

ARGENTINA

TECHNOLOGICAL MODERNIZATION PROGRAM III

(AR-L1012)

LOAN PROPOSAL

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Electronic Links and References	
Basic Socioeconomic Data	http://www.iadb.org/RES/index.cfm?fuseaction=externallinks.countrydata
Status of loan in execution and loans approved	http://ops/approvals/pdfs/ARen.pdf
Tentative lending program	http://opsgs1/ABSPRJ/tentativelending.ASP?S=AR&L=EN
Information available in the RE1/FI1 technical files	http://opsws3.reg.iadb.org/idbdocswebservices/getDocument.aspx?DOCNUM=668882
Procurement plan	http://opsws3.reg.iadb.org/idbdocswebservices/getDocument.aspx?DOCNUM=668701
TMP III summary table	http://opsws3.reg.iadb.org/idbdocswebservices/getDocument.aspx?DOCNUM=668693
Draft Operating Regulations	http://opsws3.reg.iadb.org/idbdocswebservices/getDocument.aspx?DOCNUM=668707
Socioenvironmental Annex to the Operating Regulations	http://opsws3.reg.iadb.org/idbdocswebservices/getDocument.aspx?DOCNUM=676263
Argentine National Innovation System	http://opsws3.reg.iadb.org/idbdocswebservices/getDocument.aspx?DOCNUM=668694
Draft PPMR	http://opsws3.reg.iadb.org/idbdocswebservices/getDocument.aspx?DOCNUM=677432

ABBREVIATIONS

Agency	Agencia Nacional de Promoción Científica y Tecnológica [National Agency for the Promotion of Science and Technology]
AHA	Ad-Hoc association
AWP	Annual work plan
CAE I	Créditos bancarios a empresas [Loans to enterprises]
CAE II	Créditos bancarios sindicados a empresas [Syndicated loans to enterprises]
CAE-FT	Créditos a empresas intermediados por un fondo tecnológico [Loans to enterprises placed through a technology fund]
DNPE	National Department of Planning and Evaluation
FAO	Food and Agriculture Organization of the United Nations
FONCYT	Fondo Nacional de Ciencia y Tecnología [National Science and Technology Fund]
FONTAR	Fondo Tecnológico Argentino [Argentine Technology Fund]
GDP	Gross domestic product
IFI	Intermediary financial institutions
INTA	Instituto Nacional de Tecnología Agropecuaria [National Institute for Agricultural and Livestock Technology]
IT	Information technology
MES	Monitoring and evaluation system
NRC	Nonreimbursable contributions
OR	Operating Regulations
PAE	Programas en áreas estratégicas [Programs in strategic areas]
PFDT	Programas de formación de doctores en áreas tecnológicas prioritarias [Doctoral training programs in priority technological areas]
PI	Project ideas
PICT	Proyectos de investigación científica y tecnológica [Scientific and technological research projects]
PICTO	Proyectos de Investigación Científica y Tecnológica Orientados [Targeted Scientific and Technological Research Projects]
PID	Proyectos de investigación y desarrollo [Research and development projects]
PIDRI	Programas de proyectos de investigación y desarrollo para la radicación de investigadores [Research and development projects for the relocation of researchers]
PI-TEC	Proyectos integrados de aglomerados productivos [Integrated productive cluster projects]
PME	Proyectos de modernización y equipamiento [Modernization and equipment projects]
PNCTIP	Plan Nacional de Ciencia, Tecnología e Innovación Productiva [National Plan for Science, Technology, and Productive Innovation]
R&D	Research and development
S&T	Science and technology

SECYT	Secretariat of Science, Technology, and Productive Innovation
SME	Small and medium-sized enterprises
SNI	National Innovation System
STO	Science and technology organization
TMP I	Technological Modernization Program I
TMP II	Technological Modernization Program II
UCGAL	Unidad de Control de la Gestión y Asuntos Legales [Management and Legal Affairs Control Unit]
UEAC	Unidad de Evaluación y Aseguramiento de la Calidad [Evaluation and Quality Assurance Unit]
UFFA	Unidad Funcional Financiera-Administrativa [Financial-Administrative Functional Unit]
UGSA	Unidad de Gestión Socio-Ambiental [Socioenvironmental Management Unit]

PROJECT SUMMARY

ARGENTINA TECHNOLOGICAL MODERNIZATION PROGRAM III (AR-L1012)

Financial Terms and Conditions ¹				
Borrower: Argentine Republic			Amortization period:	20 years
Executing agency: Secretariat of Science, Technology, and Productive Innovation (SECYT)			Grace period:	4.5 years
			Disbursement period:	4.5 years
Source	Amount	%	Interest rate:	LIBOR-based option
IDB (Ordinary Capital)	US\$280 million	55	Inspection and supervision fee:	0
Local	US\$230 million	45	Credit fee:	0.25%
Other/Cofinancing	-	-		
Total	US\$510 million	100	Currency:	U.S. dollars from the Single Currency Facility
Project at a Glance				
<p>Program objective: The program seeks to build Argentina's capacity in science and technology so as to address priority sector and social problems and contribute to sustainable gains in productive sector competitiveness and productivity through development of a new manufacturing model based on more technology intensive goods and services. The program purpose is to contribute to strengthening the National Innovation System and the Regional Innovation Systems by increasing the innovative and associative capacities of their participants, contributing to the development of a modern scientific and technological infrastructure that supports national efforts aimed at generating knowledge and integrating science and technology into various activities and sectors in Argentine society.</p> <p>Special contractual conditions: As conditions precedent to disbursement of the loan proceeds: (a) the Evaluation and Quality Assurance Unit (UEAC), Information Systems Unit, and Socioenvironmental Management Unit (UGSA) must have been established at the National Agency for the Promotion of Science and Technology ("the Agency") (see paragraph 3.11); and (b) the program Operating Regulations must have entered into force (see paragraph 3.19). Continued loan disbursements will be contingent upon the following conditions being met within the respective deadlines: (i) coordinators have been hired for the UEAC, UGSA, and USI within three months after the loan contract signature date; (ii) all professional staff have been hired for these units within six months after signature of the loan contract (see paragraph 3.11).</p> <p>Special execution conditions (see paragraph 3.18): (i) the execution and entry into force of the first contract with the IFIs will be a condition precedent to the disbursement of resources for the CAE I and CAE II lines of the Technological Modernization Subcomponent (loan) of Subprogram I; and (ii) the execution and entry into force of the Trust Contract will be a condition precedent to the disbursement of resources for the CAE-FT line.</p> <p>Exceptions to Bank policies: None.</p>				
<p>Project consistent with country strategy: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>Project qualifies as: SEQ <input type="checkbox"/> PTI <input type="checkbox"/> Sector <input type="checkbox"/> Geographic <input type="checkbox"/> Headcount <input type="checkbox"/></p> <p>Procurement: See paragraphs 3.21 to 3.25.</p> <p>Verified by CESI on: 10 February 2006</p>				

¹ The interest rate, credit fee, and inspection and supervision fee mentioned in this document are established pursuant to document FN-568-3 Rev. and may be changed by the Board of Executive Directors, taking into account the available background information, as well as the respective Finance Department recommendations. In no case will the credit fee exceed 0.75%, or the inspection and supervision fee exceed 1%, of the loan amount.*

* With regard to the inspection and supervision fee, in no case will the charge exceed, in a given six-month period, the amount that would result from applying 1% to the loan amount divided by the number of six-month periods included in the original disbursement period.

I. FRAME OF REFERENCE

A. Socioeconomic framework

- 1.1 From 1998 to 2002, Argentina experienced a financial, economic, and social crisis unlike any in its contemporary history. By the end of 2002, over four years it had amassed a cumulative 20% drop in gross domestic product (GDP), leaving over half its population below the poverty line. After overcoming the worst of the crisis, the country has sought to rebuild confidence in its institutions and put its economy on a path toward sustainable recovery. Efforts aimed at stabilization and adaptation to new socioeconomic circumstances have led to an economic recovery based on the use of slack capacity, increased exports, and the recovery of domestic consumption, with annual GDP growth rates reaching 8.8% in 2003 and 9% in 2004 and 2005. Today, the GDP has returned to precrisis levels, and this has had an impact on employment levels and poverty reduction.
- 1.2 Argentina faces a number of challenges to continued recovery (see [the Bank's country strategy with Argentina, document GN-2328-1](#)). One is strengthening the country's competitiveness, which, according to the growth competitiveness indexes published by the World Economic Forum (WEF), ranks 72nd among the 117 countries analyzed in 2005.¹ As part of its strategy to meet this challenge, the Ministry of the Economy's Secretariat of Industry has convened "Sector Competitiveness Forums" for the country's primary supply chains in an attempt to develop policies to stimulate their competitive advantages and increase the value of their sales, their positioning in the global economy, employment, and local productive linkages.

B. Argentina's National Innovation System

- 1.3 Argentina's National Innovation System (SNI) comprises a group of scientific and technological institutions, most of which were established in the mid-twentieth century. The major institutions are: Consejo Nacional de Investigaciones Científicas y Tecnológicas [National Council on Scientific and Technological Research] (CONICET); Instituto Nacional de Tecnología Agropecuaria [National Institute for Agricultural and Livestock Technology] (INTA); Instituto Nacional de Tecnología Industrial [National Institute for Industrial Technology] (INTI); Comisión Nacional de Energía Atómica [National Atomic Energy Commission] (CNEA); Comisión Nacional de Actividades Espaciales [National Space Commission] (CONAE); Instituto Nacional del Agua [National Water Institute] (INA); Instituto Nacional de Investigación y Desarrollo Pesquero [National Institute for Fisheries Research and Development] (INIDEP); and the Administración

¹ This index has three components: quality of the macroeconomic environment, the state of public institutions, and technological preparedness.

Nacional de Laboratorios e Institutos de Salud [National Healthcare Institution and Laboratories Administration] (ANLIS).²

- 1.4 The Secretariat of Science, Technology, and Productive Innovation (SECYT) was created in 1970 as the agency under the Office of the President of the Republic responsible for policy-making and coordination of activities among the various scientific and technological institutions. Reforms began in the 1990s and were later consolidated into the Public Science and Technology Act, approved in 2001. This law reaffirmed the role of SECYT's National Agency for the Promotion of Science and Technology ("the Agency") as the agency responsible for the organization and administration of instruments for the promotion of innovation and scientific and technological development. Since its creation in 1996, the Agency has been the primary financer of research and innovation projects in Argentina through two specific grant funds: Fondo Nacional de Ciencia y Tecnología [National Science and Technology Fund] (FONCYT) and Fondo Tecnológico Argentino [Argentine Technology fund] (FONTAR). FONCYT finances scientific research projects, while FONTAR promotes technological development in the country's productive sector. The Agency executed the Bank-funded Technological Modernization Programs I and II (see paragraph 1.13 and paragraph 1.14), and operates a tax incentive program to promote business investment in technology activities.

C. The productive impact of science and technology (S&T) capacity

- 1.5 Although the economy's development has been supported by the exploitation and industrialization of natural resources, experience over the last two years shows that opportunities exist to incorporate greater knowledge into these sectors, while contributing to increasing their competitiveness and value-added.
- 1.6 In this regard, the impact of some of Argentina's S&T institutions has been quite relevant. Technological developments and outreach work undertaken by INTA have contributed to the increased crop harvests and the appearance of new crops between 1960 and 2004. Argentina's leadership in direct sowing techniques allowed a sharp increase in the production of soy and other crops, while preserving natural resources and developing the agricultural machinery sector, one of the country's most dynamic sectors.
- 1.7 Argentina has also developed the ability to build satellites for scientific purposes and topographical surveys of the country. It was also the first country in Latin America to implement a nuclear reactor for power production, built with the participation of domestic firms. These developments have allowed it to export reactors for experimentation and production of radioisotopes to Peru, Algeria, and Australia, among other countries, since the 1980s. Participation in the construction of reactors had a major impact on the development of the technological capacity of

² For further details, see the document on Argentina's [National Innovation System](#).

metal working companies, which now have competitive skills at an international level. One outstanding example is the design and construction capacity for turbines and electric motors, which has achieved a high degree of acceptance in global markets.

- 1.8 As the country recovers from the crisis, its human resource base has allowed it to develop new knowledge-based sectors. The software and IT services sector had sales of US\$1.3 billion in 2005, with exports of over US\$250 million, up 30% with respect to 2004. The scientific foundation in biology and biomedicine has supported the development of approximately one hundred biotechnology enterprises, which are active on both domestic and international markets.
- 1.9 Nevertheless, Argentina still shows a relatively low investment in science, technology, and innovation. Since the mid-1990s, investment in research and development (R&D) has remained between 0.40% and 0.45% of GDP, with approximately one quarter of the total coming from the private sector. This figure does not compare well to the situation in developed nations, whose R&D investment, made primarily by the private sector, is generally between 2% and 3% of GDP. Argentina's R&D investment also lags behind the 2003 percentages of Brazil (0.97%) and Chile (0.61%).

D. The country's sector strategy

- 1.10 SECYT recently published the "Framework for a Medium-term Strategic Plan in Science, Technology, and Innovation 2005-2015," which sets four strategic objectives: (i) targeting of R&D toward a greater understanding of the country's problems, better quality of life, and social development; (ii) creating and applying knowledge for the responsible exploitation of natural resources and environmental protection; (iii) strengthening of innovation, modernization, and technological linkages in productive activities; and (iv) increasing the country's scientific base and technological capacity. These objectives are reflected in the following ten-year targets: (a) the number of researchers will increase from 1.6 to 3 full-time equivalent researchers per thousand members of the economically active population; (b) the total investment in R&D will reach the equivalent of 1% of GDP; (c) private investment in R&D will increase until it is on par with public investment; and (d) the 19 provinces with the lowest investments in R&D, which currently garner just 20% of the nation's R&D resources, will double their share of the national total.
- 1.11 Considering the problems of coordination among institutions, the limited connection to the needs of enterprises and society, the low capacity for adaptation to international changes, and the excessive geographic and institutional concentration of R&D activities, the Foundations document proposes actions to address the system of relations between institutions and society, within the framework of a process promoting interdisciplinary work, cooperative networks,

and the development of scientific and technological solutions as a response to economic and social problems.

E. The Bank's sector strategy

- 1.12 The Bank began working in Argentina's S&T sector in 1966 with a US\$1 million loan (91/SF-AR) to equip the CNEA metallurgy laboratories. Subsequently, the Bank approved loans for US\$66 million (348/OC-AR; 1979), US\$61 million (515/OC-AR; 1986), US\$95 million (802/OC-AR; 1993), and US\$140 million (1201/OC-AR; 1999).
- 1.13 With loan 515/OC-AR in 1986, a competitive form of financing was initiated for R&D projects, with peer evaluation, and also including financing to establish a series of national research and service laboratories, fellowships for researcher training, and a pilot program to promote joint R&D projects between universities and enterprises. In addition to continuing the financing of projects through competitive peer evaluation processes, Technological Modernization Program I, financed with loan 802/OC-AR approved in 1993, supported the creation of FONTAR to finance enterprise R&D projects. This operation was restructured in 1996, and its resources were implemented through two funds (FONCYT and FONTAR), which gave structure to the Agency, created that year.
- 1.14 Technological Modernization Program II (TMP II - loan 1201/OC-AR), approved in 1999, currently in the final phase of execution, consolidated the Agency's SNI support mechanisms through grant financing for projects through FONCYT and FONTAR, which allowed a significant part of SNI's institutions to frame their actions within the principles of competence, quality, transparency, efficiency, cofinancing, and evaluation that are part of the Agency's project selection criteria. This also leveraged significant resources from these institutions, which, in turn, facilitated a considerable increase in the number, amount, and types of R&D projects executed with respect to the previous program. In this regard, during the execution of TMP II, cofinancing was provided for over 600 enterprise innovation projects (US\$30 million), 2,350 R&D projects at universities and academic institutions (US\$120 million), over 70 research projects with adopters (US\$9 million), and 100 projects equipping research centers (US\$18 million), among others. It is important to note that after overcoming the economic crisis in Argentina, which affected the counterpart commitments for all programs in the country, TMP II stepped up its pace of execution during 2004 and 2005. Experience over the last two years indicates that there is a demand for projects that have not been covered by TMP II, evidenced by a considerable portfolio of projects with satisfactory evaluations that were not approved for lack of funds. It is estimated that the magnitude of this demand is approximately 400 projects per year with high

innovative merit in enterprises, 500 high quality R&D projects, and a total of US\$50 million in R&D laboratory equipment projects.³

F. Coordination with other donors

- 1.15 Although the IDB has been the multilateral institution that has accompanied S&T development in Argentina most closely in recent decades, the World Bank also financed a higher education program between 1996 and 2003. The program included two components: (a) strengthening of the Office of the Secretary of University Policies and creation of the National University Evaluation and Accreditation Commission; and (b) creation of the Fund for Quality Improvement, which financed projects to enhance the quality of education.

G. The Bank's country strategy and additionality

- 1.16 The Bank's country strategy for 2004-2008 has the main goal of supporting Argentina in achieving sustainable and more equitable growth. To pursue that goal, it proposes the following principal areas of strategic focus: (i) institutional strengthening for better governance and fiscal sustainability; (ii) a more favorable climate for investment and productivity growth, to enhance the country's competitiveness; and (iii) poverty reduction, rebuilding the human resource base and promotion of sustainable and inclusive social development.
- 1.17 In the area of creating a more favorable climate for investment and productivity growth, the strategy indicates that the development of a third phase of the Technological Modernization Program will be sought, promoting a greater integration of technology and innovation into the productive sector, and adding greater depth to actions aimed at bringing technology institute and university offerings in line with the demands of business, especially SMEs. The Bank's continued participation in supporting scientific development and technological modernization programs is in keeping with its country strategy with Argentina for 2004-2008, as well as with Argentina's own development strategies.

H. Evaluation of TMP II and rationale for the new program

- 1.18 To analyze the effects of TMP II, the Bank's Office of Evaluation and Oversight (OVE) is evaluating the impact of FONTAR and FONCYT's primary lines of support. The evaluation strategy is based on the collection of primary data through interviews with beneficiaries and their respective control groups, as well as bibliometric studies and studies on panels of beneficiaries. The Bank has also commissioned an evaluation of the incremental benefits generated by a sample of projects financed through NRCs, executed from 2000 onward. The main findings of

³ For further details, see [Execution summary for TMP II](#), [Itemized budget for TMP III](#), and [Basis for dimensioning of the new program](#).

the evaluations are: (a) *Bibliometric impact of PICTs*.⁴ the effect of having received the grant from FONCYT was positive and statistically significant for all specifications and estimation methods used. This positive impact on researchers' academic performance is independent of the fact that the highest quality projects or researchers could have been selected; (b) *Effect on private investment in R&D*.⁵ through its lines of private sector support, FONTAR generated an incremental positive and statically significant effect on private spending on R&D by the panel of enterprises analyzed between 1994 and 2002; and (c) *Incremental benefits of NRCs*.⁶ the estimated socioeconomic benefits of just ten enterprise innovation projects executed between 2001 and 2005 are sufficient to offset the present value of the total cost of execution of the NRC line in the same period. Furthermore, all projects analyzed through case studies generated positive private value-added and significant social benefits through positive externalities. The conclusion of these evaluations is similar to the conclusion obtained in other countries using similar methodologies: given the externalities associated with R&D, the amounts invested tend to be below socially optimum levels, which rationalizes the use of public resources, for both projects to support academic research and to promote enterprise innovation. The evaluations also lead to the conclusion that, in general, the project selection and financing mechanisms used by the Agency have had socially beneficial outcomes.

- 1.19 Notwithstanding these positive effects, and based on the recommendations made in the evaluations, the new program incorporates certain innovations and modifications to the different FONTAR and FONCYT lines to reduce the possibility of “crowding out” in private investment, to prioritize research projects that leverage other sources of funding, to grant greater importance to the generation of “spillovers” and externalities, as well as financial and socioenvironmental sustainability as selection criteria, and to promote coordination of the instruments as

⁴ [Chudnovsky, D. et al, “Evaluating a program of public funding of scientific activity. The case of FONCYT in Argentina.”](#) Centro de Investigaciones para la Transformación [Transformation Research Center] (CENIT), 2005. This study compares the performance, measured in terms of publications in refereed journals, controlling for quality, of a sample of scientists financed with PICTs (n = 218) with respect to a control group made up of researchers who applied to receive a grant for projects of acceptable quality, but did not receive financing (n = 105). Three methods of estimation were used: controlled regressions, difference in differences, and matching.

⁵ [Maffioli, A., “Análisis Microeconómico del Impacto del Programa FONTAR sobre la Inversión Privada en R&D”](#) [Microeconomic Analysis of the Impact of the FONTAR program on Private Investment in R&D]. Presentation by the IDB Office of Evaluation and Oversight, 2005. This study analyzes the effect on the level of investment in R&D of enterprise beneficiaries of FONTAR instruments for a complete panel (750 enterprises and 30 beneficiaries) between 1994 and 2002.

⁶ [CENIT, “Programa de ANR del FONTAR: Una Evaluación de Beneficios Sociales a través de Estudios de Caso”](#) [FONTAR NRC Program: An Evaluation of Social Benefits through Case Studies], 2006. A cost-benefit analysis was performed using case studies, with a methodology analogous to the one used in evaluations of similar instruments in Chile (FONTEC) and the United States (Advanced Technology Program).

a function of objectives and problems of national interest. Thus, TMP III is broadly justified by the incorporation of these innovations, the effect of leveraging the SNI resources and system, the solid evaluation findings, the proven mechanisms and institutional capacity for the execution of TMP II, and the federal government's growing commitment to address the challenges identified in its Framework for a Medium-term Strategic Plan in Science, Technology, and Innovation 2005-2015 (see paragraphs 1.10, 1.11, and 1.14).

I. Program strategy and lessons learned

- 1.20 The program strategy considers the primary challenges and objectives identified in SECYT's Framework for a Medium-term Strategic Plan in Science, Technology, and Innovation 2005-2015. In particular, the program's specific objectives are to build research capacity while increasing annual financing for projects; promote training of doctorate-level researchers in priority areas; promote innovation in enterprises through nonreimbursable contributions and loans; contribute to the creation of R&D units in enterprises; support integrated programs in strategic areas that promote the formation of networks involving research laboratories and enterprises; and promote innovation in productive clusters through integrated projects in which the different FONTAR and FONCYT instruments converge.
- 1.21 The program design incorporates the lessons learned from execution of the Technological Modernization Programs previously financed by the Bank. The TMP I and TMP II programs supported the development of a new institutional framework for the financing of science, technology, and innovation activities through the Agency and its two funds, FONCYT and FONTAR. The operating methods of these funds were based on the "horizontal public policy" approach, ensuring eligibility criteria based on competition among enterprises and researchers for public resources without the prior selection of economic sector beneficiaries. Horizontal public policies also ensured that transparency criteria would be met in the allocation of resources. The Agency adhered to such criteria in considering the projects submitted by the enterprises and research institutions. However, more recent international experience indicates that market failures warranting state intervention in the area of research, development, and innovation are not resolved with horizontal policies alone, but also require policies with a broader outlook, such as the development of productive clusters and districts, as well as strategic research programs aimed at resolving priority sector and social problems. Thus, the horizontal approach must be rounded out with more proactive action by the Agency, while following the rigorous technical and evaluation criteria it has already adopted.
- 1.22 The Bank's experience with loan programs also shows that: (i) a longer payback period is not a sufficient catalyst for bank lending to the entrepreneurial sector; (ii) given the high risk due to the technological nature of the investments, loans often fail to materialize, so mechanisms are needed to reduce this risk; and (iii) risk

must be assumed and credit decisions made solely and exclusively by financial intermediaries. The new program will also implement mechanisms that make second-tier lending with these characteristics possible, in order to promote technological modernization and innovation within enterprises.

- 1.23 As indicated in the Bank's current S&T strategy⁷ and in the evaluation by the Office of Evaluation and Oversight,⁸ in order to achieve greater relevance in research projects financed with public resources, proactive policies to promote cooperation among research institutions, the private sector, and society must be implemented much more systematically and vigorously. TMP III will maintain the horizontal policies that guided the previous programs, in keeping with the Medium-term Strategic Plan in Science, Technology, and Innovation, and will incorporate instruments promoting closer partnerships between centers for innovation and enterprises within the framework of integrated projects, programs in strategic areas, and the targeting of scientific and technological research toward the resolution of specific problems.
- 1.24 A [socioenvironmental management assessment of TMP II](#) was done during project preparation, along with an environmental impact assessment of a sample of 21 program-financed projects. In the sampled projects, no adverse impacts resulting from their execution were confirmed. In any event, to reduce the risk of potential adverse impacts in the future, TMP III has a socioenvironmental management strategy that corrects the problems detected during assessment (see paragraphs 4.9 to 4.12). It establishes operating mechanisms to strengthen the environmental management of projects, analyze their potential impacts, and effectively monitor socioenvironmental considerations throughout execution of the new program.

⁷ IDB, Science and Technology for Development: A Strategy Paper (GN-1913-2).

⁸ IDB, Science and Technology Program Evaluation: Synthesis Report (RE-227), July 1999.

II. THE PROGRAM

A. Program objectives and description

- 2.1 The program seeks to build Argentina's capacity in science and technology so as to address priority sector and social problems and contribute to sustainable gains in productive sector competitiveness and productivity through development of a new manufacturing model based on more technology intensive goods and services. The program purpose is to contribute to strengthening the National Innovation System and the Regional Innovation Systems by increasing the innovative and associative capacities of their participants, contributing to the development of a modern scientific and technological infrastructure that supports national efforts aimed at generating knowledge and integrating S&T into various activities and sectors in Argentine society. The program's activities are structured into three subprograms, whose execution, for each of their lines of financing, will be tailored to the provisions of the [program Operating Regulations](#). [Annex II](#) summarizes the general features of all lines of financing.

1. Subprogram I: Innovation in the productive sector (US\$195 million)

- 2.2 The purpose of this subprogram, to be executed by FONTAR, is to consolidate and expand the productive sector's technological innovation capacity. The subprogram will provide reimbursable and nonreimbursable financing to technological modernization and innovation projects by individual enterprises, as well as to groups of firms and S&T institutions belonging to productive clusters, for the resolution of common problems and the promotion of local competitiveness. The subprogram has two components: (i) building technological innovation capacity in the productive sector; and (ii) consolidation of alliance-building in the productive sector.
- 2.3 The **technological innovation in the productive sector component (US\$155 million)** will have the following subcomponents: (i) technological modernization projects, financed by loans and nonreimbursable contributions;⁹ (ii) support for the technological development of small and medium-sized enterprises (SMEs) through nonreimbursable contributions (NRCs); and (iii) capacity-building for the delivery of technological services to the private sector through reimbursable contributions to nonprofit public and private institutions.

⁹ As an exception, up to US\$12 million in technological modernization projects from the 2004 notice, which were reviewed and approved by the Bank's Country Office in Argentina, will be financed with resources from the new loan through the CAEFIPP line of credit operated directly by FONTAR under the previous program (TMP II).

- 2.4 *Technological modernization subcomponent.* This subcomponent's objective is to provide financing mechanisms for enterprise technological modernization projects. These mechanisms, running on an open window cycle, will be organized around three instruments:
- a. **Loans to enterprises (CAE I).** This instrument will consist in the financing of eligible first-tier financial institutions so that they, in turn, can grant loans to enterprises presenting technological modernization projects with high capital goods content. The intermediary financial institutions (IFIs) will assume 100% of the credit risk.
 - b. **Syndicated loans to enterprises (CAE II).** CAE II is an IFI financing instrument analogous to CAE I, with the difference that up to 50% of the loan made by the IFIs and funded by FONTAR may be syndicated *pari passu* with FONTAR. This line will be aimed at projects with a higher proportion of intangibles/capital goods than CAE I.
 - c. **Loans to enterprises placed through a technology fund (CAE-FT).** This fund will finance technology-based startup projects, enterprises with limited credit histories, and/or highly innovative projects with a high proportion of intangibles. The technology fund would be funded by FONTAR and, *pari passu* at 50%, by third party funds. The technology fund will be open to the incorporation of additional private partners.
- 2.5 FONTAR may, as a complement to the loan operations, grant nonreimbursable contributions (NRCs) to cover up to 50% of the total value of the high technological risk intangible components of the project. The maximum proportion of NRCs may not exceed 30% of the loan.
- 2.6 Eligibility for loans by borrower enterprises and the IFIs is detailed in the program [Operating Regulations](#) (OR), where it is established that loan decisions will be made by third-party legal entities that assume at least 50% of the operation's risk.
- 2.7 The following activities may be financed: (a) modification or improvement of product or process technologies with respect to those used by the company; (b) introduction of production management technologies that boost competitiveness; (c) technological developments necessary to move past the pilot into the manufacturing phase; (d) technology acquisition and engineering work associated with it; (e) technology licensing and transfer to the enterprise; (f) incorporation of information and communications technologies into the productive process; (g) implementation of quality systems; (h) process and/or product development; and (i) construction of prototypes or pilot plants, in which intangible expenses in R&D, technological developments, and engineering efforts have a significant impact on their structure.

- 2.8 The loans will have the following characteristics: (a) they will be denominated in Argentine pesos with a maximum term of nine years, including a grace period of up to four years; (b) the amount of the loan will not exceed 80% of the total cost of the project or the equivalent in pesos of US\$1 million. The enterprise will contribute at least 20% of the total project cost. If complementary NRC financing is incorporated, the 80% will be calculated on the net amount, after deduction of the intangibles, and the enterprise must contribute at least 50% of the cost of the intangible components. The maximum amount to be financed through NRCs will be the peso equivalent of US\$200,000; and (c) the interest rate on the subloans will be set by the IFIs (CAE I and CAE II) and by the CAE-FT management committee.
- 2.9 SME technological development subcomponent. This subcomponent includes lines of nonreimbursable contributions (NRC) for up to 50% of the cost of SME technological development projects. Projects eligible for financing, to be selected through periodic public announcements, include: (a) NRCs of up to US\$200,000 for technological innovation projects; (b) NRCs of up to US\$200,000 for the creation of R&D units within SMEs, for which 50% of the incremental R&D personnel compensation and equipment costs not to exceed 30% of the project total will be financed; and (c) NRCs of up to US\$75,000 for technical assistance and training projects in a group of SMEs with similar technology issues, through technology consultants, to stimulate their technological development.
- 2.10 This subcomponent also includes a line, operated on an open window cycle, to finance the preparation and filing of applications for patents and other intellectual property rights by SMEs and nonprofit public and private scientific institutions. Program resources will cover up to 80% of the eligible costs, not to exceed US\$5,000 for preparation and filing of applications in Argentina, and up to US\$75,000 for filing in other countries.
- 2.11 Building productive sector technological service capacity subcomponent. This subcomponent seeks to strengthen the development and delivery of technological services for the productive sector through the creation, expansion, or enhancement of facilities, equipment, and training of human resources, by means of reimbursable contributions to institutions of up to 80% of the total project cost and a maximum amount of US\$2 million. Projects may be submitted on an open window cycle by state and private universities, producer and business associations, municipal and provincial government agencies, and any other nonprofit legal entity that provides technological services to the productive sector. Potential beneficiaries will present project ideas, which if accepted, will undergo a second round of evaluation once the detailed projects are developed.
- 2.12 The **productive sector alliance-building component (US\$40 million)** will finance, through competitive public processes, integrated productive cluster projects (PI-TEC) to encourage the development of clusters, by promoting alliance-building and collaborative work among enterprises and universities, provincial or

local governments, and/or research centers, through projects that involve the convergence of the FONTAR and FONCYT lines. Thus, this new operating mode will support comprehensive programs of research, development and innovation activities with the participation of groups of companies, research centers and educational institutions linked in a single region or productive cluster. Given its integrating nature, PI-TEC seeks to improve coordination and synergies among the instruments supporting innovation available to the Agency, so they can have a greater impact while favoring the convergence of interests and the establishment of a collective innovative dynamic.

- 2.13 The Agency will issue public calls for the submission of PI-TEC Project Ideas (PIs), to be presented by an ad-hoc association (AHA), including representatives of at least three key participants in the development of the productive cluster, such as representative business entities, technological entities, universities, provincial or municipal governments, or other organizations relevant to the productive cluster. The executing agencies of the various activities involved in the project will participate in the AHA.
- 2.14 The PIs must provide information on the productive cluster's competitive challenges, how the proposed activities contribute to addressing them, and the participants involved, their contributions, and commitments for project execution. The PIs will be evaluated by an ad-hoc commission made up of experts in local innovation systems, productive cluster competitiveness, and participants in the entrepreneurial or business sector, according to the criteria and procedures established in the OR. Based on the ad-hoc commission's recommendations, the director of the Agency will select the PIs it will support for presentation as PI-TEC projects. The selection of the PIs will include definitions of requirements and commitments to be included by the applicant in the development of the project. For development of the project, including the drafting of a Competitive Enhancement Plan, the selected AHAs may receive support of up to US\$40,000. The developed presented project will be subject to a process of dialog and potential reformulation between FONTAR and the AHA. The projects approved in PI-TEC will be evaluated and executed in accordance with the specific conditions of each of the Agency's instruments or lines of financing.

2. Subprogram II: Consolidation of research and development capacity (US\$260 million)

- 2.15 The purpose of this subprogram is to build and expand the capacity for the generation of scientific and technical knowledge, through two components: (i) building capacity in science and technology; and (ii) building capacity in human resources. The subprogram is aimed at nonprofit public and private institutions, including universities, research institutes, and public and private technological development centers. In all cases, nonreimbursable financing will be granted

through public announcements and awarded through both domestic and foreign peer evaluation processes.

- 2.16 The **building capacity in S&T component (US\$172 million)** includes the following subcomponents: (i) scientific and technological research projects, whose purpose is to develop new knowledge in all areas of S&T (PICTs), as well as to support research groups aspiring to become entrepreneurs (PICT-Startup); (ii) targeted scientific and technological research projects (PICTOs), to be cofinanced between FONCYT and national or provincial entities, universities, NGOs, and/or enterprises, aimed at promoting calls for research in areas of interest defined by both parties; (iii) research and development projects (PIDs), aimed at the generation and application of new knowledge to obtain precompetitive or high socioeconomic impact results, to be cofinanced *pari passu* by one or more adopters; (iv) modernization and equipment projects (PMEs), aimed at the purchase, installation, development, adaptation, or construction of equipment for laboratories and R&D centers in nonprofit public and private institutions, including state and private universities, to be used for basic or applied research; and (v) programs in strategic areas (PAEs), targeting research networks or associations, in order to support integrated projects aimed at priority scientific sectors or for the solution of problem areas from the productive or social point of view, within the framework of the National Plan for Science, Technology, and Productive Innovation (PNCTIP).
- 2.17 Programs in strategic areas (PAEs) are aimed at developing a “cluster of knowledge” on priority areas and issues, and will be structured in a group of subprojects according to the various FONCYT and FONTAR lines, based on a primary objective. The PAEs will be proposed by an AHA, composed of at least three nonprofit public or private scientific research and/or technological development institutions. For projects having an impact on the production of goods and services, the AHA will include one or more business entities from the respective sector.
- 2.18 The Agency will issue periodic calls for the presentation of PIs in the various PNCTIP strategic areas, through competitive bidding processes. The accepted PIs will be sent to the evaluation commissions who will consider the scientific and technological quality of the PI, including its viability, its respect for safeguard policies, the strengths of the associative model, its relevance, and impact. To form these commissions, FONCYT will call upon peers in the field, sector specialists, and representatives of business and civil society. The commissions will draft a report to include recommendations to be sent to an ad-hoc commission to be coordinated by the chair of the Agency’s Board of Directors. The ad-hoc commission will propose the order of merit of the PIs evaluated favorably by the evaluation commissions, with recommendations for the development and validation of the projects. Final PI approval will involve the simultaneous authorization to allocate a grant to the AHA, of up to US\$10,000, for development of the final project.

- 2.19 The **human resources capacity component (US\$88 million)** will include two subcomponents: (i) research and development projects for the relocation of researchers (PIDRIs) promoting the entry of researchers into R&D centers; and (ii) doctoral training programs in priority technological areas (PFDTs), aiming to build capacity in human resources involved in R&D in priority technological areas. Projects may be proposed by nonprofit public and private institutions with R&D activities.
- 2.20 Programs will be selected through periodic public announcements. Applying institutions will present a PI that will include a capacity enhancement plan and the R&D activity development program. For PIDRIs, requirements will include the profiles and characteristics of the research positions to be established, and the profiles of the PICTs to be conducted by the researchers to be relocated. For PFDTs, requirements will include the alternative doctoral and research programs desirable within the framework of the enhancement plan.
- 2.21 In the project development stage for the selected PIs, bidders will choose between two alternatives: (i) explicit identification of the researchers to be hired and/or trained, or (ii) determination of the profiles of the researchers to be hired and/or trained during project execution. In the latter case, the beneficiary institution, under the supervision of FONCYT, will hold public competitive processes to ensure the integrity of the examining boards, the broadest dissemination of their purpose, and a rigorous selection based on the background of the researchers to be hired and/or trained.
- 2.22 For PIDRIs, the program will finance up to 50% of the labor cost of the researchers to be hired, for a maximum period of four years, on a decreasing scale. Moving expenses will also be financed for researchers from abroad or those who relocate within the country, and up to one PICT may be financed for each researcher hired. The maximum financing of this subcomponent will be US\$1,500,000 per beneficiary institution.
- 2.23 Financing for a PFDT will consist in a grant of up to 70% of the total cost of the project. To access the benefit, the beneficiary institution will issue a public call to candidates for doctoral training. The maximum limit for financing by the program will be US\$1 million per beneficiary institution. The beneficiary institution will guarantee conditions promoting the activities of the grant recipients and their incorporation into the institution throughout the execution of the PFDT and after its completion.

3. Subprogram III: Institutional strengthening of institutions in the National Innovation System (US\$8.5 million)

- 2.24 The purpose of this subprogram is to contribute to the consolidation and enhancement of Science and Technology Organizations (STOs) by supporting

external evaluations and the implementation of the enhancement plans derived from them. The subprogram includes two components: (i) institutional evaluation of STOs, and (ii) institutional consolidation of STOs.

- 2.25 **External evaluation of STOs component (US\$1.5 million).** Beneficiaries of this component will be the STO members of the Interagency Council on Science and Technology (CICyT) that agree with SECYT to implement institutional evaluation processes. For each external evaluation, the program's support will consist in a grant for up to US\$150,000. The purpose of the external evaluation is to have an independent assessment by experts in the field, who will analyze the processes and results obtained by the STOs over a specific period, evaluate the program of actions for improvement presented by the STO, and recommend courses of action to enhance the institution. SECYT will appoint an external evaluation committee for each STO selected, which will be made up of at least four evaluators, two of whom must be foreign nationals. The evaluators must have a recognized track record in scientific and technological management, as well as in applying and obtaining successful experience in the field of applied science. The evaluation committee will also include experts in institutional management and end users of the organizations' products.
- 2.26 **The STO management enhancement plan implementation component (US\$7 million)** will support processes consolidating the management of STOs through grants for the execution of enhancement plans derived from the institutional evaluations and approved by the Office of the Secretary of State or the authority governing each organization. Projects eligible for financing include: (a) consulting aimed at modernizing institutional management (including environmental management); (b) strengthening of human resources through staff training and education; and (c) computer hardware and software for management support. The amount to be financed for this last item may not exceed 40% of the total project cost. For implementation of the enhancement plans, a grant of up to US\$400,000 will be made. The beneficiary STO will contribute counterpart resources representing at least 50% of the cost of implementing the enhancement plan.

B. Cost and financing

- 2.27 Table II-1 shows the total estimated cost of the program and the proposed financing. Bank financing represents approximately 55% of the total program cost, which would be committed over a term of four years, with a disbursement period of four and one-half years.

Table II-1 Total program cost and financing (in millions of US\$)					
Investment categories		Bank	Local	Total	%
1	Administration and evaluations	7.5	6.5	14.0	2.7%
1.1	Administration	7.0	6.0	13.0	2.5%
1.2	Evaluations	0.5	0.5	1.0	0.2%
2	Direct costs	270.5	193.0	463.5	90.9%
2.1	<u>Subprogram: Productive sector innovation</u>	<u>120.0</u>	<u>75.0</u>	<u>195.0</u>	<u>38.2%</u>
2.1.1	Technological innovation component	90.0	65.0	155.0	30.4%
2.1.2	Productive sector alliance-building component	30.0	10.0	40.0	7.8%
2.2	<u>Subprogram: Consolidation of R&D capacity</u>	<u>145.0</u>	<u>115.0</u>	<u>260.0</u>	<u>51.0%</u>
2.2.1	Building S&T capacity component	100.0	72.0	172.0	33.7%
2.2.2	Human resources capacity component	45.0	43.0	88.0	17.3%
2.3	<u>Subprogram: Institutional strengthening of organizations in SNI</u>	<u>5.5</u>	<u>3.0</u>	<u>8.5</u>	<u>1.7%</u>
2.3.1	External STO evaluation component	1.4	0.1	1.5	0.3%
2.3.2	STO management enhancement plan implementation	4.1	2.9	7.0	1.4%
3	Unallocated costs	2.0	0.5	2.5	0.5%
3.1	Contingencies	2.0	0.5	2.5	0.5%
4	Financial costs	0.0	30.0	30.0	5.9%
4.1	Interest	0.0	28.0	28.0	5.5%
4.2	Credit fee	0.0	2.0	2.0	0.4%
4.3	Inspection and supervision	0.0	0.0	0.0	0.0%
	TOTAL	280.0	230.0	510.0	100%
	Percent	55%	45%	100%	

III. PROGRAM EXECUTION

A. Borrower and executing agency

- 3.1 The borrower will be the Argentine Republic, and the executing agency will be Secretariat of Science, Technology, and Productive Innovation (SECYT) of the Ministry of Education, Science, and Technology (MECYT). SECYT will delegate responsibility for the execution of subprograms 1 and 2 to the National Agency for the Promotion of Science and Technology (“the Agency”), and will delegate execution of the technical aspects of subprogram 3 to its National Department of Planning and Evaluation (DNPE). Supervision of the actions to strengthen the Agency, included under the Administration line item, will be the responsibility of the Office of the President of the Agency.
- 3.2 The Agency has two line units, FONTAR and FONCYT, and two support units, the Financial-Administrative Functional Unit (UFFA) and the Management and Legal Affairs Control Unit (UCGAL). In addition, the Institutional Promotion Unit has been publicizing and promoting the Agency’s services since 2004, and is currently setting up a Transfer and Intellectual Property Unit (UTYPI) to promote these issues among SMEs and S&T institutions. The Agency is headed by a president, who reports to a Board of Directors.¹⁰
- 3.3 The Agency has satisfactorily managed prior Bank programs with its current organizational structure, which will be maintained for TMP III. Nevertheless, TMP III represents a significant change in terms of both the volume of planned operations and new lines of support. Between 2001 and 2005 the Agency executed an annual average of US\$51.4 million, increasing to US\$89.7 million between 2004 and 2005. Although the historical average is influenced by the crisis in 2002 and 2003, the projected average annual investment for TMP III is US\$102 million. Given this increase and the introduction of new lines,¹¹ the program will include: (i) strengthening of the Agency’s management systems through the modernization of the information system for management and control, and the expansion of quality control; and (ii) progressive staffing increases in key areas of the Agency over the course of program execution.
- 3.4 With support from TMP II, the Agency has started to review the FONTAR management system. This effort will be complemented with TMP III so that, beginning in 2006, it includes an integrated operation processing system and the measurement of management using operational indicators and milestones in the

¹⁰ The Board of Directors has nine members, including the President of the Agency. Board members are required to have a background in science, technology, or business. Directors are proposed by MECYT, generally in consultation with the sector institutions.

¹¹ PICT startup, PAE, PIDRI, and PFDT in FONCYT, and PI-TEC and two variations of CAE in FONTAR.

system, integrates operating and accounting information, and allows online connections with large clients or administrative units. For its maintenance and to respond to user requirements, an Information Systems Unit (USI) will be organized in the Agency. The strengthening of this area also includes the development of a database for human resources, studies, and R&D research and work in the S&T sector.

- 3.5 The increased operations will require greater quality control, so an Evaluation and Quality Assurance Unit (UEAC) and a Socioenvironmental Management Unit (UGSA) will be added and report to the president of the Agency. Their duties are summarized in paragraphs 3.10 and 3.11, and the support for the organization and work of these units (equipment, training, etc.) is included in the [Agency's Institutional Capacity-building Plan](#).
- 3.6 Based on the projected increase in projects and the needs analysis for management of this increase, a progressive increase of 37 Agency staff members is anticipated (from the current total of 103 to a total of 140 by the end of the execution period), to be distributed as follows: ten in FONCYT, seven in FONTAR, four in UFFA, two in the Transfer and Intellectual Property Unit, and 14 in the new units.

B. Program execution structure

1. At the National Agency for the Promotion of Science and Technology

- 3.7 For their respective subprograms, FONCYT and FONTAR will be responsible for: (i) preparation of annual work plans; (ii) the process of evaluation, selection, and awarding of financing; (iii) financial and technical monitoring of projects, including preparation of the technical progress reports required by the Bank. For CAE projects, FONTAR will also be responsible for negotiating subsidiary agreements with participating financial institutions and coordinating the processing and monitoring of operations with them. The current fund structures will be maintained: FONCYT has a Project Evaluation Department and a Monitoring Department, under the supervision of a Director General, and FONTAR has a Management Department and an Evaluation Department, under a Coordinator General.
- 3.8 For its part, UFFA will be responsible for: (i) preparation of budgets, annual financial statements, and periodic financial progress reports; (ii) timely securing of loan and counterpart resources; (iii) disbursements for projects under the various lines of financing; (iv) financial monitoring of projects; (v) supporting beneficiaries on compliance with procurement rules; and (vi) establishment of internal financial controls. To do this, UFFA will maintain its current structure.
- 3.9 UCGAL currently has two departments: a Legal Department and a Management Control Department, responsible for the review of legal issues and internal auditing, respectively.

- 3.10 The Evaluation and Quality Assurance Unit (UEAC) will be responsible for: (i) the periodic evaluation of program management and impact, including the collection and maintenance of its indicators and baselines; (ii) centralization, standardization, and updating of all manuals, operating regulations, instructions, or guides produced by the Agency for internal use or use by project beneficiaries; (iii) preparation of guides for program evaluation, including the periodic revalidation of indicators; and (iv) preparation of terms of reference and supervision of consultants hired for evaluations. This unit will be responsible for the organization and performance of the midterm and final evaluations to be included in the program.
- 3.11 For its part, UGSA will implement the environmental management strategy developed for the new operation (see paragraphs 4.9 to 4.12). UGSA will develop and monitor environmental indicators, provide technical assistance to FONTAR and FONCYT staff in the environmental evaluation and monitoring of the projects, perform the socioenvironmental evaluation of projects using samples (including compliance with health and safety standards), and develop measures to improve the socioenvironmental dimension in TMP III. **As a condition precedent to the first disbursement of the loan proceeds, the Information Systems Unit, Evaluation and Quality Assurance Unit (UEAC), and Socioenvironmental Management Unit (UGSA) must have been established at the Agency, reporting to the Office of the President. Continued loan disbursements will be contingent upon the following conditions being met within the respective deadlines: (i) coordinators have been hired for these three new units within three months after the loan contract signature date; (ii) all professional staff have been hired for the units within six months after the loan contract signature date.**

2. At the National Department of Planning and Evaluation (DNPE)

- 3.12 The DNPE Coordination and Evaluation Office will be responsible for the process determining eligibility, approving financing, and monitoring the activities of subprogram 3, which will finance external institutional evaluations and the implementation of enhancement plans arising from these evaluations. The review of the quality of the evaluations and enhancement plans will be assigned to an advisory board of five experts. Financial and accounting activities will be the responsibility of UFFA. Since the Coordination and Evaluation Office has just three employees, the program includes consulting resources to be used as needed to support the management work in this office.

C. Method of execution

- 3.13 **FONCYT lines of financing.** FONCYT's basic mode of operation is the awarding of grants to projects presented in response to public announcements, according to the procedures described in the OR. The evaluation process begins with an admissions examination by FONCYT, based on criteria issued publicly in the announcements. Projects are classified in 16 scientific disciplines, and for their

evaluation, in each of the areas, the Agency selects a coordinator and two assistant coordinators who are recognized researchers in their respective fields. For the evaluation of each project, these coordinators select at least three peer evaluators.

- 3.14 Thus, the quality of the projects admitted is evaluated by peer review, with the coordinators controlling the timeliness of the peer response. The evaluation is then reviewed by the ad-hoc commission in each area, made up of recognized researchers. These commissions also evaluate the relevance of the projects, and based on the determination of merit (combination of quality and relevance), they make their recommendation to the Agency's Board of Directors. The system is transparent yet allows confidentiality for those aspects where it may be necessary.
- 3.15 The Agency will make semiannual disbursements to each project according to their execution schedules. The first disbursement will be an advance, corresponding to the expenses projected in the first six months, to be made after the contract is signed. Upon application of 75% of the advance, the Agency will complete the disbursement for the first year. In order to authorize the disbursement for the first six months of successive years, the Administrative Unit must have applied 75% of the funds received, documented receipt of counterpart contributions, and filed technical progress reports for each responsible researcher approved by FONCYT.
- 3.16 **FONTAR lines of financing.** FONTAR's evaluation process also uses external evaluators, an ad-hoc commission, and quality, relevance, and merit criteria, but since it largely deals with business projects, it differs from FONCYT as follows: (i) the quality criteria also use estimates of financial feasibility, market potential, and availability of resources to ensure execution; and (ii) the evaluators are experts in business analysis and receive a stipend. As in the case of FONCYT, the evaluation is reviewed by the ad-hoc commission, which operates on a pro bono basis and submits recommendations to the Agency's Board of Directors.
- 3.17 The monitoring activities are similar to those of FONCYT in terms of the conditions to be met and reports to be filed. However, beneficiaries of FONTAR's NRCs will not receive advances and must use their own capital, for subsequent reimbursement upon verification of expenses. In this way, the benefits provided by FONTAR will be provided in cash as reimbursements for payments made, upon prior verification and technical approval of the stage and/or activity included in the project work plan, the expense reporting to accompany the technical report, and the counterpart disbursements indicated in the expense schedule.
- 3.18 In the case of the enterprise lines of credit (CAE I and CAE II), the channeling of subprogram resources is handled through Intermediary Financial Institutions (IFI) using an open window. For CAE I, the credit risk and financial evaluations will be performed by the IFI, while the technical evaluation will be done by FONTAR. For CAE II, these evaluations will be conducted jointly. In both cases, the disbursements to the projects will be made based on previously agreed upon

execution schedules, and the IFIs will administer the portfolio and the recovery of any delays, and will process the disbursements. For the CAE-FT line, within the framework of the Trust, a Technology Fund Management Committee will be established, made up of two representatives of the Agency, two representatives of the financial institution, and two representatives of the trustee. This committee will have an evaluation section and a monitoring section. The evaluation section will determine project eligibility and will process contracts and guarantees. The monitoring section will monitor progress of execution, prepare operational and financial reports, and will monitor amortization, taking action in the event of late payment. **The signature and entry into force of the first contract with the IFIs will be a condition precedent to the first disbursement of resources for the CAE I and CAE II lines in the technological modernization subcomponent (loan) under subprogram I, and the signature and entry into force of the trust contract will be a condition precedent to the first disbursement of resources for the CAE-FT line.**

D. Operating Regulations and program manuals

- 3.19 The execution of all of this operation's lines of financing will be governed by the OR, which incorporate the adjustments from the lessons learned in the execution of TMP II and detailed procedures for all of the lines included in TMP III. The Agency and the project team have reached a consensus and agreed on the content of the OR, including: criteria for project selection and activities eligible for financing; requirements for the analysis of the proposals submitted; criteria for the selection and procurement of goods and services; use of resources and restrictions; transfer methods; terms and conditions governing project execution; execution periods; and the definition of monitoring and control characteristics. The OR also include an Environmental Annex specifying mechanisms and procedures to evaluate and monitor the socioenvironmental aspects of TMP III. **The submission by the Agency of evidence of the entry into force of the program's Operating Regulations will be a condition precedent to the first disbursement of financing.**
- 3.20 The Agency has procedure manuals for FONTAR, FONCYT, UCGAL, and UFFA. These manuals contain the procedures applicable to each of the lines and the responsibilities of the various units. The Agency also has an Operations Management Manual prepared by UFFA for use by beneficiaries, with instructions on accounting and procurement issues. The preparation and maintenance of the manuals and OR will be centralized in UEAC (see paragraph 3.10).

E. Procurement

- 3.21 The program includes the procurement of goods and related services. Procurement will be conducted in accordance with "Policies for the procurement of works and goods financed by the IDB" (document GN-2349-4) and "Policies for selection and

contracting of consultants financed by the IDB” (document GN-2350-4), both dated January 2005.

- 3.22 Goods with an estimated cost greater than or equal to US\$500,000 will be procured by international competitive bidding (ICB), those with an estimated cost greater than or equal to US\$100,000 by national competitive bidding (NCB), and those under US\$100,000 by the shopping method. For consulting services with estimated contract amounts under US\$500,000, the shortlist may comprise entirely national consultants.
- 3.23 For the sake of continuity, we propose contracting of the team of consultants who supported the Agency in the execution of TMP II, and were selected and contracted in accordance with Bank policies and procedures.
- 3.24 For private sector beneficiaries, Bank policies will apply to private sector procurement, specifically as they relate to the appropriate, efficient, and economic use of resources, and eligibility of goods, works, and services. Stated another way, competitive methods will be used to ensure procurement at market prices.
- 3.25 Considering the successful experience in the execution of TMP II,¹² it has been determined that all goods procurement under the ICB limits and consulting contracts under US\$500,000 will be subject to post review by sampling. Prior to any request for proposals or the procurement of goods or consulting services, the executing agency will submit the procurement plan to the Bank for its review and approval. It will include the estimated cost of the contracts and projects, the grouping of processes, sources of financing, applicable selection methods and criteria, and the method of review by the Bank. This plan will be updated every 12 months for the following 18 months of execution, and submitted each time for the Bank’s review and approval (see [Procurement plan for the first 18 months](#)).

F. Execution period, timetable, and disbursement procedures

- 3.26 The resources will be committed for four years, and the disbursement period will be four and one-half years. Table III-1 shows the planned execution schedule for the program.

¹² During execution of TMP II, the Bank performed a post review, using samples, on all procurements of goods under US\$200,000 and of consulting services under US\$100,000.

Table III-1
Program execution schedule (in thousands of US\$)

Source	Year 1	Year 2	Year 3	Year 4	Year 5	Total
IDB	51,000	71,000	67,000	56,000	35,000	280,000
Local contribution	34,000	49,000	55,000	60,000	32,000	230,000
Total	85,000	120,000	122,000	116,000	67,000	510,000
%	16.7	23.5	23.9	22.7	13.2	100.0

- 3.27 The disbursement mechanism for TMP III will generally follow the practices and procedures used in TMP II. Given the decentralized nature of the execution of the projects financed, the Bank will continue to consider expenses eligible under the projects approved by FONCYT, FONTAR, and, beginning with TMP III, DNPE, provided that: (i) each of these agencies certifies that they have followed the procedures on such matters specified in the OR; and (ii) the expenses are related to the investment categories approved for each line.
- 3.28 For the lines executed through Administrative Units (PICT and PICTO), for purposes of presentation to the Bank, the receipt issued or documentation of transfers made to these units will be considered evidence of disbursement, subject to subsequent verification of the use of such funds. For the other lines, the receipt issued by the beneficiary, documentation of transfers to beneficiaries, or receipts for direct payments to suppliers with the relevant supporting documentation will be considered evidence of disbursement for submission to the Bank. Bank policies and procedures for global credit loans (OA-325) will be followed for the technological modernization (loan) subcomponent.

G. Recognition of expenditures

- 3.29 TMP III will continue projects approved under TMP II, following rules and procedures agreed upon with the Bank. The amount to be disbursed to these projects, as of 1 January 2006, totals US\$41 million in financing and US\$25.5 million in counterpart contributions. The executing agency has requested recognition of up to US\$9.2 million equivalent against the local counterpart, and up to US\$18 million equivalent against the financing, as expenditures covered by TMP III resources for notices to submit such projects in the 18 months prior to program approval.

H. Program monitoring, supervision, and evaluation

- 3.30 Supervision will be done by the Bank's Country Office with project team support, based on the annual work plans (AWPs) to be prepared at the start of each year, the semiannual operational progress reports, which will use compliance with the commitments set in the logical framework as a reference, and the annual financial reports. Based on these reports, joint evaluation meetings will be held between the Agency and the Bank within 60 days after their receipt. Through the UEAC, the

Agency will also prepare a semiannual evaluation report on the progress of the subprograms, relating them to the AWP and analyzing variations and actions required to ensure satisfactory execution. The second semiannual report for each year will be submitted together with the AWP for the following year. The first evaluation report will specifically include a detailed description of implementation progress on the Agency's Institutional Capacity-building Plan.

- 3.31 The program will have a monitoring and evaluation system (MES) that will be the responsibility of UEAC. It will record the program's baseline and measure progress toward the targets for each of the logical framework indicators. The MES also includes a monitoring and evaluation procedures manual that identifies the terms, responsible parties, frequency, resources, and methodologies used to measure each logical framework indicator and analyze program performance. UEAC will also monitor the Agency's management indicators¹³ and perform sector studies and operational audits covering procedural aspects and technical quality control (transparency, consistency, compliance with best management practices, ethical issues, adaptation to the program's final objectives, midterm evaluations, impact assessments, etc.). Monitoring of the program's socioenvironmental indicators and considerations will be the responsibility of UGSA.
- 3.32 The Agency plans to develop a management control information system to integrate all of its scheduling, execution, and monitoring functions for both FONTAR and FONCYT. The system will be operated by the Agency's Information Systems Unit and will enable UEAC to manage the monitoring and evaluation information on the indicators associated with the program's goal, purposes, components, and activities.
- 3.33 A schedule has been agreed upon for external midterm and final evaluations to complement the continuous monitoring and evaluation activities. The midterm evaluation will take place 24 months after the loan contract signature date, or once 50% of the loan proceeds have been disbursed, whichever occurs first, in order to: (i) determine progress in meeting the indicators included in the logical framework; (ii) review the operation of the new lines of financing; (iii) evaluate the implementation and operation of the management control information system; and (iv) propose actions to improve program progress. The final evaluation will be done once at least 80% of the loan proceeds have been disbursed, or during the last three months, whichever occurs first, in order to: (i) determine the level of compliance with the indicators; (ii) evaluate the level of execution of the various subprograms; (iii) weigh strengths and weaknesses in the design and execution of the operation so as to move national objectives in the sector forward; and (iv) document lessons learned for future projects. International consulting services will be engaged for these evaluations under terms of reference agreed upon in advance between the

¹³ The [Agency's Institutional Capacity-building Plan](#) defines a set of management indicators for efficiency, effectiveness, quality, and impact, in addition to those included in the logical framework, that will be monitored continuously by UEAC.

Agency and the Bank's project team. The project team will conduct two administrative missions, the first 15 months into program eligibility, and the second at 30 months.

- 3.34 It is important to note that the impact assessment methodology for TMP II resulted in the development of a series of methodological lessons that have been incorporated into the design of the logical framework and indicators for TMP III. Thus, the new monitoring and evaluation system will allow new data to be more easily obtained for future impact assessments, using the periodic surveys of the National Statistics and Census Institute (INDEC) and the information to be recorded in the Agency's new management control information system. The Agency has agreed to finance a post review within two years following the last program disbursement, using methodologies analogous to those used in the evaluations performed by the Bank for TMP II, and in accordance with international best practices.

I. Audits and revolving fund

- 3.35 An external audit of TMP III will be done every six months by an independent audit firm acceptable to the Bank. Duly audited semiannual financial statements will be delivered to the Bank within 120 days following the close of each six-month period.
- 3.36 A revolving fund will be opened for program disbursements in an amount of up to 5% of the Bank loan proceeds. The Agency will present semiannual status reports on the revolving fund within 60 days following the close of each six-month period.

IV. VIABILITY AND RISKS

A. Institutional viability

- 4.1 TMP III is the third science and technology (S&T) project financed by the Bank in Argentina. Except for the new instruments introduced in this operation, the three TMP programs have similar characteristics in terms of execution mode and mechanisms, which have been satisfactorily applied since 1996 by the Agency in its capacity as executing agency of the previous programs. This experience in executing programs substantially similar to those of TMP III is strengthened by the solid knowledge of Bank requirements and policies that the Agency has acquired over the last decade. This experience and knowledge were reflected in the result of the application of the Institutional Capacity Assessment System (ICAS) tool, during program preparation, in which the Agency had an overall, weighted result of “low risk,” and “developed” institutional development.
- 4.2 With respect to the National Department of Planning and Evaluation (DNPE), which will be responsible for execution of subprogram 3, although it has not executed programs with the Bank before, it is worth noting that it has experience in matters of institutional assessment. Moreover, for the execution of this subprogram, it will benefit from the experience of UFFA, which is responsible for the administrative-financial aspects. Finally, to strengthen the institutional viability of the subprogram, the following has been agreed: (i) the inclusion of an advisory board for quality control; and (ii) specialized consulting resources for support in monitoring and evaluation tasks.
- 4.3 In short, the Agency’s structure has proven adequate, and will be maintained for the execution of the new operation. Furthermore, human resources and systems are being reinforced with a view toward building the institution’s capacity to manage the increased operations planned in TMP III (see the [Agency’s Institutional Capacity-building Plan](#)). Therefore, the new program is considered viable from an institutional point of view.

B. Financial viability

- 4.4 As shown in table IV-1, which summarizes Agency investments during 2002-2005 within the framework of TMP II, total investments for this period grew more than 466%, thus confirming the Agency’s capacity to execute growing and significant levels of investment. This growth was pronounced in the case of the local counterpart, which increased almost 11 times with respect to its base year.¹⁴

¹⁴ For further details on this counterpart contribution and its projected composition for the program’s execution period, see the document [Local Counterpart Components in the Program](#).

TABLE IV-1
Budgetary execution of the Agency 2002– 2005
(in thousands of US dollars)

	2002	2003	2004	2005
IDB	13,000	16,000	36,000	50,000
Local contribution	5,000	9,000	41,000	53,000
Total	18,000	25,000	77,000	103,000
Index: 2002=100	100.00	142.32	421.28	566.33
Local contribution index	100.00	197.56	848.38	1,099.10

- 4.5 The fact that TMP III is the Bank's third operation with the Agency is evidence of this entity's continued, strong political support and the Argentine government's commitment to its mission to promote the various S&T fields in the country. This support, together with the noteworthy budget increase in recent years, ensures the new program's financial viability.

C. Socioeconomic viability

- 4.6 The program's socioeconomic viability is based on the potential to articulate a national system of science, technology, and innovation contributing to the competitiveness of the private sector through the generation of knowledge and innovation that enhance productivity and develop new products and processes that are competitive on international markets.
- 4.7 As a basis for estimating the program's socioeconomic viability, the incremental benefits generated by a sample of ten enterprise projects financed through NRCs executed beginning in 2001 were evaluated.¹⁵ These projects were selected for their high expected impact, and although they cannot be considered entirely representative, they are evidence of projects financed with NRCs, that in the Agency's opinion, have been successful. According to a portfolio approach analogous to the one used for venture capital, and assuming that the other projects financed by FONTAR did not result in negative incremental impacts, the evaluation of this sample of projects allows a post review of whether the most successful cases generated net incremental benefits greater than the total costs of the entire FONTAR portfolio, which would justify the investment made.

¹⁵ CENIT, "*Programa de ANRs del FONTAR: Una Evaluación de Beneficios Sociales a través de Estudios de Caso*" [FONTAR NRC Program: An Evaluation of Social Benefits through Case Studies], 2006. For 10 projects, present value revenues discounted to 2005 were considered between 2001 and 2010, using observed sales and costs, and estimating the flows between 2006 and 2010. In a hypothetical scenario "without NRCs," the economic benefits were calculated for projects that would not have been executed without NRCs, or that would have been undertaken with delays, where the NRC generated an advance on the flows.

- 4.8 The results of the economic evaluation of the sample projects indicate that it is sufficient to consider the benefits attributable to ten projects executed between 2001 and 2005, to largely offset (by a factor of more than four times) the total cost of the NRC program during the same period. This demonstrates the high socioeconomic viability of the NRC line (internal rate of return of 37%), whose benefits, projected in advance for the portfolio of projects to be executed during TMP III, and even using conservative assumptions, would be sufficient to justify the total investment in all of the new program's lines. Moreover, all of the projects in the sample generated a positive private value-added greater than the financial contribution by the beneficiaries, demonstrating the financial viability of the projects and their counterpart contributions.

D. Socioenvironmental viability

- 4.9 The project team has determined that the operation is viable from a socioenvironmental point of view. In general, the projects will be small-scale laboratory and pilot programs, and new product prototype development projects. The infrastructure in projects related to modernization of laboratory equipment is limited to updates and modifications to existing structures in order to accommodate newly purchased equipment. Based on the socioenvironmental impact assessment for TMP II and the analysis of potential project profiles under the new TMP III instruments, no significant negative environmental or social impacts are expected. However, some projects may pose environmental risks if they fail to observe current environmental regulations or lack the controls and means of mitigation to handle waste, emissions, and wastewater, and to minimize any damage to ecosystems.
- 4.10 To avoid such potential risks, a socioenvironmental management strategy will be implemented through the new Environmental Management Unit (UGSA). The strategy will cover the following elements, which have also been incorporated into the OR and the Agency's Institutional Capacity-building Plan: (i) Projects will be required to meet the established environmental standards (see the [Socioenvironmental Annex](#) to the program OR), and No projects with significant adverse impacts will be financed; (ii) procedures and instruments will be established to ensure that potential socioenvironmental impacts and project sustainability are assessed, for which purpose categories of environmentally high-risk projects have been identified and listed in the OR; (iii) UGSA will develop a monitoring program to determine whether the environmental assessment and monitoring process is sufficient and propose solutions, if necessary; and (iv) The environmental management strategy includes the identification of environmental indicators, to assess the program's environmental impact. The semiannual reports will include information on such indicators.
- 4.11 In TMP II, a significant proportion of the projects financed by FONCYT, and a lower proportion of the FONTAR projects, were specifically environmental in

nature. For example, projects addressed technologies for processing industrial wastewater; technologies to control atmospheric emissions; studies on water pollution; development of useful products through the reuse of industrial waste; development of organic production and integrated pest management models in the agricultural sector; solar energy technologies; development of biological pest control technologies, among many others. These types of technologies and research, if adopted, may have very positive social and environmental impacts. It is expected that TMP III will continue to finance projects of this type, and that the proportion of projects aimed at the development of clean technologies and/or solutions to address environmental problems may even increase, particularly through FONTAR. The Bank is preparing a new loan operation with the Clean Production Unit at the Ministry of the Environment and Sustainable Development to support SMEs in developing clean production plans, so they are able to submit projects eligible for financing to FONTAR. The Agency is considering the possibility of issuing special calls for clean production in cooperation with this Ministry. To ensure proper treatment of clean production projects, FONTAR will also have an expert consultant to support the management of special calls and the evaluation of the projects submitted.

- 4.12 No negative social impacts were detected in TMP II, and therefore, no such impacts are anticipated as a result of implementing the new operation. For project selection, the OR include criteria prohibiting discrimination based on gender or ethnicity. During execution of the operation, UGSA will monitor these aspects for each subprogram.

E. Benefits and beneficiaries

- 4.13 The program will build Argentina's S&T capacity, by consolidating the achievements of the prior programs. The program has been designed to promote the relevance of scientific research projects, the links between research centers and the potential users of their results, and innovation and technological development within the SME beneficiaries. Building and leveraging the country's scientific and technological capacity requires boosting the demand and interest of its productive agents, so that this capacity can yield the expected benefits for society. To do this, the program includes a set of actions to promote, encourage, and facilitate the linkage of enterprises, particularly SMEs, with the primary sources of scientific and technological information and knowledge.

F. Risks

- 4.14 During program preparation, the Agency's broad experience in the promotion and administration of R&D projects was confirmed, for both the academic and productive sectors. Its experience with the previous programs has allowed it to streamline the program's execution system, minimizing execution risks, ensuring

the technical quality of the subproject evaluation processes, and guaranteeing proper, timely financial administration of the resources.

- 4.15 The program incorporates new instruments (PI-TECs and PAEs) the management of which may represent a risk, since they require a more proactive stance and greater coordination. This risk is minimized by the following factors: (i) the new lines include a stage for the presentation of project ideas allowing the analysis of potential projects and the allocation of funds for the preparation and coordination of detailed bids for those projects with the greatest innovative and scientific merit; (ii) bidding guidelines have been designed for the new lines as a complement to the OR, using a sample of potential projects as a reference; and (iii) although the new mechanisms allow the submission of bids integrating the various FONTAR and FONCYT support tools, the requirements and processes for the evaluation and selection of the subprojects contained in the proposals will be the same as those used for projects presented individually.
- 4.16 Finally, the TMP III financing line incentive framework, established in the program's Operating Regulations, has been carefully designed to lead to specific changes in the behavior of participants in Argentina's SNI, in terms of its scientific production, the level of academic collaboration, R&D and technological modernization investment decisions, the capacity for productive coordination, and protection of the environment. For this reason, the OR include detailed procedures for the submission, selection, and monitoring of projects, evaluation criteria, execution mechanisms, environmental safeguards, and limits and percentages of cofinancing for each of the program's lines. All of these parameters were designed based on the experience acquired by the Agency in prior programs, the impact assessments undertaken during preparation of TMP III, good international practices, and the lessons learned by the Bank and other international organizations (see paragraph 3.19). The program also includes resources for the establishment of an Evaluation and Quality Assurance Unit, whose function will be to continuously ensure effective and efficient management in the Agency and compliance with the principles and procedures of this incentive framework. These functions are critical for the program's successful implementation, since experience shows that apparently minor deviations or changes in the application of the program's incentive framework can produce considerable adverse effects. In this context, one risk inherent in the specific program is that during program execution, the incentive framework for its financing lines is modified, without considering the above-mentioned technical aspects or the potential negative effects that these potential changes could have. To mitigate this risk, during program preparation, meticulous work was done to build consensus and agree with the Agency on the complete content of the OR (including the socioenvironmental aspects).

TECHNOLOGICAL MODERNIZATION PROGRAM III (AR-L1012) LOGICAL FRAMEWORK

Program Goal To contribute to building the country's capacity in science and technology so as to address priority sector and social problems and heighten the Argentine economy's structural competitiveness.		
Program Purpose = Subprogram Goal To contribute to strengthening the National Innovation System and the Regional Innovation Systems by increasing the innovative and associative capacities of their participants, contributing to the development of a modern scientific and technological infrastructure.		
<i>Subprogram 1</i> Consolidation of innovation in the productive sector Objective: <i>To contribute to the strengthening of the National Innovation System and the Regional Innovations Systems through consolidation and expansion of the productive sector's technological innovation capacity.</i>	<i>Subprogram 2</i> Consolidation of R&D capacity Objective: <i>To contribute to the strengthening of the National Innovation System and the Regional Innovations Systems through consolidation and expansion of the capacity to generate scientific and technological knowledge in thematic, priority, and strategic areas.</i>	<i>Subprogram 3</i> Institutional strengthening of science and technology organizations Objective: <i>To contribute to the strengthening of the National Innovation System and the Regional Innovations Systems through strengthening of the institutional framework and national science and technology organizations.</i>
Components 1. Building technological innovation capacity in the productive sector. 2. Promoting alliance-building to resolve technological problems in productive clusters.	Components 1. Building and consolidating scientific and technological capacity. 2. Expanding and building R&D human resources capacity in priority areas.	Components 1. Institutional evaluation of science and technology organizations (STOs). 2. Supporting the institutional consolidation of science and technology organizations.

TECHNOLOGICAL MODERNIZATION PROGRAM III (AR-L1012)
LOGICAL FRAMEWORK

NARRATIVE SUMMARY	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
GOAL			
The goal of the program is to build Argentina's capacity in science and technology so as to address priority sector and social problems and contribute to sustainable gains in productive sector competitiveness and productivity through development of a new manufacturing model based on more technology-intensive goods and services.	<p>For post review, with respect to the baseline, two years after completion of the program:</p> <ol style="list-style-type: none"> 1. Improvement of the ranking in the World Economic Forum's growth competitiveness index (GCI) (2005 baseline: 72 out of 116 countries, with an absolute GCI value of 3.56). 2. Improvement of the ranking in the World Economic Forum's innovation subindex (2005 baseline: 34 out of 116 countries, with an absolute value of 3.18). 3. Improvement in the average ranking obtained for the following questions on the World Economic Forum's <i>Global Competitiveness Report</i>: 3.01; 3.02; 3.05; 3.06; 3.07; 3.08, and 3.09 (2005 baseline: 3.743). 	<i>Global Competitiveness Report</i> , by the World Economic Forum.	A stable political and macroeconomic environment.
PURPOSE			
The purpose of the program is to contribute to strengthening the National Innovation System and the Regional Innovation Systems by increasing the innovative and associative capacities of their participants, contributing to the development of a modern scientific and technological infrastructure that supports national efforts aimed at generating knowledge useful for the various activities and sectors in Argentine society.	<p>By the end of the program, with respect to the baseline:</p> <ol style="list-style-type: none"> 1. Contribution of at least one fourth of the target increase (50%) in the percentage of GDP invested in R&D (2004 baseline: 0.44% of GDP). 2. Contribution of at least one fourth of the target increase (20%) in the percentage of GDP invested in R&D financed by the private sector. (2004 baseline: Enterprises: 32.9%, Total private sector: 35.3%). 3. A 10% increase in the average rate of articles published per year by researchers financed by the program in indexed reviews. (Baseline: information provided by researchers in FONCYT announcements and after the end of the program). 4. A 13% increase in the number of fulltime equivalent researchers in engineering, exact and natural sciences, in the R&D units participating in the program. (Baseline: information provided by executing units submitting projects). 	<p>SECyT indicators.</p> <p>SECyT indicators.</p> <p>National Survey on Innovation and Technological Conduct.</p> <p>SECyT indicators;</p> <p><i>Science Citation Index</i>.</p> <p>FONCYT database.</p> <p>FONCYT database.</p>	<p>The government maintains interest in strengthening the National Innovation System.</p> <p>The productive sector maintains interest in, and capacity to invest in, innovation.</p>

NARRATIVE SUMMARY	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
	5. A 25% increase in the number and total value of projects involving a partnership between R&D centers and enterprises, with respect to the total number of projects financed by the Agency in the PICTO and PID lines. (2005 baseline: (i) PID, 28 projects; PICTO, 13 projects; (ii) Enterprise financing /Total Agency grants on lines: PID 36.5%; PICTO 5.2%).		
SUBPROGRAM 1: Consolidation of innovation in the productive sector			
OBJECTIVE			
To consolidate and expand the productive sector's technological innovation capacity within the framework of the National Innovation System (SNI).	<p>By the end of the program, with respect to the baseline:</p> <ol style="list-style-type: none"> A 20% increase in the R&D investment rate with respect to sales in the group of enterprises benefiting from program projects (Baseline: estimated based on information provided by each firm upon submission of the project). A 15% increase in the ratio of technically qualified personnel and total staff of enterprise beneficiaries of TMP III. (Baseline: estimated based on information provided by each firm upon submission of the project). A 20% increase in billing for services to enterprises by beneficiary institutions of the reimbursable contributions to institutions component. (Baseline: estimated based on information provided for each project on the sales situation upon submission of the project). 	<p>FONTAR and FONCYT database.</p> <p>FONTAR and FONCYT database.</p> <p>FONTAR and FONCYT database.</p>	<p>Interest is maintained in promoting innovation in enterprises.</p> <p>Beneficiary firms see innovation as "good business."</p> <p>Local financial institutions incorporate financing to innovative companies into the services they provide.</p>
COMPONENTS			
1. Building technological innovation capacity in the productive sector.	<ul style="list-style-type: none"> 240 CAEs granted (I, II, and FT), of which 150 start within the program framework (Year 1: 81; Year 2: 49; Year 3: 43; Year 4: 37; Year 5: 30). 825 NRCs (PDTs; R&D units; Patents; Agencies) granted, of which 525 start within the program framework (Year 1: 296; Year 2: 238; Year 3: 134; Year 4: 107; Year 5: 50). Creation of 37 new R&D units in enterprises (Year 1: 7; Year 2: 10; Year 3: 12; Year 4: 8; Year 5: 0). 61 reimbursable contributions granted to institutions, of which 30 start within the program framework (Year 1: 23; Year 2: 12; Year 3: 10; Year 4: 9; Year 5: 7). 	<p>FONTAR database.</p> <p>FONTAR database.</p> <p>FONTAR database.</p> <p>FONTAR database.</p>	<p>Potentially interested enterprises and institutions are involved in a continuous process of modernization and technological innovation.</p> <p>The program's incentive framework is effectively implemented.</p>
2. Promoting alliance-building to resolve technological problems in productive clusters.	<ul style="list-style-type: none"> At least 10 integrated in productive cluster projects are financed (Year 1: 0; Year 2: 2; Year 3: 3; Year 4: 3; Year 5: 2). 	<p>FONTAR database.</p>	<p>The country's macroeconomic performance does not change significantly.</p>

NARRATIVE SUMMARY	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
SUBPROGRAM 2: Consolidation of R&D capacity			
OBJECTIVE			
<p>To build and expand the capacity to generate scientific and technological knowledge in thematic, priority, and strategic areas, stressing partnerships between the S&T sector and enterprises and public entities producing goods and services.</p>	<p>By the end of the program, with respect to the baseline:</p> <ol style="list-style-type: none"> 1. A 15% increase between the ratio of scientific productivity (publications per researcher) for researchers participating in projects financed by FONCYT with respect to a control group of researchers not financed by FONCYT. (2006 baseline: 100 for both groups). 2. A 20% increase in the share of financing for enterprises in PID projects compared to that reached in TMP II. (2005 baseline: 28 enterprises in PID projects; enterprises with financing/adopters with financing: 41.3%). 3. A 25% increase in the total number of R&D projects in strategic areas. (2005 baseline: 10 projects, 42 subprojects, 237 participating researchers, 11.9 million pesos). 4. A 30% increase in the number of researchers trained and in training in research groups in executing agencies benefiting from the program, in the priority areas defined in the Medium-term Strategic Plan. (Baseline: estimated based on information provided upon submission of the project). 5. A 20% increase in the share of regions with lower scientific and technological development with respect to more developed regions (in amounts allocated to R&D groups), with respect to the shares reached in the TMP II PICT and PICTO subcomponents. (December 2005 baseline: (i)-PICT: Pampas region (Buenos Aires + Center): 82.3% of projects and 84.8% of grants; Cuyo + NEA + NOA + Patagonia: 17.7% of projects and 15.2% of grants; (ii)-PICTO: Pampas region (Buenos Aires + Center): 86% of projects and 82.3% of grants; Cuyo + NEA + NOA + Patagonia: 14% of projects and 17.7% of grants. 	<p>Bibliometric analysis and econometric study.</p> <p>FONCyT database.</p> <p>FONCyT database.</p> <p>FONCyT database.</p> <p>FONCyT database.</p>	<p>Interest is maintained in strengthening and expanding the country's scientific and technological resources.</p> <p>The dynamic of increasing linkage between the local supply of scientific and technological knowledge and the productive sector's demand is maintained.</p>

NARRATIVE SUMMARY	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
COMPONENTS			
<p>1. Building and consolidating scientific and technological capacity.</p> <p>2. Expanding and building R&D human resources capacity in priority areas.</p>	<ul style="list-style-type: none"> - 150 PIDs are financed, of which 108 start within the program framework (Year 1: 40; Year 2: 30; Year 3: 30; Year 4: 30; Year 5: 20). - 2,750 PICTs are financed, of which 1,800 start within the program framework (Year 1: 850; Year 2: 550; Year 3: 550; Year 4: 550; Year 5: 250). - 500 are financed on PICTO calls, of which 360 start within the program framework (Year 1: 140; Year 2: 100; Year 3: 100; Year 4: 100; Year 5: 60). - 100 PME's are financed (Year 1: 0; Year 2: 50; Year 3: 25; Year 4: 13; Year 5: 12). - 15 PAE projects are financed (Year 1: 0; Year 2: 3; Year 3: 4; Year 4: 4; Year 5: 4). - 300 researchers are incorporated into projects at beneficiary institutions, within the framework of the financed PIDRIs (Year 1: 0; Year 2: 100; Year 3: 85; Year 4: 85; Year 5: 30). - 470 grant recipients are incorporated into projects at beneficiary institutions, within the framework of the financed PFDTs (Year 1: 0; Year 2: 160; Year 3: 130; Year 4: 130; Year 5: 50). 	<p>FONCyT database.</p> <p>FONCyT database.</p>	<p>The involved participants (outside the S&T sector) meet the commitments agreed upon.</p> <p>The program's incentive framework is effectively implemented.</p>
SUBPROGRAM 3: Institutional strengthening of science and technology organizations			
OBJECTIVE			
<p>To strengthen the institutional framework and national science and technology organizations.</p>	<p>By the end of the program:</p> <ol style="list-style-type: none"> 1. At least 11 science and technology organizations (STOs) are participating in the institutional strengthening process, including self-evaluation, external evaluation, and development of a strategic development and institutional enhancement strategy. 	<p>External evaluator reports.</p> <p>Reports by the National Department of Planning and Evaluation (DNPE SECyT).</p>	<p>Interest is maintained in strengthening and improving institutional programming/architecture of the S&T sector.</p> <p>Institutions adjust to the new institutional and incentive framework generated by reform of the S&T sector.</p>

NARRATIVE SUMMARY	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
COMPONENTS			
1. Institutional evaluation of science and technology organizations (STOs).	<ul style="list-style-type: none"> - 11 STOs present self-evaluations and sign letters of intent to submit to external evaluations (Year 1: 4; Year 2: 4; Year 3: 3; Year 4: 0; Year 5: 0). - 11 STOs evaluated by external experts and evaluation reports approved and validated by an Advisory Board for the Evaluation and Enhancement of STOs (Year 1: 4; Year 2: 4; Year 3: 3; Year 4: 0; Year 5: 0). 	<p>External evaluator reports and reports by DNPE-SECyT.</p> <p>Records of the Advisory Board for the Evaluation and Enhancement of STOs.</p>	<p>The institutions on which the involved STOs depend support the institutional enhancement process.</p>
2. Supporting the institutional consolidation of science and technology organizations.	<ul style="list-style-type: none"> - 9 STO management enhancement plans developed and validated by the Advisory Board (Year 1: 1; Year 2: 6; Year 3: 2; Year 4: 0; Year 5: 0). - 9 STO management enhancement plans with execution begun (Year 1: 1; Year 2: 3; Year 3: 7; Year 4: 9; Year 5: 9). 	<p>External evaluator reports, reports by DNPE-SECyT and records of the Advisory Board for the Evaluation and Enhancement of STOs.</p> <p>External evaluator reports and reports by DNPE-SECyT.</p>	<p>The involved participants respond appropriately to the proposed incentives.</p> <p>The program's incentive framework is effectively implemented.</p>
	<ul style="list-style-type: none"> - 90% of plans audited show successful outcomes, according to indicators proposed in the plans. 	<p>External performance measurement audits and evaluation and records of the Advisory Board for the Evaluation and Enhancement of STOs.</p>	

TMP III SUMMARY TABLE¹

Objectives		Instruments	Project types	Financing conditions	Max. financing TMP III	Component budget	Selection procedure
To promote technological development in the private sector	Technological modernization ²	CAE I	Technological modernization projects with high capital goods content.	Loans at market rate through IFIs that assume 100% of the credit risk	US\$1,000,000	US\$50,000,000 ³	Open window
		CAE II	Technological development projects involving capital goods and a higher proportion of intangible components.	Loans at market rate through IFIs Up to 50% of the loan may be syndicated by FONTAR	US\$1,000,000		Open window
		CAE FT	Technological development projects with higher potential risk.	Market rate loans. Financing through a trust fund financed pari passu (50%) by FONTAR and by third party funds	US\$1,000,000		Open window
	Technological innovation in small and medium-sized enterprises	NRC – PDT	Innovation projects	Nonreimbursable cofinancing (50% project cost)	US\$200,000	US\$76,640,000 ⁴	Periodic calls
		NRC – technological consulting	Technological consulting for groups of SMEs with common problems	Nonreimbursable cofinancing (50% project cost)	US\$75,000	US\$1,200,000	Periodic calls

¹ New instruments included in TMP III are shaded.

² In all three lending methods, FONTAR may grant an additional nonreimbursable contribution (NRC) of up to US\$200,000 (provided that it does not exceed 30% of the loan) to finance intangible components with a high technological risk.

³ Includes US\$12 million charged to CAEFIPP 2004.

⁴ Includes US\$10 million for complementary NRCs associated with CAE.

Objectives		Instruments	Project types	Financing conditions	Max. financing TMP III	Component budget	Selection procedure
		NRC – R&D laboratories in enterprises	Creation of R&D laboratories in enterprises	Nonreimbursable cofinancing (50% of researchers' wages for 4 years)	US\$200,000	US\$6,660,000	Periodic calls
		NRC – Patents	Financing of the patent application process to protect the intellectual property resulting from innovations arising in scientific and/or technological development projects	Financing up to 100% of the cost of filing patent applications	US\$75,000	US\$500,000	Open window
	Building capacity for providing technological services to the private sector	Reimbursable contributions to institutions	Projects to build technological capacity in nonprofit public and private institutions providing technological services to enterprises	Reimbursable financing (interest rate = IDB loan rate + admin. costs)	US\$2,000,000	US\$20,000,000	Open window
Consolidation of research and development capacity	Promoting scientific and technological research	PICT	Research projects in nonprofit public and private institutions.	Nonreimbursable grant for up to 50% of the project cost		US\$97,600,000	Competitive selection based on scientific merit through peer evaluation
			A Trained researchers		US\$30,000/year		
			B Young researchers		US\$9,000/year		
			C Research networks		US\$50,000/year		
		PICT-SU (Start-up projects)	Research projects in nonprofit public and private institutions to establish a foundation for training new technology-based enterprises	Nonreimbursable grant for up to 75% of the project cost	US\$50,000/year	US\$2,400,000	Competitive selection based on scientific merit through peer evaluation

Objectives		Instruments	Project types	Financing conditions	Max. financing TMP III	Component budget	Selection procedure
		PICTO	Research projects in nonprofit public and private institutions on themes defined by common agreement with a “cosponsoring” institution	Nonreimbursable cofinancing of projects shared with the “cosponsoring” institution	US\$35,000/year	US\$10,000,000	Competitive selection based on scientific merit through peer evaluation
	Promoting research targeting the resolution of problems with an identified demand	PID	Applied research projects – undertaken in nonprofit public or private institutions – whose results would be transferable to “adopter” enterprises or institutions that cofinance the project	Nonreimbursable cofinancing of the project shared in equal parts with the adopter enterprise or institution	US\$620,000	US\$10,000,000	Open window
	Development of human resources for scientific and technological research	PFDT	Institutional projects for doctoral training of a group of researchers according to programs in an institutional area of interest	Nonreimbursable cofinancing (70%) of training program costs	US\$1,000,000 (per beneficiary institution)	US\$28,000,000	Periodic calls for submission of institutional human resource development projects
		PIDRI	Researcher repatriation projects Institutional projects relocating researchers to create new research groups in geographic areas with less scientific development	Nonreimbursable cofinancing of relocation expenses + a PICT for each relocated researcher. Cofinancing (50%) of the wages of relocated researchers for 4 years.	US\$1,500,000 (per beneficiary institution)	US\$60,000,000	Periodic calls

Objectives		Instruments	Project types	Financing conditions	Max. financing TMP III	Component budget	Selection procedure
	Modernization of equipment for scientific research	PME	Modernization and equipment projects for the purchase, installation, development, adaptation, or construction of laboratory equipment and R&D centers in nonprofit public and private institutions	Nonreimbursable cofinancing of up to 66% of the cost of the equipment	US\$600,000	US\$27,000,000	Periodic calls
Promotion of alliance-building between the productive sector and S&T institutions	Technological and competitive development of local productive clusters	PI-TEC	Partnership projects submitted by a group of enterprises participating in a productive cluster [The project is made up of a set of subprojects based on FONTAR and FONCYT instruments]	The financing conditions will be those for the various FONTAR or FONCYT instruments for the subprojects making up the partnership project	US\$4,000,000	US\$40,000,000	Periodic calls for the submission of “project ideas.” The program will provide nonreimbursable financial assistance for the preparation of the final projects based on the project ideas preselected in each call
	“Precompetitive” technological development	PAE	Associated precompetitive research projects or projects resolving priority problems, for the strategic development of an field of knowledge or economic or social sectors identified in the multiyear S&T plans [The project is made up of a set of subprojects based on FONTAR and FONCYT instruments]	The program will also grant nonreimbursable financing for the coordination of the associative project.	US\$3,000,000	US\$25,000,000	

Objectives		Instruments	Project types	Financing conditions	Max. financing TMP III	Component budget	Selection procedure
Institutional consolidation of S&T institutions	External evaluation of science and technology organizations (STOs)		External evaluation of public science and technology organizations. TMP III will finance the fees, travel, and lodging expenses of a team of external evaluators	Nonreimbursable financing	US\$150,000	US\$1,500,000	STOs that have agreed with SECYT on the full institutional evaluation process and completed the self-evaluation stage will be eligible for this financing
	Institutional strengthening of science and technology organizations (STOs)		Projects to develop the institutional strengthening and enhancement plan based on the external evaluation process	Nonreimbursable financing	US\$400,000	US\$7,000,000	STOs that have completed their external evaluation process and submit a project in keeping with the evaluation's conclusions and recommendations will be eligible for this financing

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION

Argentina. _____ /OC-AR to the Argentine Republic
Technological Modernization Program III

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Argentine Republic, as Borrower, for the purpose of granting it a financing aimed at cooperating in the execution of a technological modernization program III. Such financing will be in the amount of up to US\$280,000,000, from the resources of the Single Currency Facility of the Bank's Ordinary Capital, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Executive Summary of the Loan Proposal.