structures fulfilling their intermediary functions in bridging the gaps between the research and industry.

Examples of good practice identified in other countries could be used to design new innovation policy measures responding to Turkey's current challenges. In particular, examples of measures implemented to encourage co-operation between companies and of universities with industry and to stimulate innovation activities of the private sector could be used to inspire the development of similar measures in Turkey. For this purpose, the following TrendChart measures were identified:

- The Higher Education Innovation Fund (HEIF) (UK 38) which incorporates funding for activities previously supported by three different policy measures and includes a third mission to encourage universities to work with industry and the wider community alongside their teaching and research activities in the UK.²⁴
- The Small Business Research Initiative (UK 46,) which is based on a highly successful US scheme (Small Business Innovation Research Programme) to open up government research and development procurement to small enterprises.²⁵
- The TULI Programme (FI 6) of Finland, which is financed by TEKES and aims to create awareness on commercialisation of research outputs at universities and R&D institutes with a

²⁴ See <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=7759&CO=18>

²⁵ See <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=7761&CO=18>

view to promote new, technology-based businesses coming from applied research in Finland.²⁶

- The YOZMA initiative (IL 03), which was established in 1991 to trigger a domestic venture capital industry and has been very successful as it led to the foundation of ten venture capital funds. Before its privatisation, it raised €228 million in Israel, a country where venture capital was virtually nonexistent in 1990.²⁷

²⁶ See <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=7834&CO=4>

²⁷ See <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=6172&CO=10>

5. The Lisbon National Reform Programme (NRP) and innovation: an appraisal

There is no National Reform Plan for Turkey and the rules do not foresee that Turkey submits one. The following exhibit shows a list of measures contained in the TrendChart Knowledge Base that are relevant to the Lisbon Guidelines n°8 and 15.

Exhibit 16: Policy Measures relevant to Lisbon guidelines n°8 and 15.3

Lisbon guidelines n.8 - Innovation	IPM Fiche Number	Title of measure
1. Improvements in innovation support services, in particular for dissemination and technology transfer.	TR 4	Consultancy Support for SMEs
	TR 8	Training Support
2. The creation and development of innovation poles, networks and incubators bringing together universities, research institutions and enterprises, including at regional and local level, helping to bridge the technology gap between regions.	TR 3	Establishment of Technology Development Centres (TEKMERS)
	TR 7	University-Industry Joint Research Programme (USAMP)
	TR 18	Support for establishment of technology parks (the Law on Technology Development Zones)
	TR 38*	Scientific and technological cooperation networks and platforms support programme (ISBAP)
3. The encouragement of cross-border knowledge transfer, including from foreign direct investment.	<i>No measures in this category</i>	
4. Encouraging public procurement of innovative products and services.	<i>No measures in this category</i>	
5. Better access to domestic and international finance.	TR 5	State Support for R&D (grant by TUBITAK-TEYDEB)
	TR 6	State Support for R&D (loan by TTGV)
	TR 15	Support for R&D Investment
	TR 23	New Entrepreneur Support
	TR 33*	Commercialisation Project Supports
	TR 34*	Joint Technology Development Projects
	TR 39*	Pre-Incubation Support Programme
	TR 41*	Start-up Support
	TR 42*	Risk Sharing Facility Support
	TR 43*	Support Programme for Technology- and Innovation-focused Entrepreneurship
6. Efficient and affordable means to enforce intellectual property rights.	TR 9	Industrial Property Rights Support
	TR 44*	Support Programme for Patent Applications

Lisbon guidelines n.15 - Entrepreneurship and SMEs	IPM Fiche Number	Title of measure
3. Strengthen the innovative potential of SMEs	TR 2	Technology Research and Development Support
	TR 16	Machinery/Equipment for Common Use of SMEs
	TR 19	ICT Support
	TR 22	Support for Hiring Qualified Personnel by SMEs
	TR 40*	Support Programme for the First R&D Projects of SMEs

*: New measure

Annex 1: Main National Governance Characteristics and Actors

The BTYK, which was formally established in 1983, determines, directs and coordinates science and technology policies which are the basis of innovation policy. The Council decides on the policies designed and proposed by TUBITAK; approves the action plan for implementation of the policies; assigns the responsible bodies and coordinators for each policy measure and follows up and coordinates the implementation of policy actions.

The BTYK is headed by the Prime Minister. Members include the concerned State Ministers; the Ministers of Communication and Transportation, Energy and Natural Sources; Defence; Finance; National Education; Health; Environment and Forestry, Agriculture and Rural Affairs; Industry and Trade; the President of the Council of Higher Education; the Under-Secretaries of the State Planning Organisation; Treasury, and Foreign Trade; the President and one of the Vice Presidents of TUBITAK; the President of the Atomic Energy Council of Turkey; the General Director of the Broadcasting Corporation of Turkey; the President of the Union of Chambers and Commodity Exchanges of Turkey (TOBB), and the representatives of two leading universities. Relevant stakeholders, such as the presidents of other related governmental bodies, not-for-profit foundations, chambers and major technical universities are invited to the meetings.

Being the highest level body dealing with science, technology and innovation, the BTYK has a very strong influence on government decisions concerning innovation policy. All innovation measures, such as the law on technology development zones and the state support for industrial R&D are the result of decisions of the BTYK. On the other hand, not all policy actions and decisions of the BTYK have been implemented, mainly due to insufficient commitment to innovation by different governments.

The other main players in innovation policy making are the State Planning Organisation (DPT) and its two operational arms, the High Planning Council (YPK) and the Money-Credit and Co-ordination Council (P-KKK). The YPK is the highest level authority for the preparation and implementation of the development plans. The DPT acts as secretary to the YPK which is chaired by the Prime Minister and composed of the ministers appointed by the Prime Minister and the Under-Secretary of the DPT. The P-KKK is responsible for the determination of policies for state support programmes and allocation of funds for this purpose. It is chaired by the State Minister for DPT, consists of the ministers appointed by the Prime Minister as well as the Under-Secretaries of the Ministry of Finance, the DPT, Foreign Trade and the Treasury, as well as the Governor of the Central Bank.

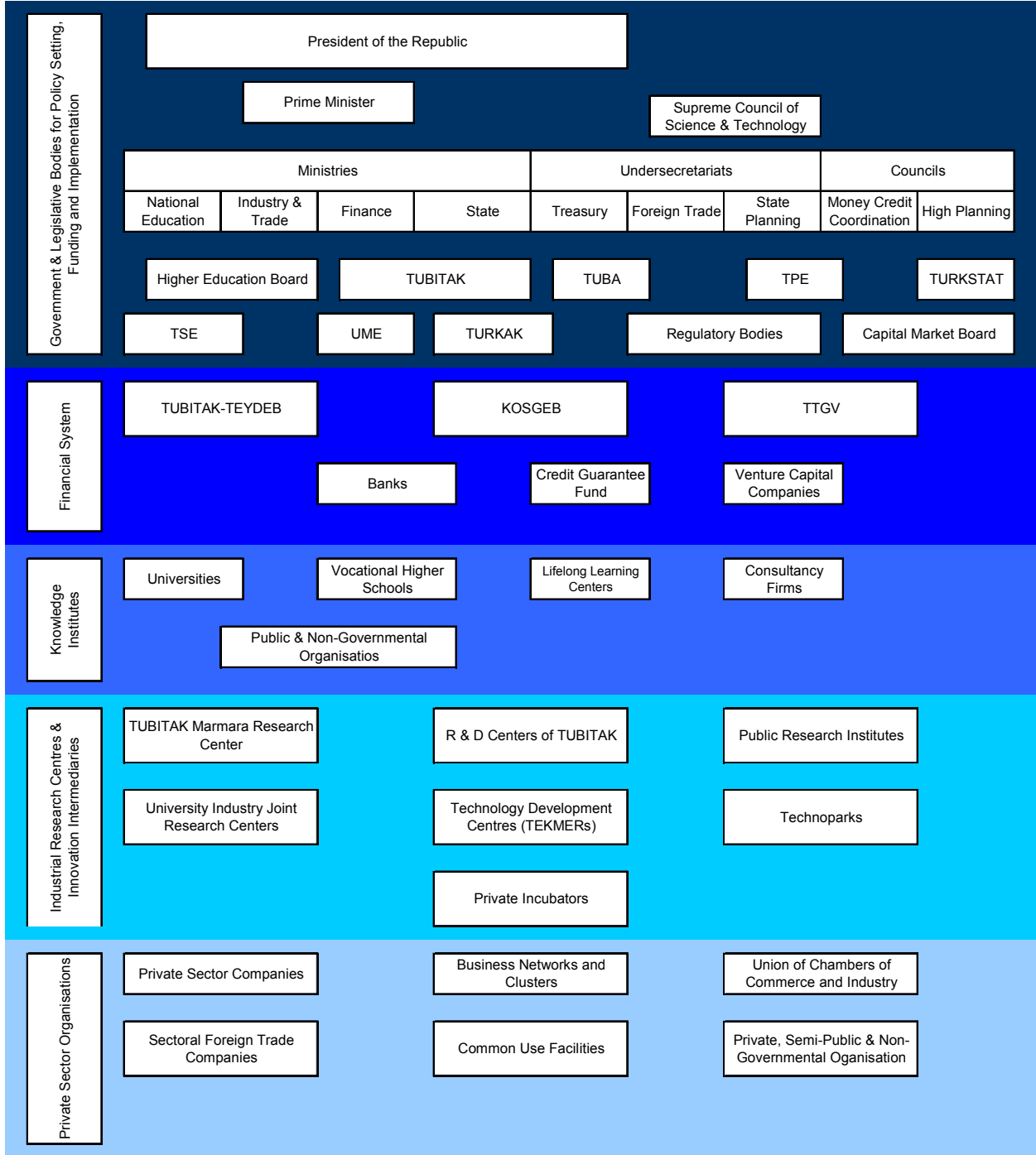
The Under-Secretariat of Treasury (HM) and Under-Secretariat of Foreign Trade (DTM) are actively involved in the formulation of policies in connection with the design of innovation measures. The Small and Medium-Sized Industry Development Organisation (KOSGEB) plans and proposes policies aimed at increasing the competitive advantage of SMEs and developing entrepreneurship. The Turkish Academy of Science (TUBA) is responsible for determining and recommending scientific priority areas and proposing legislations to the Government on the issues related to scientists and researchers. The Ministry of Education and the Council of Higher Education (YOK) are other key players in innovation policy making as they design and implement the education and training policies.

The main organisations responsible for implementing innovation policy include TUBITAK-TEYDEB, TUBITAK-MAM, TTGV, KOSGEB, TPE, TURKAK and UME. TUBITAK-TIDEB provides grants for industrial R&D (TR 05) and manages the university-industry joint research centres (USAMP) (TR 07) and EUREKA programmes, among other activities. In addition, they assist the Ministry of Finance in the implementation of tax incentive measures (TR 30) and the HM in carrying out the R&D investment incentive (TR 15). R&D project support activities of TUBITAK-TEYDEB are funded by TUBITAK and DTM, and the USAMP programme is financed out of TUBITAK's annual budget. In addition to full-time staff, TUBITAK-TEYDEB has a pool of 1200 experts to evaluate and monitor R&D projects of the private sector.

TUBITAK-MAM provides the industry with contractual research, testing, training, consultancy, analysis and certification services in its research centres and creates an environment for the generation and growth of high-tech firms in its techno-park. TTGV is a not-for-profit foundation managing R&D support programmes through the finance provided by DTM (TR 06). They also have a pool of 1500 experts for project evaluation and monitoring. KOSGEB is an autonomous public body implementing support programmes for SMEs and providing an environment for establishment of high-tech firms through its TEKMERs. In addition to its main office, KOSGEB has 16 TEKMERs, 25 regional offices and ten laboratories.

TPE is an autonomous body affiliated to the MoIT and is responsible for carrying out the procedures related to industrial and intellectual property rights and for informing and guiding industrialists, R&D institutes and individuals on IRP related issues. TURKAK is also an autonomous affiliate of the MoIT intending to increase the level of industrial competitiveness through accreditation and ensuring that accredited organisations operate in accordance with national and international standards. Established as one of the institutes of TUBITAK, UME provides measurement, training, consultancy, information dissemination and infrastructure support services to the industry.

Exhibit A1 Organisational Chart of the National Innovation Governance System



Annex 2: Main Regional Governance Characteristics and Actors

In spite of the high regional disparities and uneven distribution of industry between the regions in Turkey, regional innovation policies and systems are underdeveloped. However, as an important requirement for the accession to the EU, the government started to attach increased importance to regional development.

While there is no mention on the regional innovation in the National Innovation Strategy (2008-2010) issued by TUBITAK, the Ninth Five-Year Development Plan highlights developing some elements of regional innovation systems, such as the identification and support of innovative sectors in regions, and investments in regional innovation infrastructures.

An important development in this area was the adoption of new legislation for the decentralisation of governance. For this purpose, the 'Law on the Establishment, Coordination and Duties of Regional Development Agencies' was enforced in February 2006. The law incorporates significant details for the development and governance of regional innovation systems. According to the law, the duties of the regional development agencies include (among others):

- Implementing and supporting research for the identification of the natural, economic and human resources and increasing economic development and competitiveness of the region,
- Promoting the business and investment potential of the region at national and international levels in co-operation with the relevant institutions,
- Supporting small and medium sized enterprises and start-ups in terms of management, production, promotion, marketing, technology, finance, organisation and human resources training in co-operation with relevant institutions,
- Promoting activities in bilateral or multinational programmes in which Turkey participates in the region and contributing to the efforts of project development in that respect.

The co-ordination and the catalytic role of the agencies at national level are carried out by the DPT. In addition, as an important component of the organisation of regional development agencies, the law envisages the establishment of investment support offices in each region to provide mentoring and coordination services to potential investors.

Two pilot regional development agencies started to be established in 2006 in Izmir and Cukurova (Adana and Mersin) regions. The constitutional consultation is conducted for the process for the finalisation of their establishment as well as for creating other RDAs.

In the meantime, the first regional innovation strategies project of Turkey is currently carried out in Mersin through the support of the EU under the Sixth Research Framework Programme (FP6) (www.ris-mersin.info). Another project dealing with the question of the optimisation of the regional innovation system is implemented in Adana again under the FP6. Both Adana and Mersin are covered by one of the two pilot regional development agencies and it is expected that these projects help bringing regional innovation policies in the agenda of the agencies.

Exhibit A2: Regional governance of innovation policy

Level of regional/local government	Legislative &/or administrative authorities	Powers related to innovation policy, if any
<p>There are 81 provinces and 850 towns with local administrations in Turkey.</p>	<p>The Turkish government aims to create 26 "Regional Development Agencies", covering all NUTS2 regions (however the constitutional consultation is conducted for the process of creating RDAs)</p>	<p>The innovation-related duties of the regional development agencies, as defined by the law, include :</p> <ul style="list-style-type: none"> - Implementing and supporting research for the identification of natural, economic and human resources, and increasing the economic development and competitiveness of the region - Promoting the business and investment potential of the region at national and international level in co-operation with the relevant institutions - Supporting small and medium sized enterprises and start-ups in terms of management, production, promotion, marketing, technology, finance, organisation and human resources training in co-operation with relevant institutions - Promoting activities in bilateral or multinational programmes in which Turkey participates in the region and contributing to the efforts of project development in that respect.

As underlined above, there is no regional approach to innovation policy in Turkey. The RIS Mersin project initiated by the local actors and supported by the FP6 is the only attempt to developing regional innovation strategies. The project is implemented with the leadership of Governorship of Mersin by the Mersin Chamber of Commerce and Industry, Mersin University and Mersin Organised Industrial Zone under the coordination of the technology park of the Middle East Technical University. The EU RIS methodology is applied in the project. In 2007, it is planned to finalise the regional innovation strategy which was drafted and opened to public consultation in late 2006 and implement four pilot projects (aiming to increase (a) R&D activities, (b) number of innovative entrepreneurs, (c) quality foreign direct investment, and (d) rate of export).

Annex 3: Dominant Regional Innovation Systems in the Country

As noted above, currently there is not a regional governance approach related to innovation and the only efforts being taken to establish the regional innovation systems are observed in Mersin and Adana due to two ongoing FP6 financed projects. To this end, it is only possible to identify the regional innovation systems in these two regions.

Exhibit A3.1: Selected key organisations within the dominant regional innovation systems in the country

Regional system 1: Mersin

Regional system	Name of organisation (in English)	Website (where available)
Geographical coverage: Mersin province		
Government/county/municipality bodies		
1. Government	Governorship of Mersin	www.mersin.gov.tr
2. Municipality	Mersin Municipality	www.mersin.bel.tr
3. Public	Cukurova Development Agency	www.cka.org.tr
Private sector organisations and entrepreneurship promotion		
1. NGO	Mersin and Tarsus Business Incubation Centres	www.kosgeb.gov.tr
2. NGO	Mersin Organised Industrial Zone	www.mtosb.org.tr
Knowledge institutes (R&D and education bodies)		
1. University	Mersin University	www.mersin.edu.tr
2. University	Cag University	www.cag.edu.tr
Industrial research centres and innovation intermediaries		
1. NGO	Mersin Chamber of Commerce and Industry	www.mtso.org.tr
2. NGO	Businessmen and Industrialists Associations	
3. Private	Mersin Technology Development Zone (TechnoScope)	www.technoscope.com.tr
4. Public	Provincial Directorate of Small and Medium Industry Development Organisation (KOSGEB)	www.kosgeb.gov.tr

Regional system 2: Adana

Regional system	Name of organisation (in English)	Website (where available)
Geographical coverage: Adana Province		
Government/county/municipality bodies		
1. Government	Governorship of Adana	www.adana.gov.tr
2. Municipality	Adana Municipality	www.adana-bld.gov.tr
3. Public	Cukurova Development Agency	www.cka.org.tr
Private sector organisations and entrepreneurship promotion		
1. Public	Adana Business Development Centre	www.kosgeb.gov.tr
2. NGO	Adana Organised Industrial Zone	www.adanaorganize.org.tr
Knowledge institutes (R&D and education bodies)		
1. Public	Cukurova University	www.cu.edu.tr
2. Public	Public Research Institutes	
Industrial research centres and innovation intermediaries		
1. NGO	Adana University-Industry Joint Research Centre	http://usam.cu.edu.tr
2. Private	Cukurova University Technology Development Zone	http://teknokent.cukurova.edu.tr
3. Public	Provincial Directorate of Small and Medium Industry Development Organisation (KOSGEB)	www.kosgeb.gov.tr
4. NGO	Adana Chamber of Industry and Adana Chamber of Commerce	www.adaso.org.tr www.adana-to.org.tr
5. NGO	Adana Entrepreneur Businessmen's Association	www.agid.net

Annex 4: Overview of innovation policy documents

Main policy documents concerning innovation policy adopted/published since 2006

Title of document (in English)	Date (of approval, publication, etc.)	Organisation responsible (Ministry, etc.)	Legal status (Law, Government Decision, strategy (white) paper, action plan, etc.)
Ninth Five-Year Development Plan	28 June 2006	DPT	YPK Decision
Evaluation and Decisions by the BTYK on the Progress	8 March 2006	BTYK is responsible for follow-up and co-ordination	BTYK Decision
Evaluation and Decisions by the BTYK on the Progress	8 September 2006	BTYK is responsible for follow-up and co-ordination	BTYK Decision
Evaluation and Decisions by the BTYK on the Progress	7 March 2007	BTYK is responsible for follow-up and co-ordination	BTYK Decision

Annex 5: Overview of Innovation Policy Measures

As part of the European INNO-Policy TrendChart on Innovation provides detailed information on policy measures in each country is collected in an online database which can be consulted via the INNO-Policy TrendChart website²⁸. The aim of this section is to provide a succinct overview of the detailed information that is available online for each individual measure.

²⁸ See <http://www.proinno-europe.eu/index.cfm?fuseaction=page.display&topicID=52&parentID=52>

List of Innovation Policy Measure Fiche in the INNO-Policy TrendChart database as of 1 June 2007

Table A5.1: Policy Monitoring framework (2005-2007) objective(s)

IPM Fiche Number	Title of measure	Action plan objective(s) addressed	Start Date	End date	Status during reported period	Evaluated
TR 44	Support Programme for Patent Applications	V.4. Increase the rate of commercialisation/marketing of the results of innovation activity in enterprises	2006	No End Date Planned	New	No
TR 43	Support Programme for Technology- and Innovation-focused Entrepreneurship	IV.1. Increase the number of new innovation intensive enterprises created and their survival	2007	No End Date Planned	New	No
TR 42	Risk Sharing Facility Support	IV.4. Increase the availability of private sector innovation financing to enterprises	2006	No End Date Planned	New	No
TR 41	Start-up Support	IV.1. Increase the number of new innovation intensive enterprises created and their survival	2006	No End Date Planned	New	No
TR 40	Support Programme for the First R&D Projects of SMEs	IV.4. Increase the availability of private sector innovation financing to enterprises	2007	No End Date Planned	New	No
TR 39	Pre-Incubation Support Programme	IV.1. Increase the number of new innovation intensive enterprises created and their survival	2006	No End Date Planned	New	No
TR 38	Scientific and Technological Cooperation Networks and Platforms Support Programme (ISBAP)	I.4. Encourage mutual policy learning and networking between policy-making at regional, national and EU levels	2007	No End Date Planned	New	No
		III.6. Intensifying co-operation between public or higher education research organisations and enterprises on R&D activities				
		III.7. Facilitate the development of collaboration between enterprises and other actors with a view to joint innovation activities and knowledge exchange				

		V.4. Increase the rate of commercialisation/marketing of the results of innovation activity in enterprises				
TR 37	Environmental Technologies Support Programme	IV.4. Increase the availability of private sector innovation financing to enterprises	2006	No End Date Planned	New	No
TR 36	Energy Efficiency Support Programme	IV.4. Increase the availability of private sector innovation financing to enterprises	2006	No End Date Planned	New	No
TR 35	Renewable Energy Support Programme	IV.4. Increase the availability of private sector innovation financing to enterprises	2006	No End Date Planned	New	No
TR 34	Joint Technology Development Projects	III.6. Intensifying co-operation between public or higher education research organisations and enterprises on R&D activities	2006	No End Date Planned	New	No
		IV.4. Increase the availability of private sector innovation financing to enterprises				
		V.4. Increase the rate of commercialisation/marketing of the results of innovation activity in enterprises				
TR 33	Commercialisation Project Supports	IV.4. Increase the availability of private sector innovation financing to enterprises	2006	No End Date Planned	New	No
		V.4. Increase the rate of commercialisation/marketing of the results of innovation activity in enterprises				
TR 32	Industrial Thesis (San-Tez) Projects	III.6. Intensifying co-operation between public or higher education research organisations and enterprises on R&D activities	2006	No End Date Planned	New	No
		IV.4. Increase the availability of private sector innovation financing to enterprises				
		V.4. Increase the rate of commercialisation/marketing of the results of innovation activity in enterprises				
TR 30	R&D Tax Exemption	II.4. Increase rates of expenditure on research and technological innovation in enterprises	2005	No End Date Planned	New	No
TR 23	New Entrepreneur Support	IV.1. Increase the number of new innovation intensive enterprises created and their survival	2003	No End Date Planned	Modified	No
TR 22	Support for Hiring Qualified Personnel by SMEs	III.1. Facilitate access of enterprises to skilled personnel	2003	No End Date Planned	Modified	No

TR 19	ICT Support	II.5. Encourage the uptake of strategic technologies, notably ICT	2002	No End Date Planned	Modified	No
TR 18	Support for establishment of technology parks (the Law on Technology Development Zones)	III.3. Increase the availability, range and quality of specialised services to enterprises in order to increase the effectiveness of their in-house innovation activities	2001	2013	New	No
TR 16	Machinery/Equipment Support for Common Use by SMEs	III.4. Increase the availability of innovative infrastructures to facilitate knowledge exchange and product/service development by enterprises	2000	No End Date Planned	Modified	No
TR 15	Support for R&D Investment	II.4. Increase rates of expenditure on research and technological innovation in enterprises	2000	No End Date Planned	New	No
TR 10	Young Entrepreneur Development Programme	V.1. Upgrading innovation related skills and diffusing new technologies in enterprises	1998	No End Date Planned	New	No
TR 9	Industrial Property Rights Support	V.3. Favouring the protection and optimising the exploitation of intellectual property as a driver for innovation	1998	No End Date Planned	Modified	No
TR 8	Training Support	V.1. Upgrading innovation related skills and diffusing new technologies in enterprises	1998	No End Date Planned	Modified	No
TR 6	State Support for R&D (loan by TTGV)	II.4. Increase rates of expenditure on research and technological innovation in enterprises	1996	No End Date Planned	New	Yes
TR 5	State Support for R&D (grant by TUBITAK-TEYDEB)	II.4. Increase rates of expenditure on research and technological innovation in enterprises	1996	No End Date Planned	Modified	Yes
TR 4	Consultancy Support for SMEs	V.1. Upgrading innovation related skills and diffusing new technologies in enterprises	Before 1995	No End Date Planned	Modified	No
TR 3	Establishment of Technology Development Centres (TEKMERS)	IV.2. Provide adequate infrastructure to new technology based firms to facilitate their survival and growth	Before 1995	No End Date Planned	New	No
TR 2	Technology Research and Development Support	II.4. Increase rates of expenditure on research and technological innovation in enterprises	Before 1995	No End Date Planned	Modified	No

Table A5.2: Policy Measure Fiche: overview

IPM Fiche Number	Title of measure	Overview
TR 44	Support Programme for Patent Applications	<p>The aim of the measure is to raise the awareness towards industrial property rights in Turkey and increase the level of national and multinational patent applications filed by the Turkish researchers. Turkish researchers and companies established in Turkey where ownership of Turkish citizens is more than 50% can apply for support. The programme is run by Scientific and Technological Research Council of Turkey (TUBITAK) in cooperation with Turkish Patent Institute (TPE). Any citizen or company, who has filed a patent application to TPE after the date 23 August 2006, can file an application to TUBITAK for patent support. A company may receive grants for a maximum of 20 patent applications per year and an individual may be funded for a maximum of 5 patents. The upper limit for finance is around EUR1,700 for 2007.</p>
TR 43	Support Programme for Technology- and Innovation-focused Entrepreneurship	<p>This measure was developed by the Scientific and Technological Research Council of Turkey (TUBITAK) in order to encourage technology and innovation-based entrepreneurship. Funding as grants is available for entrepreneurs who have ideas with high potential to create high value added products and to create jobs. ;</p>
TR 42	Risk Sharing Facility Support	
TR 41	Start-up Support	<p>The aim of this support is to invest in talented entrepreneurs that have creative, unique and advanced-technology ideas and vision. The programme is being implemented by the Technology Development Foundation of Turkey (TTGV) and seeks for leading-edge technologies and rational business models. TTGV assess the risks of the target market sector and those inherent in early-stage companies, to find companies that have a clear path to success. Start-up support is provided to entrepreneurs for implementing their business plans. The upper limit of this support is around EUR340,000 USD. The finance is provided in the form of equity capital. In order to apply for this support, a business plan must be presented by the applying company or entrepreneur. ;</p>
TR 40	Support Programme for the First R&D Projects of SMEs	<p>This ;measure has been developed by the Scientific and Technological Research Council of Turkey (TUBITAK) in order to increase the number of R&D projects carried out by SMEs by offering a much faster and easier access for funding. The SMEs are expected to gain the capacity to develop new R&D projects and then apply to the more advanced R&D support programmes offered by TUBITAK. SMEs can apply to this programme for their first two R&D projects. The total budget of the project should be less than EUR220,000 and project duration should be less than 18 months. The upper limit of total project budget will be revised by the Science Board of TUBITAK every year. Up to 75% of the total eligible costs of project are financed as grants. The disbursement of the support takes place after the beneficiary company actually makes the payments and sends invoices to TUBITAK. ;</p>

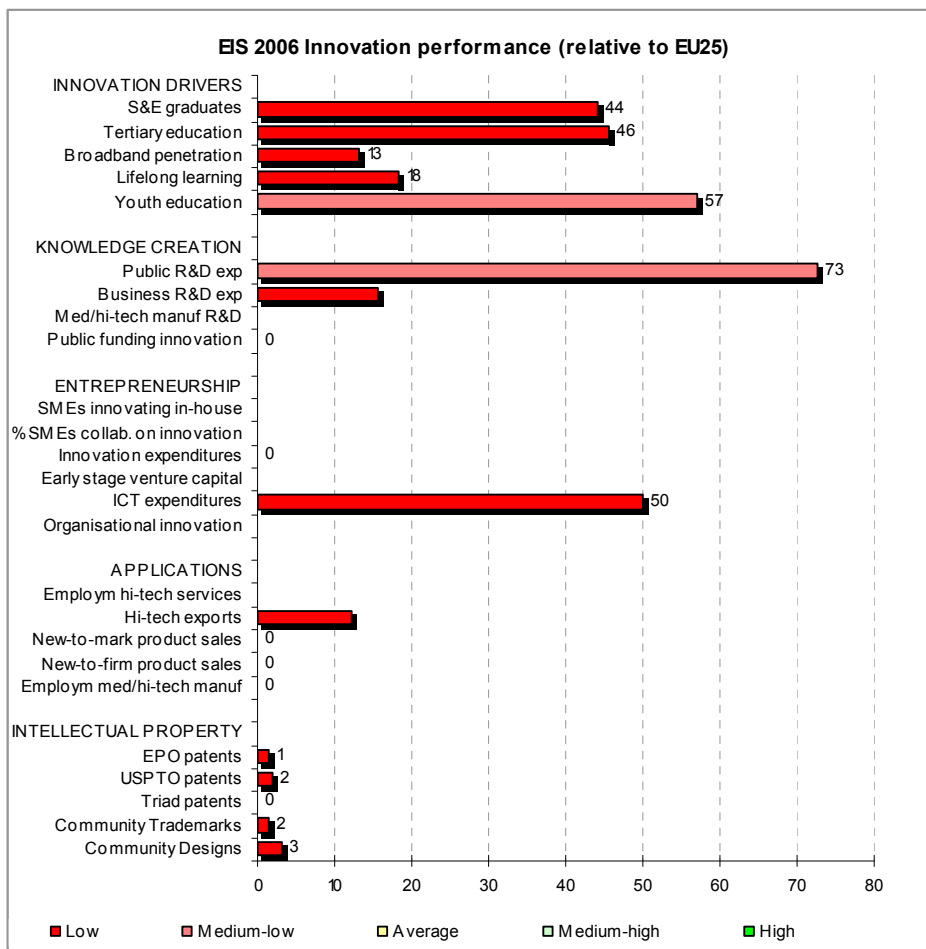
TR 39	Pre-Incubation Support Programme	The measure aims to support to entrepreneurs with an innovative idea and who are at the beginning of their business establishment or have not started any business yet. It is managed by the Technological Development Foundation of Turkey (TTGV). This type of support is provided to make an in-depth examination and to prepare high quality business plans that are candidates to restrained start up funds of TTGV. Besides financial investment the scope of this support includes research, consultancy and office set up services. Upper limit for support is around EUR42,000.
TR 38	Scientific and Technological Cooperation Networks and Platforms Support Programme (ISBAP)	The programme is implemented by the Scientific and Technological Research Council of Turkey (TUBITAK). The aim of the programme is to help establishment of sectoral or technological networks and platforms among national and international enterprises, public research institutes and scientific communities working on basic research, applied research, social sciences and related technology areas. Organisations interested in establishing a network should come together and prepare an action plan. The project proposal forms of TUBITAK should be filled in by a coordinating organisation (an already existing company or research centre). If such an organisation does not exist, a new organisation should be created by the network members; The upper limit for support is approximately EUR140,000 per year for the year 2007. Grant support is provided for 50% of all the eligible project costs
TR 37	Environmental Technologies Support Programme	The aim of the measure is to support development and dissemination of cleaner technologies which provide a better use of chemicals, raw materials and energy, and thus, decrease amount of industrial waste and pollution. Target companies are those industrial companies which are in need of using cleaner technologies in their processes and want to carry out some pilot activities for reducing the waste in their companies, or companies developing such technologies. The support is provided as a soft loan and the upper limit is around EUR830,000 (up to 50% of project budget).
TR 36	Energy Efficiency Support Programme	The aim of the Energy Efficiency Support programme is to decrease the greenhouse gas emissions by removing financial barriers for energy efficiency investments of industry and promotion of the usage of energy efficient technologies. Target companies are those industrial companies which use energy intensely in their processes and want to carry out some pilot activities for reducing the energy usage in their companies. The support is provided as a soft loan and the upper limit is around EUR830,000 (up to 50% of project budget).
TR 35	Renewable Energy Support Programme	The aim of the Renewable Energy programme is to increase the utilisation of Renewable Energy (RE) Resources by Industry by supporting development of RE technologies and dissemination of RE applications. Target companies are those industrial companies which either use energy intensely in their processes and want to carry out some pilot activities for production of energy using renewable sources or those developing RE technologies. The support is provided as a soft loan and the upper limit is EUR830,000 (up to 50% of project budget).
TR 34	Joint Technology Development Projects	The purpose of the measure is to support technology development projects comprised of main and applied research stages, in order to help to the vertical integration in supply chain and/or horizontal formation in pre-competition or in-competition cooperation in common activity areas. The projects must be proposed by a consortia formed from one or more company(ies), supplier(s), universities and research centres working in the same sector and must promote division of labour and cooperation in between partners starting from design and development phase to final innovative outputs targeted. Soft loan is available for such projects and upper limit for support is EUR2,000,000 (up to 60 percent of the project budget). The upper limit is 50 percent for projects involving only partners from industry.

TR 33	Commercialisation Project Supports	This measure aims to help commercialisation of results of R&D activities of companies. The companies supported under the Technology Development Projects Support Programme of the Technology Development Foundation of Turkey (TTGV) and successfully developed a prototype can apply to the Commercialisation Project Supports Programme . Upper limit of this support is EUR833,000 and finance is provided up to 50 percent of the project budget. The finance is provided in the form of loan.
TR 32	Industrial Thesis (San-Tez) Projects	This measure aims to stimulate co-operation between firms and universities by supporting M.S. and PhD thesis which were carried out by graduate level students in order to develop new technology-based products and processes and to transform the university research into innovative products and processes in line with the needs and requirements of the industry. Eligible projects are provided with grant finance up to 75 percent of the project budget. The rest is financed by the private sector while test and laboratory services are covered by the universities where the projects are being carried out.
TR 30	R&D Tax Exemption	This measure aims at stimulating investment in R&D by the industry through tax incentive. Based on a regulation issued in February 2005, tax exemption accounting to 40 percent of R&D expenditures of companies is to be applied by the Ministry of Finance. All companies conducting R&D activities in Turkey are eligible for support.
TR 23	New Entrepreneur Support	The measure aims to promote and disseminate the culture of entrepreneurship by financially supporting the establishment of successful enterprises. Grant support is provided for starting up the business (up to EUR2,500). Fixed investment costs are financed as grants if the equipment and machinery are leased; otherwise they are financed as loans. Upper limits for grant and loan are EUR6,250 and EUR25,000, respectively.
TR 22	Support for Hiring Qualified Personnel by SMEs	With this measure, grants are provided for SMEs to hire qualified personnel with a university or vocational higher school degree to improve SMEs access to new technologies and know-how. The level of finance varies between 60% and 80% of the wage of the qualified personnel graduated from a university (up to EUR11,250). Grants are provided for a period of 18 months.
TR 19	ICT Support	This measure targets diffusion of information technologies and e-business in SMEs. Grants are provided for (a) procurement of software related to simulation techniques, computer aided design, etc. (50% of software costs with an upper limit of EUR5,000 is financed); and (b) e-commerce activities (up to EUR1,875 for infrastructure and EUR2,500 for taking part in a portal).
TR 18	Support for establishment of technology parks (the Law on Technology Development Zones)	The Law on Technology Development Zones aims to foster establishment of technoparks in universities and/or research centres. It stimulates the mobility of human resources for innovation and research between the research community and business by providing incentives for researchers to work with private companies located in technoparks. The measure also encourages establishment of NTBFs and spin-offs as it is only possible for an academician to start up a company in technoparks established in accordance with the Law. In addition, incomes out of the R&D activities of companies in the technoparks designated by the Ministry of Industry and Trade are exempted from income and corporate taxes, and income of the R&D staff working in those companies is exempted from all taxes until the end of 2013.

TR 16	Machinery/Equipment Support for Common Use by SMEs	The measure targets establishment of Common Facility Workshops (ORTKAs) and the Common Purpose Laboratories (ORTLABs) for the use of SMEs. They are founded by the Small and Medium Industry Development Organisation (KOSGEB) together with SMEs and regional umbrella organisations. The main goal of the measure is to develop a culture of co-operation and to create a network between SMEs for the purposes of increasing productivity, production and product quality. Under this measure, soft loan is provided for the common equipment needs of SMEs working in the same sector. Maximum amount of support varies between 50% and 70% (depending on the level of development of the region) for grants used to procure machinery and equipment (up to EUR62,500), and 60% and 80% for loans (up to EUR250,000).
TR 15	Support for R&D Investment	This measure targets to increase investment in R&D by the industry by financing the procurement of R&D related equipment. Under this scheme, 50% of machinery, equipment and software expenses made for R&D purposes are financed as loans up to ?227,000. In addition, investment discount with a rate of 40% is applied under this scheme and machinery/equipment/software purchased for R&D is exempted from customs duty and value added tax.
TR 10	Young Entrepreneur Development Programme	This measure targets development and dissemination of entrepreneurship culture among university students. It is run together with the universities to train and educate undergraduate and graduate students for starting up their own businesses. During 1-year course, students are assisted with developing their business ideas and business plans.
TR 9	Industrial Property Rights Support	This measure aims to support protection of IPR by SMEs. Grants are provided for patent, useful model and industrial design applications of SMEs to the Turkish Patent Institute. By this support 70% of the application fee is financed with an upper limit of EUR3,750 for patent, useful model, industrial design and integrated circuit topography applications made in Turkey (EUR6,250 is provided for such applications abroad).
TR 8	Training Support	The measure aims to increase the competitive advantage of SMEs by upgrading their human resources with the aim of gaining necessary qualification, knowledge and skills to apply new and high technologies. The scheme is applied in two categories: (a) General Training Programmes are planned annually depending on the general demand by SMEs; (b) Training Support is provided at firm level based on the specific needs of SMEs on the topics like new and advanced technologies, modern production and management techniques, etc. which are not covered under item (a) above. Under this measure grants are provided to the SMEs on the topics like new and advanced technologies, modern production and management techniques, etc. Amount of finance is limited to EUR3,750 per year per company and upper limit of finance changes between 80 percent and 60 percent depending on the level of development of the region where the SME is located. The measure also helps establishment of a pool of qualified trainers. At the end of each training programme, performance of trainers is evaluated using a ranking system.
TR 6	State Support for R&D (loan by TTGV)	This measure aims to stimulate investment in R&D by the industry by providing soft loan up to 50% of the project budget with a maximum duration of 24 months. Maximum amount of funds is EUR 826,446 (1 EUR=1.21 USD). Repayment by the beneficiaries is done in 3.5 years including a grace period of 6 months. Experts from the research institutes and universities are collaborated in evaluation and supervision of the R&D projects of the industry. Visiting the companies by these experts in regular intervals and acting as mentors also increase the interaction between science and industry, and create a common ground for future co-operation. This scheme also allows providing soft loan to the industry up to 50% of the project budget if they participate in EUREKA.

TR 5	State Support for R&D (grant by TUBITAK-TEYDEB)	The measure aims to stimulate investment in R&D by the industry. To this end, grants are provided for R&D projects of the industry up to 60% of the project budget with a maximum duration of 36 months. Co-operation between the research and business communities is promoted under this measure. 30% increase in the amount of support is provided in case a company cooperates with a university and/or a research institute in its R&D project (with the condition that the upper limit of finance does not exceed 60%). For the same purpose, experts from the research institutes and universities are collaborated in evaluation and supervision of the R&D projects of the industry. Visiting the companies by these experts in regular intervals and acting as mentors also increase the interaction between science and industry, and create a common ground for future co-operation. This scheme also allows providing grants to the industry up to 50% of the project budget if they participate in an international programme such as EUREKA. Universities and/or public research centres are supported up to ?100,000 for their R&D project, if they co-operate with a local company in the international programmes. Conducting R&D in priority technology areas, hiring a research staff with PhD degree, projects proposed by SMEs, the share of original product sales in total sales and patenting cause an increase in the amount to be supported.
TR 4	Consultancy Support for SMEs	The measure foresees fostering innovative organisational and management practices in SMEs by supporting procurement of consultancy. Grant finance up to EUR9,400 is provided for SMEs. Percentage of the project budget to be financed changes from 60% to 80% depending on the level of development of the region where the SME is located. 100% support is provided for start-ups. The measure also helps establishment of a pool of qualified trainers. At the end of each training programme, performance of trainers is evaluated using a ranking system.
TR 3	Establishment of Technology Development Centres (TEKMERS)	With this measure, incubators (called as the ?Technology Development Centres? -TEKMERS) are established in co-operation with technical universities for supporting the start-up of technology-based companies. There are 12 TEKMERs established throughout the country. Small and Medium Industry Development Organisation (KOSGEB) provides finance and staff for establishment and operations of TEKMERs while universities co-finances the infrastructure. Lately, industrial chambers have also started to contribute financially in establishment of the centres. Companies located in TEKMERs are provided with all necessary infrastructures and secretarial services for running a business and are guided by a team of experts. Five categories of services are provided to the tenants under the support programmes implemented by KOSGEB: (a) Promotion and marketing services, (b) Information services, (c) Consultancy services, (d) Laboratory and workshop services, (e) Equipment and material support.
TR 2	Technology Research and Development Support	The measure aims to support research and development activities of SMEs. A mixture of grants and soft loan is provided for this purpose. Loan supports include (a) financing 80% of expenses (with an upper limit of EUR125,000) for procurement of equipment and materials required to develop a prototype; (b) financing improvement of the prototype that was developed through the Small and Medium Industry Development Organisation (KOSGEB) support (as a second phase finance) up to 80% with an upper limit of EUR31,250. SMEs can receive grants up to EUR31,250 and EUR9,300 respectively if they lease equipments for their projects supported under (a) and (b). In addition, grant finance is provided for the preparation of the project application file, publication of the results of R&D, procurement of consultancy, renting office in technoparks, work space allocation, provision of publications and for participation in congress, conferences and fairs abroad. Entrepreneurs who would like to start up their businesses by developing a prototype are also supported through this measure.

Annex 6: European Innovations Scoreboard: country pages



Turkey	1998	1999	2000	2001	2002	2003	2004	2005	Rel. to EU	Rel. year
Summary Innovation Index (SII)				0.10	0.09	0.09	0.08	0.08	19	2005
<i>relative to EU</i>				21	20	21	18	19		
<i>rank</i>				34	34	34	34	34		
INPUT - Innovation drivers										
1.1 S&E graduates	--	--	--	--	--	5.2	5.6	--	44	2004
<i>relative to EU</i>	--	--	--	--	--	42	44	--		
1.2 Population with tertiary education	--	--	8.3	8.4	9.1	9.7	--	--	46	2003
<i>relative to EU</i>	--	--	42	42	45	46	--	--		
1.3 Broadband penetration rate	--	--	--	--	--	--	0.5	1.4	13	2005
<i>relative to EU</i>	--	--	--	--	--	--	8	13		
1.4 Participation in life-long learning	--	--	1.1	1.0	0.9	1.2	1.3	2.0	18	2005
<i>relative to EU</i>	--	--	14	13	11	13	13	18		
1.5 Youth education attainment level	--	--	38.9	40.5	42.8	44.9	41.8	43.9	57	2005
<i>relative to EU</i>	--	--	51	53	56	59	55	57		
INPUT - Knowledge creation										
2.1 Public R&D expenditures	0.34	0.39	0.43	0.48	0.48	--	--	--	73	2002
<i>relative to EU</i>	53	61	67	74	73	--	--	--		
2.2 Business R&D expenditures	0.16	0.24	0.21	0.24	0.19	--	--	--	16	2002
<i>relative to EU</i>	14	20	17	20	16	--	--	--		
2.3 Share of med-high/high-tech R&D	--	--	--	--	--	--	--	--		
<i>relative to EU</i>	--	--	--	--	--	--	--	--		
2.4 Enterprises receiving public funding *	--	--	--	--	--	--	--	--		
<i>relative to EU</i>	--	--	--	--	--	--	--	--		
INPUT - Innovation & entrepreneurship										
3.1 SMEs innovating in-house *	--	--	--	--	--	--	--	--		
<i>relative to EU</i>	--	--	--	--	--	--	--	--		
3.2 Innovative SMEs co-operating with others *	--	--	--	--	--	--	--	--		
<i>relative to EU</i>	--	--	--	--	--	--	--	--		
3.3 Innovation expenditures *	--	--	--	--	--	--	--	--		
<i>relative to EU</i>	--	--	--	--	--	--	--	--		
3.4 Early-stage venture capital	--	--	--	--	--	--	--	--		
<i>relative to EU</i>	--	--	--	--	--	--	--	--		
3.5 ICT expenditures	--	--	13.1	5.6	4.1	3.2	--	--	50	2003
<i>relative to EU</i>	--	--	202	89	62	50	--	--		
3.6 Organisational innovation */**	--	--	--	--	--	--	--	--		
<i>relative to EU</i>	--	--	--	--	--	--	--	--		
OUTPUT - Applications										
4.1 Employment in high-tech services	--	--	--	--	--	--	--	--		
<i>relative to EU</i>	--	--	--	--	--	--	--	--		
4.2 Exports of high technology products	--	3.6	4.3	3.6	1.9	2.1	2.3	--	12	2004
<i>relative to EU</i>	--	17	20	17	10	11	12	--		
4.3 Sales new-to-market products *	--	--	--	--	--	--	--	--		
<i>relative to EU</i>	--	--	--	--	--	--	--	--		
4.4 Sales new-to-firm not new-to-market products *	--	--	--	--	--	--	--	--		
<i>relative to EU</i>	--	--	--	--	--	--	--	--		
4.5 Med-hi/high-tech manufacturing employment	--	--	--	--	--	--	--	--		
<i>relative to EU</i>	--	--	--	--	--	--	--	--		
OUTPUT - Intellectual property										
5.1 New EPO patents	--	--	--	--	--	1.9	--	--	1	2003
<i>relative to EU</i>	--	--	--	--	--	7	--	--		
5.2 New USPTO patents	0.5	0.3	0.6	0.7	0.9	1.0	--	--	2	2003
<i>relative to EU</i>	1	1	1	1	2	2	--	--		
5.3 New Triad patents	0.1	0.1	0.1	0.1	0.1	0.1	--	--	0	2003
<i>relative to EU</i>	0	0	0	0	0	0	--	--		
5.4 New community trademarks ***	--	--	--	0.5	1.2	1.4	1.0	1.5	2	2005
<i>relative to EU</i>	--	--	--	1	1	1	1	2		
5.5 New community designs ****	--	--	--	--	--	2.0	2.6	3.5	3	2005
<i>relative to EU</i>	--	--	--	--	--	3	3	3		

* For CIS indicators 2.4, 3.1, 3.2, 3.3, 3.6, 4.3 and 4.4: 2000 data refer to CIS3 survey, 2002 data refer to estimates based on CIS Light data, 2004 data refer to CIS4 survey. ** Data for 2000 and 2002 refer to SMEs using non-technological change. *** Data are for 2003 to 2006. **** Data are for 2004 to 2006.

Annex 7: Regional theme in the 2007 Country Reports: Support to clusters

Exhibit A7.1: National and regional cluster programmes

IPM fiche number: TR 38	Title of measure: Scientific and Technological Cooperation Networks and Platforms Support Programme (ISBAP)	Start date: 2007	End date: No end date planned
Programme initiator: TUBITAK	Source of programme/measure financing: State Budget		Not available
Implementation actor: TUBITAK	Was implementation actor created for this purpose: No Does actor have other tasks? Yes, see Annex 1 above.	Evaluated? No If no, any planned for the future? Yes	
Geographical coverage: National Are there any cross-country or inter-regional activities? No	Policy focus: Science and technology policy	Are clusters in a certain stage of the life-cycle targeted? The programme does not specifically target clusters but it is possible to apply for cluster development projects. Clusters in different stage of the life-cycle are expected to apply to the programme.	
Short description of programme content			
Activities: The networks/platforms/clusters are expected to carry out various activities to enhance their research and innovation capabilities (including technological road mapping and conducting collaborative research).		Ambition/goals: The aim of the programme is to assist the establishment of sectoral or technological networks/platforms by national and international enterprises, public research institutes and scientific communities working on basic research, applied research, social sciences and related technology areas.	
Target group: Companies, universities and research institutes	Level of R&D involvement? The core activity in an ISBAP project should be R&D.	What does the programme offer for the projects? The programme offers finance up to 50 percent of the project costs.	
Process: Selection is based on application.	Top down or bottom-up approach in selection of clusters to support? Bottom-up for clusters	Main element in applications? Organisations interested in establishing a network should come together and prepare an action plan. The project proposal forms of TUBITAK should be filled in by a coordinating organisation (an already existing company or research centre). If such an organisation does not exist, a new organisation should be created by the network members.	
Source: http://www.tubitak.gov.tr/home.do?sid=374&pid=364			

Annex 8: Sources of further information

A8.1 Websites of key innovation organisations

Type of organisation	Name	Website
National public agency	TUBITAK (Scientific and Technical Research Council of Turkey)	www.tubitak.gov.tr
National Government Ministry/department	DPT (State Planning Organisation)	http://www.dpt.gov.tr
National Government Ministry/department	MolT (Ministry of Industry and Trade)	http://www.sanayi.gov.tr
National Government Ministry/department	HM (Under-secretariat of Treasury)	http://www.hazine.gov.tr
National public agency	Small and Medium Industry Development Organisation (KOSGEB)	www.kosgeb.gov.tr
National public agency	TUBITAK-TEYDEB	http://www.tideb.tubitak.gov.tr
National public agency	TUBITAK-MAM (Marmara Research Centre)	http://www.mam.gov.tr
National public agency	UME (National Metrology Institute)	http://www.ume.tubitak.gov.tr
Not-for-profit foundation/organisations	Technology Development Foundation of Turkey	www.ttgq.org.tr
Other	focus:innovation	http://www.focusinnovation.net

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