

TECHNOLOGY DEVELOPMENT PROGRAM

(UR-0110)

EXECUTIVE SUMMARY

Borrower and guarantor:	The Oriental Republic of Uruguay	
Executing agency:	Ministerio de Educación y Cultura [Ministry of Education and Culture] (MEC)	
Amount and source:	IDB: (OC)	US\$30 million
	Local counterpart:	<u>US\$20 million</u>
	Total:	US\$50 million
Financial terms and conditions:	Amortization period:	20 years
	Commitment period:	4 years
	Disbursement period:	5 years
	Interest rate:	variable
	Inspection and supervision:	1%
	Credit fee:	0.75%
	Currency:	U.S. dollars, Single Currency Facility
Objectives:	<p>The general objective of the technology development program is to help mobilize the country's innovative capacity with the goals of boosting the competitiveness of small and medium-sized enterprises (SMEs) that produce goods and services and improving the conditions for science and technology development. Increased capacity for innovation will be achieved through the generation, use and adaptation of new technologies in production, management and distribution processes and through science and technology (S&T) activities.</p> <p>The program will finance: (i) projects to develop technology, services, and investments in training, information and management of technological resources, with a view to facilitating the creation and application of technology by individual companies and groups of companies that produce goods and services in Uruguay; (ii) enhancement of the country's capacity for complex research in a range of priority S&T disciplines and specialties; and (iii) strengthening of the national innovation system by coordinating S&T activities with the systematic treatment of innovation, promoting</p>	

regional and international linkages and acquainting the general public with advances in S&T.

Description: The program will consist of three subprograms: (a) support for innovation and competitiveness in Uruguayan companies (US\$25.7 million), which will help to boost their efficiency through innovations in production, management and distribution processes; (b) development and application of S&T (US\$12.2 million) to enhance the capacity to perform research and generate knowledge of use to society; and (c) institution building (US\$4 million), which will integrate activities in the different areas, through three components: (i) strengthening for the national innovation system; (ii) support for regional and international activities; and (iii) information and dissemination.

The Bank's country and sector strategy: The Bank's strategy in Uruguay is to promote investments as the motor for growth, attempting in particular to boost the capacity of the economy to make the most of the opportunities offered by MERCOSUR and other foreign markets. Three priority areas of action have been identified: (i) support for the deepening of structural reforms in the public sector; (ii) backing for initiatives to improve the climate for private investment, including a reduction in the Uruguay cost; and (iii) support for efforts to improve the coverage and quality of social services. The proposed program is linked to underpinning areas (i) and (ii) of this strategy.

Environmental and social review: The Committee on Environment and Social Impact (CESI) reviewed this operation and its recommendations on gender and environmental considerations are reflected in paragraphs 4.20, 4.21 and 4.22

Benefits: The program will help to boost Uruguay's capacity in science and technology, consolidating the progress made under an earlier Bank program. The proposed program has been designed to promote innovation and technology development in the productive sectors and enhance the quality and relevance of research projects. It will also contribute to the development of human resources specializing in S&T research and to linkage between research centers and the potential users of their results.

Risks: Building up the country's scientific and technological capacity is a necessary but insufficient condition for modern development. Demand and interest by producers must exist if that capacity is to bring the expected benefits. To that end, the proposed program will carry out a series of concurrent actions, such as cofinancing for joint projects, identification of areas of opportunity, advisory services for companies and support for technology management centers and business incubators to promote and facilitate linkage between

	companies, especially smaller ones, and sources of knowledge and scientific and technological information.
Special contractual clauses:	<p>Prior to the first disbursement of the loan, the borrower will present the following, to the Bank's satisfaction: (i) evidence that it has established and started up a program coordination unit, with the necessary funding and minimum staffing requirement for its operation in accordance with clause 4.01 of Annex A, and the necessary information, management, administrative, accounting, financial and internal control systems and operating manuals (paragraphs 3.3 and 3.4); (ii) evidence that selection committees have been established for company projects and S&T projects (paragraph 3.5); (iii) evidence that the program's Operating Regulations have been placed in effect (paragraph 3.7); (iv) model contracts to be signed by the borrower and the program beneficiaries (companies, business associations, grant recipients and technology institutions); (v) the operating plans for the components in the institution-building subprogram (paragraph 2.37); and (vi) the plan of operations for year one of the program (paragraph 3.12). Prior to the first disbursement for:</p> <ul style="list-style-type: none"> i. the institution-building subprogram, the borrower will present to the Bank's satisfaction, the preliminary terms of reference for the consulting services to be used for execution of this subprogram; ii. the S&T development and application subprogram, the borrower will present a list of areas of opportunity that have been approved.
Poverty-targeting and social sector classification:	This operation does not qualify as a social equity enhancing project, as described in the indicative targets mandated in the Eighth General Increase in Resources (document AB-1704).
Exceptions to Bank policy:	None.
Procurement:	Bank procedures will be followed for procurement of good and contracting consulting services. The program does not include civil works or new buildings. The projects to be financed may include small expansions or adaptations of existing buildings to allow for the installation of new equipment, which may not cost more than 25% of the total cost of the respective subproject, or US\$25,000. International competitive bidding will be required for procurements of goods costing the equivalent of US\$250,000 and over and for consulting services worth the equivalent of US\$200,000 and over. For individual consulting contracts costing less than the equivalent of US\$50,000 and contracts with consulting firms under the equivalent of US\$100,000, the Bank will perform an ex post review by random sampling.

I. FRAME OF REFERENCE

A. Macroeconomic context

- 1.1 Uruguay is undergoing an intensive structural adjustment process. At the same time as it is adapting to the timetable for integration with MERCOSUR, it is restructuring its productive sector to meet the challenges of the globalized market. The stabilization efforts of the structural adjustment process during 1995-1998 were based on an exchange anchor, reduction of the fiscal deficit and reform of the State.
- 1.2 The country has undertaken a series of reforms – many of them with Bank support – in areas related to budget management, tax collection, customs, social security, regulatory structures, and fiscal, monetary and exchange policy. At the start of the 1990s, it entrenched the process of deregulation and trade liberalization begun in the 1970s, when exchange and interest rate controls were lifted.
- 1.3 In recent years, Uruguay has been facing a difficult international context, particularly on account of the drastic fall in the prices of agricultural goods, which are the country's main export, and shrinking demand for goods and services in the MERCOSUR countries, mainly Argentina and Brazil. The situation worsened, particularly after the devaluation in Brazil in 1999, which Uruguay was able to cushion thanks to a prudent fiscal policy. That policy was reflected in the relative stability of the prices of Uruguayan bonds compared to the sharp drop in the bond prices of the other countries in the region. The unfavorable international context was worsened by high oil prices and interest rates. Given the situation, Uruguayans are convinced of the need to diversify their production and international markets, in a bid to lessen their heavy dependence on the region.
- 1.4 Real GDP shrank by 3.4% in 1999 and by about 1% in the first half of 2000; the unemployment rate climbed to almost 15% in Montevideo in June 2000, but inflation continued under control. Public finances deteriorated sharply. The fiscal deficit, which had been less than 1% of GDP in 1998, rose to 3.8% in 1999 and 4.5% in the year ending in June 2000. The deficit in the balance of payments current account rose by nearly 3% in 1999 and is expected to worsen this year.
- 1.5 The recent performance of Uruguay's economy has underlined the persistence of major challenges for medium-term economic and social development which must be tackled to achieve sustained growth in GDP in a context of macroeconomic stability, regional integration and globalization of markets. This last aspect points to the need to boost competitiveness to achieve strong growth in exports and spur productive investment, growth and job creation.
- 1.6 To face this challenge, public and private companies must first of all modernize their technologies, reduce their production costs and improve their returns; and second, the government must promote business development programs in the areas of management, productivity and marketing.

- 1.7 The 2000-2004 budget presented to the legislature on 31 August 2000, stresses the need to make exports more competitive as a mechanism for driving the country's development by continuing the process of economic modernization and investing in social areas and economic infrastructure. The prospective program is one of the projects in the investment program that will help improve the competitiveness of domestic production in the medium term.

B. The national innovation system

- 1.8 **General description.** As has happened in other countries in the region with higher relative development, in the second half of this century Uruguay went through a stage in which it built up basic capacities in science and technology. As a result, today it has a significant nucleus of researchers and institutions that specialize in different scientific disciplines, able to train young researchers. Despite the progress made, this potential is not fully tapped because existing capacity is not sufficiently linked to the demands and needs of the country's development.
- 1.9 A national innovation system (NIS) is defined by the OECD as a "network of public and private institutions whose activities and actions initiate, import, modify and disseminate new technologies". The constituent elements, the individuals, organizations and policies can be found in every country. The success of a NIS is measured by its capacity to promote constructive interactions among the different elements, in order to solve the problems of the absence of linkage between institutions that generate knowledge and the local productive apparatus, fragmentation and scattering of efforts, and frequent imbalances in access to resources.¹ Some of these functions, such as policy formulation, definition of the regulatory framework and the allocation of fiscal resources are carried out by national governments. Others, such as the financing and execution of innovative activities, the development of human resources and basic capacity and the provision of infrastructure, are shared by the public and private sectors.
- 1.10 In the case of the NIS in Uruguay, studies have concluded that all these functions are present to a greater or lesser extent, although they are general not generally interconnected and the linkage between research institutions and society is weak.^{2 3} Some aspects of the Uruguayan NIS are presented below, including a description of the functions of government agencies, an analysis of scientific potential, linkage between technology supply and demand, and the institutions that form part of the regulatory framework for innovative activities.

¹ Mullin J., 1998. "Technology Centers and the Needs of SMEs", presentation at the Round Table on the Dissemination, Assimilation and Use of Technology in Companies, held at the IDB.

² Saráchaga, D. *Ciencia y Tecnología en Uruguay: una Agenda hacia el Futuro*. Trilce, Montevideo, 1997.

³ Sutz, J. and Arocena, R. *La Innovación y las Políticas en CyT para el Uruguay*, CIESU-Trilce, Montevideo, 1998.

- 1.11 Progress in science and technology in recent years has helped to raise the level of higher education which, in turn, has had a positive influence on the qualifications of graduates entering the job market. The science and technology program (646/OC-UR and 647/OC-UR) financed by the IDB enhanced national capacity in different areas and disciplines, as reflected in the quality and size of infrastructure, in groups of more highly-qualified, committed researchers, in the increase in the number of reputable publications, in the introduction of post-graduate courses, and in a host of research and development projects.
- 1.12 **Government functions.** The Ministry of Education and Culture is responsible for designing policies, plans and programs and fostering activities in the fields of education, culture, science and technology and human development. It is also responsible for promoting development of the country's S&T potential and its application to national socioeconomic development. It has a small national S&T division which will become the National Directorate of Science, Technology and Innovation (DINACIT) if parliament passes the proposed budget for 2000-2004 submitted on 31 August 2000. The main functions of the National Science and Technical Research Council (CONICYT), which was established in 1961 as an autonomous institution under the Ministry of Education and Culture, include promotion of scientific and technological research in the country and the design of national S&T plans.
- 1.13 Regulation and funding of innovation is the responsibility of the executive branch, through the Ministry of Industry and Energy (intellectual property, standardization, metrology), the Ministry of Economic Affairs and Finance and the Planning and Budget Office (allocation of funds to different national entities, tax incentives, etc.).
- 1.14 Experience in industrialized countries has shown that a regulatory framework which promotes a climate that favors innovation is necessary to develop an effective NIS. The key elements in that framework include an effective system of legal protection for innovations and rules governing standards, weights and measures for domestic and imported manufactures. The Ministry of Industry, Energy and Mines' National Industrial Property Directorate is responsible for applying intellectual property legislation, while the Uruguayan Technical Laboratory (LATU) and the Uruguayan Technical Standards Institute (UNIT) apply the laws governing standards and metrology.
- 1.15 On 25 September 1998, Uruguay's legislature passed a new trademark act (Law 17011), which was ratified by Decree 34 of 4 February 1999. On 2 September 1999, the legislature passed a new patents, utility models and designs act (Law 17164), which was ratified by Decree 11 of 19 January 2000. The new trademarks and patents laws cover the main areas included in the most recent international treaties ratified by Uruguay. The trademark act is based on a proposal prepared by the World Intellectual Property Organization (WIPO), which provided advisory assistance financed by the Bank (loan 704/OC-UR). The copyright act, a draft of

which was also prepared with support from WIPO as part of the same loan, was sent to the legislature at the end of 1997, where it continues to be studied. It is expected to be passed in the near future.

- 1.16 **The potential of Uruguay's scientific community.** Uruguay forms part of the still small group of Latin American countries that have established a relatively important tradition of scientific research. Alongside Mexico, Brazil, Argentina, Chile and Venezuela, Uruguay is among the Latin American countries with the largest presence in internationally-recognized scientific publications. In recent years, Uruguay has stood out for its considerable and on-going efforts to develop high-level intellectual, academic and research capacity, with the result that its scientific publications grew six-fold between 1985 and 1998. The impact of its scientific publications, as reported by the Institute for Scientific Information which measures the number of citations by other researchers, grew by 100% over 1990-1998, with 70% of those citations appearing in research publications in the United States, Canada and Europe.⁴
- 1.17 It is also one of the few countries in the region that has developed some capacity of its own to train young researchers in its university and research institutes. However, there are gaps in terms of human resources trained in research, technology development and innovation that affect both the public and private sectors. As the NIS develops with the concomitant requirements for inter-agency coordination and closer linkage between R&D, markets and the productive sector, demand for skilled professionals will continue to grow. Currently, the country does not have enough of them and urgently needs to train more.
- 1.18 Furthermore, with the completion in early 2000 of the previous S&T program financed by the Bank, funding for R&D projects has been reduced, which discourages researchers and leads the best trained to emigrate.
- 1.19 **Supply and demand for scientific and technological knowledge.** Uruguay has a variety of S&T centers and institutes, such as the Clemente Estable Biological Research Institute (IIBCE), the different laboratories and institutes belonging to the Universidad de la República, the National Agricultural Research Institute (INIA), the Technology Laboratory of Uruguay (LATU), the National Fisheries Institute (INAPE) and the Uruguayan Wool Secretariat (SUL).⁵
- 1.20 Demand for technology by large private companies is mostly covered by foreign suppliers. However, small and medium-sized companies have demand for technical assistance that is not fully covered and which could largely be met by the capital of

⁴ Frank, C. "Indicadores Bibliométricos en C&T de Uruguay, comparación regional e internacional". Dpto. de Estudios y Políticas, CONICYT, 1998. Data updated to 2000.

⁵ Sutz, J., Lamschein, S. and Bortagaray, I. "Una aproximación primaria al Sistema Nacional de Innovación de Uruguay". Trilce, Montevideo, 1996.

technical knowledge that exists in the country, if technology extension mechanisms were suitably organized.

- 1.21 The competitiveness of the productive sector is limited by weak innovation capacity. Statistics on spending on innovative activities indicate that the sector contributes less than 40% to total spending on R&D in Uruguay. This situation is comparable to the rest of the Latin American countries but is far below the industrialized countries and the recently-industrialized countries in East Asia, where the sector contributes over half of spending on R&D. Experience shows that the transition to an innovative economy requires both an adequate and stable economic framework and incentives that encourage companies to invest in innovation.⁶
- 1.22 New types of cooperation between research institutes and companies are arising in Uruguay. The establishment of 'work panels' on barley, milling and wheat, forest products, textiles, citrus fruits, wine and rice are examples. Each panel is a virtual organization composed of the majority of companies in a given sector or complementary sectors (barley industry, forest products, software development, etc.) deliberately associated with research centers and institutes. Their main task is to link technology supply and demand by channeling private and public funds into R&D technology projects that focus on specific problems encountered by the companies as a whole.
- 1.23 Although a trend has been observed toward better linkage between university research units, technology institutes and private sector agents, this aspect needs to be strengthened further.

C. The situation of SMEs

- 1.24 When this project was being prepared, an analysis was performed of Uruguayan SMEs and the elements that restrict their development, in an operating context marked by a high degree of trade liberalization and growing competition. The information obtained from the competitiveness agendas prepared by the Ministry of Industry, Mines and Energy during 1999 points to the following weaknesses in Uruguayan SMEs: (i) in management and administrative and financial practices; (ii) in entrepreneurial training, since businessmen are not well enough prepared to plan company growth; (iii) in access to information and suitable processing of it; (iv) in access to credit since they cannot furnish guarantees; and (v) in misinformation regarding venture capital.

⁶ See M. Teubal, "Financiamiento de la Innovación en Economías en Vías de Industrialización: una Política Estructural", Round Table on the Dissemination, Assimilation and Use of Technology in Companies. IDB, February 1998.

- 1.25 Specific weaknesses were identified that affect the development of technology-based SMEs: (a) lack of long-term innovation strategies; (b) scant development of financial systems to support the incorporation of technological innovations; (c) priority given to instruments to support S&T supply rather than demand; (d) little applied research; (e) lack of R&D inside SMEs which therefore need linkage and synergy with universities, technology centers and technology services companies; and (f) underinvestment in technology as the basis for boosting competitiveness. The SMEs believe there is a mismatch between private and public supply and demand for instruments to support them. Firms and institutions that support S&T exist in independent spaces rather than complementary one. The presence of mechanisms to connect these two isolated spaces would be keys to improving linkage between companies and the institutional support system.
- 1.26 Strengths exist as well, including: (i) flexibility for reconversion and adaptability; (ii) highly trained technical staff and high public literacy rates; (iii) good communications infrastructure; (iv) sector experiences in innovation and transfers of successful technologies, as in the agricultural sector; (v) upgrading of industries in recent years, based on new technologies; and (vi) increase in exports by the services sector, particularly by software companies and medical emergency services companies.

D. Results of the first CONICYT-IDB program

- 1.27 A science and technology program (646/OC-UR and 647/OC-UR) costing US\$50 million, with Bank financing of US\$35 million, was carried out in the 1990s. Considerable progress was made under the operation, such as: 170 research projects in priority areas (energy, environment, water resources, food technology, information systems, microelectronics and basic areas); a credit program for companies that financed 25 innovation projects; grants to train 204 students (93 abroad and 111 in Uruguay) at the doctoral and masters levels in those areas, which has led to a significant rise in the number of qualified professionals working in R&D; construction and equipment for the new Faculty of Science in the Universidad de la República; strengthening of national laboratories; renovations and equipment for the Clemente Estable Biological Research Institute (IIBCE); and creation and support of the Technology Management Center (CEGETEC) in the orbit of the Industrial Board of Trade. The impact and performance of the first program, which has been completed, was evaluated by a group of experts contracted by the IDB's Evaluation and Oversight Office (OVE).⁷ The main results of that evaluation are described below.
- 1.28 **Research and development projects.** The evaluation noted that the 170 projects financed had good impact from the standpoints of scientific value, training for researchers and strengthening of the S&T infrastructure. Some of the research

⁷ See Inter-American Development Bank, Evaluation and Oversight Office, PPR 8/97.

projects had transferable and patentable results, but most of the projects initially designed for 'immediate transfer' had results that were mainly scientific in value. According to the evaluation, this was because the project was designed taking a 'linear' approach, whereby research is done first and then transferred. This comment coincides with the conclusions of the evaluations of other S&T programs performed recently by OVE and shows that the linkage between the generation of knowledge and demand for technology can only be promoted with tools that are specially designed for the purpose, for example, cofinancing of projects in which potential users participate actively from the outset.

- 1.29 **Innovation projects.** In 1993, a pilot program was carried out to finance innovative technologies through the Technology Research Fund (FINTEC), which supported 25 company projects. After most of them had ended, 15 were evaluated and their net present economic value was found to be highly positive.⁸ All of them led to increases in employment and sales.
- 1.30 **Human resource training.** To narrow the gap between training for Uruguayan researchers and training in other countries, which widened during the authoritarian government in the 1970s, 204 post-graduate scholarships were financed (45% for doctoral studies, 43% for masters' degrees and 12% for post-doctoral studies). Forty-seven short courses and 215 participations in scientific events and seminars were also financed.
- 1.31 **Program execution** was much slower than anticipated, owing to a number of factors, particularly: (i) an executing unit directed by a collegiate body that was basically deliberative, composed of 11 members who only worked part time on the program; (ii) shortcomings in organization, in the profiles of technical staff and in the procedures followed; and (iii) relatively slow execution of research projects by the beneficiary institutions.

E. Lessons learned and best practices

- 1.32 The project completion report stresses the science and technology program's major contribution to strengthening the country's S&T capacity, which has created favorable conditions for a second program that will consolidate the progress made thus far and help to spur the innovation process.
- 1.33 The main lessons learned from the first program can be gathered from the following recommendations contained in the report: (i) focus efforts on spurring the innovation process, without neglecting maintenance of the existing scientific infrastructure; (ii) establish bodies and mechanisms to coordinate the different stakeholders in a balanced fashion; (iii) assure program leadership; (iv) pay special

⁸ Evaluación Económica de los Proyectos financiados por el Programa CONICYT-BID. Ernesto González Posse.

attention to technical profiles and selection criteria for the main management positions; (v) prepare and analyze the program's logical framework in conjunction with the parties involved; (vi) require an operating design for all components, particularly the institution-building component; (vii) require the presentation of annual operating plans, with agreed contents; (viii) include mid-term evaluations by external consultants.

- 1.34 The recommendations regarding execution mechanisms stress: (i) allocate sufficient funds to prepare program management mechanisms (operating regulations) (criteria and procedures for selecting areas of opportunity and projects, project evaluation methods, information systems for technical, administrative, accounting and financial follow-up and evaluation, minimum requisites for the professional profiles of the members of the executing unit, use of financial resources to attract technical management staff that would not be tempted by public sector salaries); and (ii) support the executing unit in mounting those mechanisms prior to the first disbursement.
- 1.35 The evaluations performed by OVE note that S&T programs have played an important role in developing the science and technology capacity of borrowing member countries. To improve the impact and effectiveness of future operations, the report recommends that they be designed after analyzing the NIS, include support for the dissemination and assimilation of technology, pay closer attention to the relationship between technology supply and demand, and be based on broad consensus with the stakeholders involved. To improve execution, the report notes the need to pay special attention to the institutional capacity of the executing agencies and to active follow-up by the Bank, including periodic performance reviews.
- 1.36 S&T programs in the OECD countries indicate that the use of nonreimbursable cofinancing for innovation and development in enterprises is very frequent.⁹ This method of cofinancing has been used successfully in the Technology Development Fund (FONTEC) in Chile (627/OC-CH) and in Stage III of the Science and Technology Program in Colombia (875/OC-CO).¹⁰ For its part, the Bank's new science and technology strategy (GN-1931-3) also recommends that this operating method be included in future S&T programs to explicitly promote closer ties between research centers and potential users of research results in the production apparatus and other sectors of society.

⁹ "Small and Medium-Sized Enterprises. Technology and Competitiveness". Organization for Economic Cooperation and Development, 1993.

¹⁰ Also see Teubal, M., "Alternativas de políticas para financiar el desarrollo tecnológico de las empresas" presented at the Round Table on the Dissemination, Assimilation and Use of Technology in Companies, IDB, 1998; and Waissbluth, M., "El Financiamiento Gubernamental a la Innovación, *Comercio Exterior*, Vol. 84, No. 7, Mexico, 1998.

- 1.37 Last, building S&T capacity is a long-term process that requires sustained support. This support is particularly important during economic crises, when the lack of funding can lead to the break-up of research groups, with the consequent loss of valuable human resources it would be difficult to recuperate.

F. The Bank's country strategy

- 1.38 Based on the country's macroeconomic situation in 1999 and so far this year and the government's economic and social policy guidelines for the future, the Bank's priority areas of action will focus on:
- a. Support for initiatives that boost the competitiveness of domestic production on regional and international markets and promote private investment for sustained production based on comparative advantages and the incorporation of modern technology, with a view to laying the groundwork for healthy competition that will win the country a better position on those markets.
 - b. Support for the entrenchment of transformation and modernization of the State and better governance to reduce its weight on the economy, increase its efficiency, rationalize and focus its interventions, and reduce its impact on the domestic production of goods and services.
 - c. Support for efforts to enhance social well-being and equity by including the most vulnerable groups in the development process and improving the quality of life.
- 1.39 The proposed program is consistent with the Bank's strategy since it will support the government's interest in consolidating and deepening technology development, with stress on boosting the efficiency of Uruguayan SMEs. It will also: (i) support the expansion of S&T programs and funding through the inclusion of private sources; (ii) promote the installation of infrastructure such as incubators for technology-based businesses, technology development centers and advisory services to promote the use of information technology, including e-commerce, the Internet and communications; and (iii) contribute to modernization of the State through the institution-building subprogram for public S&T agencies.

G. Design of the new program

- 1.40 The proposed program will support capacity for innovation, assimilation and use of new technologies in the productive sectors, promote efficient management and financing of S&T activities, strengthen linkages between centers that generate knowledge and potential users, and promote research on the main social and environmental problems in the country.
- 1.41 The new program has been prepared taking account of the lessons learned from the previous program, the conclusions and recommendations contained in various studies performed by consultants, the analysis of the NIS, consultations with the

private sector and the academic community, the recommendations contained OVE and EDE reports and the Bank's new S&T strategy.

- 1.42 The proposed program is particularly important in the difficult situation currently affecting the country, since it will assure that the S&T capacity Uruguay has been building over several decades will be maintained and steered toward innovation. Continued support for S&T by successive governments is a sign of the priority that the country attaches to efforts to continue strengthening the capacity to generate scientific knowledge and promote innovation in the productive, social and environmental sectors, with a view to fostering growth and greater diversification of the economy.

II. THE PROGRAM

A. Objective

- 2.1 The general objective of the technology development program is to help mobilize the country's innovation potential to make production more competitive, particularly in small and medium-sized enterprises (SMEs) that produce goods and services, and to boost the capacity for developing science and technology.
- 2.2 Increased capacity for innovation will be achieved through the generation, use and adaptation of new technologies in products, production, management and distribution processes and through S&T activities. The program will also promote efficient management and financing of S&T, strengthen the linkage between centers that generate knowledge and potential users, promote research on the country's main social and environmental problems, and encourage greater participation by the private sector in S&T.

B. Description

- 2.3 The program will finance: (i) projects to develop technology, services and intangible investments such as the cost of training, information and management to facilitate the generation and application of technology in processes that produce goods and services in Uruguay, on the sector level and in individual companies; (ii) maintenance and strengthening of the country's capacity for high-quality research in a range of priority S&T disciplines and specialties; and (iii) strengthening for the national innovation system by coordinating S&T activities for the systematic treatment of innovation, promoting regional and international linkages and disseminating advances in S&T to the entire community.
- 2.4 The program will consist of three subprograms: (a) support for innovation and better competitiveness of companies; (b) development and application of S&T; and (c) institution building. The activities to be financed, their components and scales are described below. Program activities will be executed in accordance with the operating regulations (technical files No. 13) and planning is based on the logical framework (Annex II-1).

1. Subprogram to support innovation and boost the competitiveness of companies (US\$25.7 million)

- 2.5 This subprogram will boost the competitiveness of Uruguayan companies by helping them to introduce innovations in products and in production, management

and distribution processes. The stress on SMEs¹¹ is explained by the greater difficulties they face in modernization and innovation.

- 2.6 In response to the needs of SMEs detected in two surveys,¹² this subprogram will include the following mechanisms for innovative technological activities: (a) direct support for individual companies; (b) support for joint projects by companies; (c) employment of experts by companies; and (d) promotion of technology management and transfer units and business incubators.
- 2.7 **Direct support for individual companies.** This component will build up the technological capacity of companies by providing nonreimbursable cofinancing for innovative projects that will boost their competitiveness, productivity and earnings by researching and developing new products and/or processes in response to market needs and opportunities. It will also support projects to improve existing products and/or processes, including the adoption of cleaner technologies.
- 2.8 An innovation will be deemed to exist if it has been placed on the market. Innovations, therefore, include a series of technological, scientific, organizational, financial and commercial activities. Projects can be executed by a company with its own personnel, in association with research institutions, or by subcontracting services with specialized firms or consultants.
- 2.9 To estimate the demand for financing, CONICYT and the Industrial Board of Trade surveyed 300 Uruguayan companies. The survey identified more than 30 potential projects costing over US\$4 million that could participate in year one of the program.
- 2.10 **Support for joint projects by companies.** This component will promote national competitiveness by cofinancing projects by associations of companies in a sector, production chain or complex, to identify and solve common technological problems in products or processes.
- 2.11 Institutions, including 'panels',¹³ clusters,¹⁴ and business associations, who will answer to the executing agency for project execution, may apply for this type of cofinancing. The projects must have the explicit backing of at least three

¹¹ MERCOSUR criteria will be used to define SMEs. Industrial SMEs have fewer than 300 employees and annual sales of up to US\$20 million. SMEs in commerce and services have fewer than 80 employees and up to US\$8 million in annual sales.

¹² Survey on demand for technology conducted by the Uruguayan Industrial Board of Trade, CONICYT and LATU, 1998; and Survey on demand for S&T in the Uruguayan industrial sector conducted by Rosario Domingo and Rubén Tansisi, December 1997.

¹³ See paragraph 1.17.

¹⁴ Clusters are groups of companies that are closely interrelated and highly complementary in their activities.

independent companies that express a joint interest in executing and cofinancing the project.

- 2.12 In 1999, when this program was being prepared, joint projects were promoted and a call for submissions at the end of October resulted in the presentation of 28 projects totaling more than US\$14.5 million. The projects cover a wide range of sectors, including agroindustry, construction materials, software, energy and chemicals.
- 2.13 The **individual and joint projects (US\$23.3 million)** to be financed under the program can include aspects to bolster the technological capacity of companies by establishing nucleuses, units or research centers for technology innovation and developing the infrastructure needed for innovation and quality improvement. Support will also be provided for better management techniques, the introduction of management systems, minimization of losses and the use of cleaner technologies, technical standardization, introduction of quality systems, certification of systems and products, development of information services and technologies, and the development and/or use of computer communications networks to support innovative processes.
- 2.14 The **individual and joint projects** will be cofinanced by proposed program and the beneficiary companies. The executing agency will grant nonreimbursable financing for up to 50% of the cost of a project, with the following ceilings: (i) up to US\$250,000 for technology projects and up to US\$20,000 for management and quality projects in the case of individual projects and (ii) up to US\$800,000 for technology projects and up to US\$100,000 for management and quality projects in the case of joint projects. For the latter type of projects, the companies and participating institutions must sign an agreement and appoint a person to coordinate activities and present technical and accounting reports.
- 2.15 For **individual and joint projects**, the program will not finance investments in capital goods for production on an industrial scale, civil works costing more than 25% of the project or US\$25,000 (whichever is less), or purchases of land or vehicles. The subprogram will not grant loans to private companies, since Uruguay has a medium- and long-term multisector credit facility to finance private investment projects of all kinds, including technology development projects (1155/OC-UR). However, it will seek to facilitate interaction between participating companies and the financial sector. The PCU will have a technical expert on staff with experience in loan analysis, who will review the financial situation of companies, when necessary, examining their weak points so they can address them and gain access to credit.
- 2.16 Applications for financing for **individual and joint projects** will be evaluated by the selection committee for company projects (see paragraph 3.5) on the basis of their innovative merit, technical, environmental, financial and socioeconomic

feasibility, company capacity to execute the project and its business or technology development plan.

- 2.17 **Employment of experts by companies (US\$1 million).** This component will provide support, on an experimental basis, for SMEs in hiring professionals with high academic levels to introduce technical criteria for solving technology problems in production and management.¹⁵ The program will provide nonreimbursable cofinancing for up to 50% of the salaries of researchers for up to two years, up to a maximum of US\$10,000 a year. Activities in this component will make efficient use of trained human resources to the benefit of production development, facilitating the incorporation of technologies and young researchers.
- 2.18 **Promotion of technology management centers, business incubators, and technology councils (US\$1.5 million).**¹⁶ This component will promote the creation of new technology-based companies and support technological modernization of SMEs through financing for business incubators, technology management centers and technological advisory services. The program will provide nonreimbursable cofinancing for up to 50% of the costs of operating the incubators. Proposals may be presented by boards of trade, universities, cooperatives and nonprofit institutions. Support will also be provided for private technology management centers sponsored by business groups or boards of trade in a given sector. The centers will provide technological support for companies in one or more branches of production, with particular emphasis on the needs of SMEs. The program will provide nonreimbursable financing up to 50% of the total cost of a project to be carried out by a center. In both types of projects, the ceiling on cofinancing will be US\$300,000.
- 2.19 **Technology advisory services.** The purpose is to facilitate the contracting of experts by groups of companies to diagnose their technological situation and problems in areas such as process management, production organization and training, as the basis for designing and eventually implementing projects for innovation, technological modernization and the introduction of technology- and quality-management systems. The program will provide nonreimbursable cofinancing up to 50% of each request for advisory services, up to a maximum of US\$20,000.
- 2.20 In all cases, the projects to be financed will be selected on a competitive basis from among the proposals presented in response to specific competitions. The organization and management capacity of the center or incubator and its business

¹⁵ This type of project is being used successfully in Argentina (researchers in companies) and Brazil (doctors in companies).

¹⁶ Business incubators are instruments to foster the establishment and initial development of new technology-based companies. The specific objectives for each new company are consolidation of the management team, obtaining the capital needed for their development, and introducing new products on the market.

plan to ensure the sustainability of the project will be considered when evaluating the proposals. Program financing for projects will last for a maximum of three years.

- 2.21 The main indicators of the results of this subprogram will be the quality certifications obtained by companies, the introduction of new products, manufacture of more competitive products, improvements in business management, employment of experts by companies, creation and strengthening of technology management centers and business incubators, and the technical advisory projects carried out (see the logical framework, technical files 14, for more details).

2. Subprogram for S&T development and application (US\$12.2 million)

- 2.22 This subprogram will expand capacity to generate scientific and technological knowledge in 'areas of opportunity'.¹⁷ The beneficiaries will be public and private nonprofit research and development centers and activities will be organized into the following components: (a) linkage between supply and demand for technological knowledge; (b) promotion of basic research; (c) training; (d) exchanges of researchers; and (e) strengthening of S&T services.
- 2.23 In view of the good experience of the earlier program, this component will allocate resources through competitive funds. Periodic invitations for applications will be issued and eligible projects will be selected through peer evaluation performed by recognized Uruguayan and foreign specialists. The evaluation criteria will include the experience of the applicants, the quality of the proposals and the pertinence and expected impacts of the projects. The rules for the competitions and selection criteria will be contained in the announcements to ensure the transparency of the process.
- 2.24 The final selection of the projects to be financed will be made by the S&T project selection committee (see paragraph 3.5). The funds awarded to each project will be administered by the beneficiaries based on a budget and timetable approved under domestic legislation and the rules for the procurement of goods and services stipulated in the loan contract.
- 2.25 **Linkage between supply and demand for technological knowledge in areas of opportunity (US\$7.5 million).** This component is intended to solve specific technology problems in areas of opportunity. Maximum nonreimbursable financing for each research project in this category will be US\$250,000.
- 2.26 A start has been made on defining areas of opportunity by canvassing the opinions of a representative group of senior officials from public and private institutions and

¹⁷ Areas of opportunity promote the solution of preidentified problems of social and economic interest. These may be reviewed periodically in consultation with the Bank based on developments in science and technology and in the country's socioeconomic context.

researchers (government ministers, deans of public and private universities, presidents of autonomous agencies, business associations etc.). The areas identified in the survey will be subject to technical and socioeconomic analysis to detect strengths and weaknesses in each and identify problems to be investigated.

- 2.27 When an area of opportunity is selected, an area committee will be established to identify and select priority topics and problems that could be included in the competitions for projects. The committee areas will consult different agencies, institutions, companies and research groups. The process will be convalidated by CONICYT.
- 2.28 Uruguay has experience in steering research into priority areas identified by the 'work panels' mentioned earlier, where agreements are reached among the stakeholders. The first was the barley panel, which has been operating successfully since 1992, solving key problems that affected the sector's development and competitiveness.
- 2.29 **Promotion of basic research (US\$1.5 million).** This component will help to strengthen national scientific capacity through nonreimbursable financing for basic research projects. The program will support areas such mathematics, information science, chemistry, biology, earth sciences, electronics, telecommunications, meteorology and environmental science. The projects will be conducted in universities and nonprofit public and private research institutes and centers. Periodic competitions will be held and proposals will be evaluated by Uruguayan and foreign specialists on the basis of the quality of the proposals, the background of the researchers and project pertinence. The maximum per project will be US\$50,000.
- 2.30 **Training in areas of opportunity (US\$1.6 million).** The project will support training for researchers in technological or applied specialties that require strengthening. The disciplines or specialties to be supported will be based on the areas of opportunity that have been defined, which will be reviewed periodically.
- 2.31 Support will take the form of grant-loans, under competitive procedures that were successfully used in the earlier program, for post-graduate studies abroad (masters', doctoral and post-doctoral). Sandwich grants will be used, which require part of the thesis work and other activities to be undertaken in the country and part abroad. This will facilitate the return of researchers trained under the program and encourage them to focus on problems of interest to the country.
- 2.32 **Exchanges of researchers (US\$500,000).** The program will contribute to the training of researchers in disciplines and specialties related to the areas of opportunity, by financing internships for post-graduates abroad and inviting visiting researchers, selected on a competitive basis, to work in Uruguay. For the visiting researchers, applications must show that they will have the facilities required for

their work and that there will be a minimum group of counterparts willing to work on the projects described in the proposals. Internships abroad should be in fields supported by the home institutions.

- 2.33 **Strengthen of S&T services (US\$1 million).** This component will boost the supply of S&T services through financing for major equipment and software not available in the country for institutions that can guarantee its will be properly operated and maintained and used to provide services for at least three research groups.
- 2.34 Selection criteria will give priority to projects that provide services for the productive sector and for as many researchers in the country as possible. Up to 80% of a project can be cofinanced, with a floor of US\$50,000 and a ceiling of US\$500,000.
- 2.35 Proposals should include operating regulations that will guarantee broad access to the equipment to be procured and a business plan demonstrating that the institution can operate it in a sustainable manner.
- 2.36 The main indicators of the results of this subprogram will be projects to link technology supply and demand approved and carried out in areas of opportunity, basic research projects approved and carried out, human resources trained on the post-graduate level in Uruguay and abroad, exchanges of researchers, and major software equipment procured, installed and in operation (for more details see the logical framework, technical file 14).

3. Subprogram for institutional strengthening (US\$4 million)

- 2.37 This subprogram will include: (a) activities to strengthen different science and technology institutions, particularly those in the Ministry of Education and CONICYT in their function of designing policies for science, technology and innovation; (b) support for participation by the government and the institutions in the NIS in international cooperation and exchange programs, particularly with the members of MERCOSUR; (c) promotion and dissemination activities to promote social appreciation of science, technology and innovation and encourage children and young people to study science and technology.¹⁸ Presentation of the operating plan for the three components in this subprogram and the terms of reference for the consulting services and training activities will be conditions precedent to the first disbursement of the loan and the first disbursement for subprogram III, respectively.
- 2.38 **Strengthening of S&T institutions and the science, technology and innovation policy area (US\$2 million).** This component will include funds to train staff and

¹⁸ May include the creation of an S&T museum that the government is planning for Montevideo.

contract consulting services for policy design, budget management and execution, and evaluation and follow-up of projects in the different institutions in the system. National and international experts will be contracted to create and support a structure for designing S&T policies and funding will be made available to train permanent staff.

- 2.39 To help develop the functions for which the future National Directorate of Science, Technology and Innovation (DINACIT) will be responsible, actions are proposed to strengthen information systems, prepare indicators and produce new databases, program and evaluate activities in the S&T system and publicize the sector's activities and results more widely.
- 2.40 **International cooperation activities (US\$1 million).** This component will help to create more opportunities for international cooperation in science and technology by designing an operating strategy for the area and supporting the development of databases and management mechanisms to: (i) detect opportunities for cooperation and link them to existing demand for cooperation in an effective and transparent fashion; and (ii) follow up on the progress made in this field and evaluate the results.
- 2.41 **Information and dissemination (US\$1 million).** This component will finance projects intended to promote and publicize the different types of activities related to science, technology and innovation carried out by the executing agency itself and by other institutions in the NIS.

C. Program scale

- 2.42 Table II-1 shows the scale of the program, broken down into the actions to be financed under each component. The contributions made by companies will be used for individual or associative projects accounting for at least 50% of the project value. These amounts will come to more than US\$10 million. The companies will also contribute at least 50% of the experts' fees and of the financing for incubator companies, technology management centers, and technology advisory services, where the contribution will exceed US\$1 million.

TABLE II-1
Total Costs
(US\$ equivalent in thousands)

ITEM	IDB (OC)	LOCAL CONTRIBUTION		TOTAL	% TOTAL
		Govt.	Company		
1. ADMINISTRATION	2,000	1,000		3,000	6.0
2. DIRECT COSTS	24,400	7,500	10,000	41,900	83.8
2.1 Subprogram to support innovation and competitiveness in companies	15,750		10,000	25,750	51.5
a. Direct support for individual and joint company projects	14,250		9,000	23,250	46.5
b. Employment of experts by companies	500		500	1,000	2.0
c. Technology management centers and business incubators	1,000		500	1,500	3.0
2.2 Subprogram for S&T development and application	6,650	5,500		12,150	24.3
a. Linkage between technology supply and demand	4,500	3,000		7,500	15.0
b. Promotion of basic research		1,500		1,500	3.0
c. Training in critical areas	1,150	500		1,650	3.3
d. Exchanges of researchers		500		500	1.0
e. Strengthening of S&T services	1,000			1,000	2.0
2.3 Subprogram for institutional strengthening	2,000	2,000		4,000	8.0
a. Strengthening institutions and the policy area of science, technology and innovation	1,000	1,000		2,000	4.0
b. Support for regional and international activities	500	500		1,000	2.0
c. Information and dissemination	500	500		1,000	2.0
3. FINANCIAL COSTS	3,000	1,000		4,000	8.0
3.1 Interest	2,700	775		3,475	6.9
3.2 Credit fee		225		225	0.4
3.3 I&S	300			300	0.6
4. UNALLOCATED	600	500		1,100	2.2
4.1 Contingencies	600	500		1,100	2.2
TOTAL	30,000	10,000	10,000	50,000	100.0
% TOTAL	60.0	20.0	20.0	100.0	

III. INSTITUTIONAL FRAMEWORK AND PROGRAM EXECUTION

A. Institutional framework

- 3.1 The borrower will be the Oriental Republic of Uruguay and the executing agency will be the Ministry of Education and Culture (MEC). The ministry was established in 1883 and has undergone a number of reorganizations, the last being on 10 March 1998.
- 3.2 The functions assigned under the most recent reorganization include promotion of the country's S&T potential and its application to socioeconomic development, with stress on linkage with the productive sector. To carry out that function the ministry has proposed to the legislature that a National Directorate of Science, Technology and Innovation (DINACIT) be created, which would have a broader mandate than the ministry's Science and Technology Division, which would cease to exist.

B. Program execution plan¹⁹

- 3.3 To ensure efficient execution of the program, the MEC will establish a program coordination unit (PCU) that will report directly to the minister and be responsible for all aspects of cooperation and administration. The unit will be the direct contact between the ministry and the Bank and third parties and will act in close coordination with the future DINACIT. It will be organized into three line areas responsible for management of company projects, management of S&T projects, and program administration and finances, respectively.
- 3.4 The PCU will have qualified staff distributed among the three line areas and personnel to advise the coordinator, including an assistant coordinator, an auditor and a chief of management and control. It will also have a specialist in credit analysis who will act as liaison with lending institutions. The coordinator of the PCU has already been selected through the services of a private-sector management recruiting expert. The PCU's staff²⁰ may come from the ministry or be contracted, if necessary. The costs and salaries²¹ of contracted staff may be recognized as program costs. Technical file 17 describes the functions, personnel, estimated costs and other details regarding the PCU. The creation and start up of the PCU,

¹⁹ The program execution plan is based on an in-depth analysis performed when this operation was being prepared, with the cooperation of international experts.

²⁰ The PCU management positions will be filled through a competitive bidding process, headed by a court that guarantees participants professionalism and transparency in accordance with Annex C to the loan contract. During the process, consideration will be given to experience with S&T programs in the public and private sectors.

²¹ The productivity incentives plan for compensation will be agreed on with the Bank.

including appointment of the minimum complement of staff needed to operate the Unit in accordance with clause 4.01 of Annex A, and implementation of its management information, administrative, accounting, financial and internal control systems and operating manuals will be a condition precedent to the first disbursement of the Bank loan.

- 3.5 The following procedure will be used to ensure transparency in the allocation of funds, particularly to individual and joint company projects. Public competitions will be announced for the presentation of projects to be financed under subprograms I and II. The projects will be evaluated by the PCU and sent together with their technical acceptance to the selection committees which will bear final responsibility for accepting or rejecting them. In subprogram I, support for company innovation and competitiveness, there will be a seven-member selection committee composed of two representatives from business associations, one from the Universidad de la República and four from the executive branch (MEC, Ministry of Economic Affairs and Finance, Ministry of Industry, Energy and Mines and Ministry of Livestock, Agriculture and Fisheries). In subprogram II, science and technology development, there will also be a seven-member selection committee with two representatives from the Universidad de la República, one from the private universities, one from business associations and three from the executive branch (MEC, Ministry of Industry, Energy and Mines and Ministry of Livestock, Agriculture and Fisheries). The establishment of these two committees will be a condition precedent to the first disbursement of the Bank loan.
- 3.6 DINACIT will select or reject the institution-building projects in subprogram III or, until such time as it is created, that task will be performed by the selection committee for S&T projects.
- 3.7 **Operating regulations.** The program will be governed by the operating regulations agreed to by the executing agency and the Bank. The regulations have four sections: (a) general rules; (b) guidelines for the subprogram to finance company projects; (c) rules for the subprogram for S&T projects and activities; and (d) rules governing the activities to be financed under the institution-building subprogram. The four sections contain guidelines, criteria, procedures and provisions governing the use of program funds. The MEC must place the regulations in effect as a condition precedent to the first disbursement of the prospective Bank loan.
- 3.8 The conditions for financing projects to support company innovation and competitiveness were summarized in Chapter II. The company projects will be chosen through competitions or an open window and will be evaluated by the PCU in consultation with the pertinent selection committee. The items eligible for financing will be contracts for consultants and training services for company personnel, short courses abroad (under two months), technical staff for project execution, materials and inputs, light equipment, test equipment, laboratory tests,

environmental protection and workplace safety installations and/or safety measures, bibliographical materials, software, technical and maintenance services associated with projects, intellectual property protection costs, cost of licenses and specific adaptations of buildings to house equipment.

- 3.9 The following criteria will be used to evaluate innovation projects: (i) innovative merit (type and degree of innovation); (ii) technical feasibility; (iii) availability of funding for the project; (iv) evaluation of the company's financial status; (v) preliminary plan (business plan, including economic, financial, marketing, sales, and distribution aspects, etc.); and (vi) company execution capacity. The following criteria will be used to evaluate management and quality projects: (i) impact on the company; (ii) technical feasibility; (iii) financial feasibility; (iv) economic feasibility; (v) match with the company's problems; and (vi) technical capacity of the proposed consultants.
- 3.10 The beneficiaries of the projects for S&T development and application, which will be selected on a competitive basis, will be legally-established nonprofit public and private agencies, whose main purpose is to advance and/or apply knowledge in different S&T areas. The financing conditions are summarized in Chapter II.
- 3.11 **Annual operating plans.** The executing agency will present the annual operating plan prepared by the PCU for the following year to the Bank for consideration prior to November 31 each year. It will include programming of the activities and tasks to be performed under each of the components of the different subprograms; the monthly execution timetable and the timetable for disbursement of Bank funds and the local contribution; the quarterly disbursements to be requested from the Bank; the results to be achieved for each component and progress toward the goals of the subprograms and the program as a whole. It will also include a comparison of each of these aspects with the targets established in the logical framework and the financing program included in this proposal. Presentation of the plan for year one will be a condition precedent to the first disbursement of the prospective loan.
- 3.12 **Financial administration of funds.** The counterpart funds from the National Treasury Department will be managed in an operating account opened in the program's name in the Banco de la República Oriental del Uruguay. The funds from the Bank loan will be managed in a special account in the Banco Central de Uruguay. Through the PCU, the executing agency will be responsible for keeping separate accounting and financial records on the administration of program funds that make it possible to identify financial transactions and prepare financial statements for the program.

C. Contracting of works and procurement of goods and services

- 3.13 Bank procedures will be followed in contracting consulting services and procuring goods. No civil works or new buildings are envisaged. The subprograms to be

financed under the program may include small construction works needed to house equipment, which may not cost more than 25% of the total cost of the project or US\$25,000, whichever is less. International competitive bidding will be required for procurements of goods costing US\$250,000 and over and for services US\$200,000 and over. For contracts for individual consultants costing less than US\$50,000 equivalent and contracts with consulting firms under US\$100,000 equivalent, the Bank will perform an ex post review of a sample of the contracts.

D. Execution period, disbursement schedule and revolving fund

- 3.14 An execution period of five years has been determined based on the analysis. The tentative disbursement schedule presented in Table III-1 is based on estimates made during program preparation. It is recommended that a revolving fund of 5% of the loan be established to cover cash requirements in each year of execution. The tentative procurement schedule is presented in Annex III-1.

TABLE III-1
Annual Program Disbursements by Source
(US\$ thousands)

YEAR	I	II	III	IV	V	TOTAL	%
IDB	2,000	3,500	6,500	9,000	9,000	30,000	60.0
GOVERNMENT	500	1,000	2,500	3,000	3,000	10,000	20.0
OTHER ^{1/}	1,000	2,000	2,000	2,500	2,500	10,000	20.0
TOTAL	3,500	6,500	11,000	14,500	14,500	50,000	100.0
% per year	7.0	13.0	22.0	29.0	29.0	100.0	

^{1/} Companies

E. Bank monitoring and supervision during the program

- 3.15 **Meeting to launch the program.** Within three months after the loan contract becomes effective, the executing agency and the Bank will hold a seminar-workshop to launch the program. The event will be attended by the national team, the Bank and the other program participants. The Bank will permanently monitor program execution through the Country Office in Uruguay.
- 3.16 To that end, the Bank and the executing agency have agreed on benchmarks, which are shown in the logical framework for this operation. Follow-up actions have also been included which will permit the executing agency and the Bank to verify compliance with the goals and make any necessary adjustments. The actions include an external evaluation of the program, contracted by the executing agency, to be performed 24 months after the loan contract becomes effective or when 25% of program funds have been disbursed, whichever comes first.
- 3.17 Within 60 days after the end of each semester, the executing agency will prepare semiannual progress reports and send them to the Bank. Within 60 days after the

reports for December 31 of each year are received, meetings will be held with the Bank to analyze progress.

F. External auditing

- 3.18 During the program, the executing agency will present the program's financial statements, duly examined by an independent firm of auditors acceptable to the Bank, which will be financed with loan proceeds. The statements are to be presented within 120 after the close of each of the executing agency's accounting years.

IV. PROGRAM FEASIBILITY

A. Socioeconomic feasibility

- 4.1 Uruguay is undergoing an intensive structural adjustment process. At the same time as it is adapting to the timetable for integration with MERCOSUR, it is restructuring its productive sector to meet the challenges of the globalized market. The stabilization efforts of the structural adjustment process during 1995-1998 were based on an exchange anchor, reduction of the fiscal deficit and reform of the State. The new government that took office in March 2000 will continue to face the same macroeconomic problems as the former government, with an economy in recession and deflation and a deficit in the current account.
- 4.2 The adjustment process in Uruguay's economy since it adhered to the Treaty of Asunción in 1991 has taken place in the midst of different crises in the world economy. Growth in GDP was negative in 1995 and 1999 as a result of the 1995 international crisis and devaluation of the *real* in Brazil in January 1999, respectively. Industry was hardest hit by the sharp change in relative prices in Brazil, with production dropping by 8.2% in 1999. The gross investment rate remained stable, averaging 15.7% or slightly below the averages in Argentina (18.4%) and Brazil (20.1%).

TABLE IV-1
Selected Macroeconomic Indicators for Uruguay

	1995	1996	1997	1998	1999
GDP growth rate	-1.5	5.4	4.9	4.6	-3.2
Industrial growth rate	-2.5	3.3	5.6	4.9	-8.2
Share of gross investment in GDP	14.8	15.3	16.0	16.7	15.8

Source: Banco Central del Uruguay

- 4.3 The critical variable in the long term for the Latin American countries, particularly for Uruguay, is the competitiveness of their products on a globalized market. Consolidation of the national innovation system and stronger private investment brought about by technological change are preconditions for self-sustained growth. Public sector interventions in the S&T community are intended to boost capacity to conduct economically relevant research as well as the rate of private-sector investments in R&D, including nonroutine engineering.
- 4.4 The impact of the proposed program will be measured on the basis of the returns obtained on investments. The impact will take three forms:
- An increase in public investment in S&T (subprogram for science and technology development).

- b. An increase in private sector investment in R&D, in cooperation with public research institutions, including universities (subprogram to support company innovation and competitiveness).
- c. A stronger S&T infrastructure, which will promote and expand the flow of information in the sector, with multiplier effects on the economy as a whole (institution-building subprogram).

4.5 The results of the analysis are given in Table IV-2, which shows sharp variations. The projects of companies B and D (column 1) skewed the results upward. The simple average for returns on innovation was 7.24 and the average weighted by the sums invested was 5.79. These numbers are quite optimistic regarding the impact of innovation in Uruguay when compared with those obtained in similar studies for Argentina (3.77 and 4.22) and Brazil (4.59). Therefore, it was decided to consider more conservative parameters for project returns, ranging from 2.5 to 4.5.

TABLE IV-2
Estimate of the Value of Innovation in Uruguay

Project	Investment (1)	Benefits (2)	(2) / -(1)
FINTEC projects			
- Company A	(400,000)	1,293,767	3.23
- Company B	(114,836)	3,337,241	29.06
- Company C	(120,923)	100,990	0.84
- Company D	(198,441)	3,800,252	19.15
- Company E	(59,750)	92,400	1.55
- Company F	(322,151)	386,400	1.20
- Company G	(374,000)	779,000	2.08
- Company H	(116,258)	90,000	0.77
Simple average	(213,295)	1,235,006	7.24
Weighted average using the investment as the weight			5.79
TOTAL	(1,706,359)	9,880,050	

Source: Consejo Nacional de Investigaciones Científicas y Técnicas. Programa CONICYT-BID (1998).

4.6 However, these returns only materialize some time after the investment is made. Therefore, the benefits were discounted so they could be compared with investment costs. A range of three to 10 years and an average of seven years were used in the calculation. The results are shown in Table IV-3.

TABLE IV-3
Simulation of the Internal Rate of Return for Different
Maturity Periods for Investments and for the Hypothetical Value of Innovation

Hypothetical value of innovation	2.5	3.0	3.5	4.5
Maturity periods (years)	Internal rate of return (IRR) %			
	2.5	3.0	3.5	4.5
3	35.7	44.2	51.8	65.1
4	25.7	31.6	36.8	45.7
5	20.1	24.6	28.5	35.1
6	16.5	20.1	23.2	28.5
7	14.0	17.0	19.6	24.0
8	12.1	14.7	17.0	20.7
9	10.7	13.0	15.0	18.2
10	9.6	11.6	13.4	16.2

- 4.7 The impact of the program can be estimated using reasonable hypotheses regarding the extent to which the projects will spur larger private sector investments and better quality the results in S&T research. The hypotheses are based on the relative size and type of project interventions.
- 4.8 The investments in research under the S&T development subprogram (US\$12.2 million) and the institution-building subprogram (US\$4 million) do not contribute directly, in principle, to business activities. However, it is expected that the funding will have a significant impact on increased efficiency and quality of all R&D services in Uruguay, including the enhancement of human capital.
- 4.9 The results for the net present value of the project are shown in Table IV-4.

Table IV-4
Minimum And Maximum Net Present Value for Returns on Innovation
(US\$ million)

Change in returns	Growth in R&D in the private sector							
	Case 1 (2.5)		Case 2 (3.0)		Case 3 (3.5)		Case 4 (4.5)	
Impact hypothesis	Min 10%	Max 20%	Min 10%	Max 20%	Min 10%	Max 20%	Min 10%	Max 20%
5%	67	138	63	133	64	133	64	139
10%	98	170	88	159	88	161	82	157

Notes: Annual benefit = (growth in private sector R&D) (total private sector R&D) (return on innovation) + (total investment) (growth in returns on R&D).

Total benefit = annual benefit/discount rate

Net present value Case 1 = 0.14; Case 2 = 0.17; Case 3 = 0.196; Case 4 = 0.24

Discount rate Case 1 = 0.14; Case 2 = 0.17; Case 3 = 0.196; Case 4 = 0.24

- 4.10 As can be seen, NPV for all scenarios is positive, ranging from US\$67 million in the least-growth hypothesis to US\$170 million. These results demonstrate that the project is justified economically, based on reasonable, conservative hypotheses.

B. Technical feasibility

- 4.11 The analysis of the technical feasibility of the program has been based on an evaluation of two aspects that condition the success of the entire operation. The first is the general situation and the existence of potential clients (SMEs and institutions offering services) that wish to participate in programs of this kind and are willing to pay for the services to be financed. The second is the existence of supply to meet demand for the program.
- 4.12 To directly learn the opinions of potential clients, the program examined a survey on demand for technology in Uruguay conducted by the Industrial Board of Trade, CONICYT and LATU. Seventy-seven industrial companies were interviewed and asked: (i) whether they had management, process or technological problems that needed solving: 73% said they had problems with processes, 32% had problems with products and 51% had management problems; (ii) whether they were interested in participating individually or jointly (with other companies with similar problems and/or with university institutes, laboratories, etc.) in research or technology development programs: 66% were interested in participating in individual programs and 55% in joint programs; (iii) whether they knew about national S&T research institutes or services that could support innovation: 57% said yes; (iv) whether they were interested in participating with a group of companies in quality assurance systems to obtain ISO 9000 certification: 69% were interested; (v) whether they were interested in participating with a group of companies in total quality systems or others: 70% were interested; and (vi) what were their sector investment and/or support priorities: 58% identified automation, 34% information systems, 26% environment, 21% chemistry, 18% energy, 17% biotechnology, 14% communications, 10% microelectronics and 22% had other priorities.
- 4.13 Second, the program examined information provided by consultants contracted by the Economics Department of the Faculty of Social Sciences on demand for S&T in Uruguayan industry in 1998, based on interviews with companies in 22 industrial subsectors and authorities from the Industrial Board of Trade, the National Quality Committee, the Ministry of Industry, Energy and Mines, LATU, the Industrial Design Center, and others. The study found general agreement that the future scenario needed to maintain the competitiveness of Uruguayan industry should be based on a strategy for product differentiation. Development of that strategy would generate higher demand for S&T. In particular, what was needed was a S&T system that would support the implementation of productive processes (including advisory services and training) and the development of new products, especially in areas where the country has comparative advantages. The study concludes that more than one third of companies intend to adapt technology and/or engage in

R&D, while two thirds report interest in developing product design, thus pointing to the development prospects for S&T in industry as a whole.

- 4.14 Third, the program examined the results of a study by consultants contracted by CONICYT in December 1999 on identification of technology problems in agroindustrial chains which studied the strengths and weaknesses of 80 companies belonging to 12 different chains. It shows that: (i) there are companies belonging to those chains that definitely intend to participate in joint activities in areas such as seeds, wool, wood, dairy products, citrus products, paper and cardboard, grain, wine, barley and, honey; (ii) there are companies in the seed, wool textiles, cotton textiles, paper and cardboard, grain, wheat flour, flour milling, wine, meat, honey, clothing, dairy products, rice and prepared meals chains interested in participating in entrepreneurial projects; and (iii) there are companies linked to the agricultural (grain, wheat flour, barley, meat) and dairy sectors which have a strong cooperative tradition and are very interested in an instrument to finance the start up of technology management centers which will carry out some of the activities they have been unable to pursue owing to problems with internal capacity.
- 4.15 The fourth element is the research of interest to industry being conducted in the Universidad de la República. The competitiveness agendas mentioned earlier note that the university is carrying out over 100 R&D projects intended to create innovations in products, processes and business management. Developments in areas such as genetic improvement of dairy goats, use of agroindustrial waste, techniques for designing low-consumption, low-feed-voltage analog integrated circuits, design of integrated microconsumption signal-conditioner circuits for sensors, etc. are of particular interest.
- 4.16 As for **public supply**, the country has a large number of units involved in S&T research and technology services. The following agencies carry out the bulk of those activities: (i) the Technology Laboratory of Uruguay (LATU); (ii) the Uruguayan Technical Standards Institute (UNIT); (iii) the National Agricultural Research Institute (INIA); (iv) the Universidad de la República, which conducts research in the Faculties of Science, Engineering, Chemistry and Agronomy; and (v) the National Fisheries Institute (INAPE). These institutions engage in research, technology development, dissemination and teaching and their coverage is national. In recent years, they have worked hard and successfully to achieve closer ties with the productive sector and are tending to gear their activities to private demand. The actions by INIA, the Business-University Relations Department of the Faculty of Chemistry and the joint work by the Faculty of Engineering with public and private companies can be cited as examples. With respect to the supply for subprogram II, the proposed program will be a continuation of the previous one and will be similar in scale.
- 4.17 There is also a considerable **private supply** of technology services for companies, composed of: (i) local and international suppliers of capital goods; (ii) software

producers/marketers; (iii) consultants on organization, finance, marketing and production solutions; and (iv) consultants in sectors where agroindustry is a strong developer of technology and transfers to the agricultural sector. Examples include agroindustries in the rice, malting, dairy products, wool and citrus fruit industries. Examples of nonprofit entities engaged in generating, adapting and disseminating S&T knowledge include the Uruguayan Industrial Board of Trade, the Technology Management Center (CEGETEC) and the Management Training Center (CEAD), which carry out programs to support industrial management and provide related services in the first two cases, and to support agriculture in the third. They perform diagnosis of the weak points of companies and provide consulting services to surmount them, promoting associativity and providing support through training. The proposed program will be complemented by actions financed by the MIF for the following institutions: the Uruguayan Industrial Board of Trade, the National Association of Microenterprise and Small Business (ANMYPE), the Uruguayan Association of Retailers, Bar Operators and Allied Trades (CAMBADU) and the United Nations EMPRETEC program.

C. Institutional and financial feasibility

- 4.18 The way in which program execution has been organized (see chapter III) will make for efficient and rational use of program funds and transparency in decision making. It takes the lessons learned from the previous program and the recommendations of the international experts who analyzed it into account. The proposed institutional structure meets the Bank's requirements for executing operations of this kind.
- 4.19 The local contribution to the program for 2001 was included in the 2000-2004 national budget submitted by the executive to the legislature on 31 August 2000, which is expected to be passed without change.

D. Gender and environmental aspects²²

- 4.20 Specialized local consulting services will be engaged to include **gender** considerations in all program activities. The consultant will be responsible for including this aspect in the PCU's information systems and in human resource training programs.
- 4.21 The **environmental impact** of the projects to be financed will be analyzed as an integral part of project evaluation. In many cases, activities under the program will improve and protect the environment. Potential negative impacts will be identified early on in the analytical process, which will enable the PCU to include mitigation measures in the proposals or to reject them. Account taken of the mechanisms to be used in the program, it will be environmentally feasible.

²² CESI reviewed this operation at its meeting on 14 May 1999.

- 4.22 The proposed program will not finance new buildings and is not expected to have major negative environmental impacts. On the contrary, it will reinforce actions already begun to support research on environmental protection and the development of clean technologies in innovative projects. The operating regulations include specific criteria to ensure that the projects financed adopt measures for suitable waste management, particularly of laboratory materials and substances.
- 4.23 The program does not specify explicit performance indicators to measure poverty reduction or improvements in social equity. It is not targeted to low-income groups and does not qualify as a PTI.

E. Program benefits and risks

- 4.24 The program will help to boost Uruguay's capacity in science and technology and consolidate the progress made under the previous Bank program. The present program has been designed to promote innovation and technological development in the productive sectors, the quality and relevance of research projects, the development of human resources specializing in S&T research, and the linkage between research centers and the potential users of their results.
- 4.25 Better linkage among the different players in the national innovation system, particularly between the academic community and the productive sector and participation by researchers in solving problems that are relevant for the country's development, will also help to improve the pertinence of the country's academic programs.
- 4.26 Building up the country's S&T capacity is a necessary but insufficient condition for modern development. Demand and interest by producers must exist if that capacity is to bring the expected benefits. To that end, the proposed program will carry out a series of concurrent actions, such as cofinancing for joint projects, identification of areas of opportunity, advisory services for companies and support for technology management centers and business incubators, to promote and facilitate linkage between companies, especially smaller ones, with sources of knowledge and scientific and technological information.

TECHNOLOGY DEVELOPMENT PROGRAM
Logical Framework
(Summary)

SUMMARY OF OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
PROGRAM OBJECTIVE			
the country's innovation potential its production more competitive, SMEs that produce goods and	<p>Increase in the competitiveness of the companies benefiting from the program.</p> <p>Increase in the domestic and foreign market shares of the beneficiary companies.</p> <p>Increase in private spending on science and technology.</p> <p>Increase in the impact of S&T on processes to improve the production of goods and services.</p>	<p>Follow-up reports on program beneficiaries and the industrial survey</p> <p>Follow-up reports on program beneficiaries and the industrial survey</p> <p>Follow-up reports on program beneficiaries and the industrial survey</p>	<p>Companies that produce goods and services are to be interested in systematically increasing technology and scientific knowledge.</p> <p>Improvements in company management, quality and diversification.</p> <p>The private sector is interested in innovation.</p> <p>Policy to promote SMEs and their management.</p>
PROGRAM PURPOSE			
sustained growth in innovation production, use and adaptation of new products, production, management processes and to strengthening S&T	<p>Increase in the number of publications by researchers, technical experts and entrepreneurs in national journals, juried international journals, congresses, seminars and bibliographic citations.</p> <p>Increase in spending on S&T by the beneficiary companies (total spending on S&T/company sales).</p> <p>Maintenance of the current scientific base and increase in the critical mass devoted to S&T research.</p>	<p>Reports by international databases Research/projects produced Registry of universities and research centers</p> <p>Company records</p> <p>Current number of S&T researchers. Increase in investigators in new areas. Post-graduate courses in new areas.</p>	<p>Companies and research institutions are interested in S&T jointly.</p> <p>The policy to promote S&T is maintained.</p> <p>Uruguay's participation in regional and international S&T projects increases.</p>
SUBPROGRAM 1: SUPPORT FOR INNOVATION AND INCREASED COMPETITIVENESS			
PROGRAM OBJECTIVE			
sustained growth in innovation production, use and adaptation of new products, production, management processes, and to strengthening S&T	<p>35% of beneficiary companies are able to diversify their production (portfolio of projects and services with and without the project).</p> <p>30% of beneficiary companies increase their sales in US\$ (sales volumes with and without the project).</p> <p>10% of beneficiary companies win new markets (number of markets with and without the project).</p>	<p>Project database (difference between base 0 and the end of the program).</p> <p>Project database. Company sales records</p> <p>Company sales records (base 0 and end of the program)</p>	<p>There are no major obstacles to access to technology and expanding production.</p>
	<p>50% of the beneficiary companies boost their competitiveness (market share with and without the project).</p> <p>30% of the beneficiary companies enter into agreements with research centers.</p>	<p>Program database. Evaluation reports</p> <p>Agreements signed by companies and research centers</p>	<p>Research institutions in the NIS provide solutions to socioeconomic problems and increase their competitiveness.</p> <p>Companies and research institutions are interested in S&T jointly and are interested in developing new products.</p>

SUMMARY OF OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
PURPOSE			
<p>participating in the program apply technology services (production, management) which permit them to produce more competitive products and services with an estimated 150 companies will participate (program 1).</p>	<p>40% of companies obtain results that will permit them to improve the quality of their products (prices, ISO certification, access to new markets):</p> <p>Year 1: 0 Year 2: 10 Year 3: 10 Year 4: 40</p> <p>40% of companies obtain results that will permit them to produce new products (patents, utility models, etc.):</p> <p>Year 1: 0 Year 2: 10 Year 3: 20 Year 4: 30</p> <p>50% of companies obtain results that will permit them to produce more competitive products (prices, percentage of market share):</p> <p>Year 1: 0 Year 2: 10 Year 3: 25 Year 4: 40</p> <p>70% of companies obtain results that will permit them to improve their business management:</p> <p>Year 1: 0 Year 2: 15 Year 3: 30 Year 4: 60</p>	<p>Certifications obtained Program database Evaluation reports</p> <p>Program database Evaluation reports New registrations (e.g.: industrial property)</p> <p>Program database Records on sector performance in the market</p> <p>Program database Increased qualifications of company staff</p>	<p>Companies place stress on raising the production standards.</p> <p>Companies maintain their interest in innovation. The country's macroeconomic performance will not suffer significant changes.</p> <p>The companies are interested in incorporating new technologies (closer linkage between companies and research centers).</p>

SUMMARY OF OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
SUBPROGRAM 2: DEVELOPMENT AND APPLICATION OF SCIENCE AND TECHNOLOGY			
PROGRAM OBJECTIVE			
sustained growth in innovation ation, use and adaptation of new products, production, management processes, and to strengthening S&T	Maintenance of the current scientific base and increase in the critical mass devoted to S&T research. Number of agreements between companies and research centers. Increase in publications by the country (national journals, international juried journals, congresses, seminars, etc.).	Current number of S&T researchers Increase in researchers in new areas Development of postgraduate programs in new areas Agreements registered and signed NIS database and project follow-up reports	Interest by NIS institutions and agen Policy (from the supply side) promot by the other sectors (demand side).
PURPOSE			
al S&T institutions maintain and acity to generate and apply S&T as of opportunity and basic	Increase of at least 15% in the number of publications by program beneficiaries in year 2 of the program. Increase of at least 10% in postgraduates and traineeships in year 3 of the program. Increase of at least 15% in researchers by area in year 2 of the program. Increase of at least 20% in research by nonprofit national research institutions associated with companies.	Project follow-up reports Registers of academic institutions Project follow-up reports MEC database Number of agreements/projects under way	Academic institutions are interested i programs. Private sector and nonprofit national institutions are interested in joint wor Academic institutions are interested i postgraduate programs. Private sector and nonprofit national institutions are interest in joint work.
SUBPROGRAM 3: INSTITUTIONAL STRENGTHENING			
PROGRAM OBJECTIVE			
sustained growth in innovation ation, use and adaptation of new products, production, management processes, and to strengthening S&T	The increase in innovation and technology development projects boosts national capacity. Closer ties among NIS institutions spur the country's technological development and make it sustainable.	Number of project approved by CONICYT Policy instruments designed	Institutions participating in the NIS a applying innovative technologies.
PURPOSE			
e national innovation system (NIS) operate in coordination and develop national linkages.	Increase in the quality and efficiency of the S&T institutions in the Uruguayan NIS.	Increase in the activities of the institutions participating in the NIS Number of agreements and joint activities reported	NIS institutions are interested and ab consensuses.

Complete version of the logical framework is available in the technical files of RE1.

**TECHNOLOGY DEVELOPMENT PROGRAM
(UR-0110)**

Tentative Procurement Table

Main program procurements (US\$ thousands)		Financing	Method	Prequalification	Dates Semesters
Goods (as part of projects) Total estimated value US\$7,300 Technical equipment of different kinds will be procured, including instruments for measurements and processes, laboratories, computers, etc. Small civil works will be built. Given the individual and innovative nature of the projects, lots of specific bids cannot be determined. The figures will be adjusted each year.					
Equipment	Year 1, multiple calls, US\$400	IDB 60%	LB	No	I/01, II/01
	Year 2, multiple calls, US\$600	"	LB	No	I/02, II/02
	Year 3, multiple calls, US\$800	"	LB	No	I/03, II/03
	Year 4, multiple calls, US\$1,200	"	LB	No	I/04, II/04
	Year 5, multiple calls, US\$1,200	"	LB	No	I/05, II/05
Civil works	Year 1, multiple calls, US\$200	"	LB	No	I/01, II/01
	Year 2, multiple calls, US\$400	"	LB	No	I/02, II/02
	Year 3, multiple calls, US\$400	"	LB	No	I/03, II/03
	Year 4, multiple calls, US\$600	"	LB	No	I/04, II/04
	Year 5, multiple calls, US\$200	"	LB	No	I/05, II/05
Inputs	Year 1, multiple calls, US\$100	"	LB	No	I/01, II/01
	Year 2, multiple calls, US\$200	"	LB	No	I/02, II/02
	Year 3, multiple calls, US\$300	"	LB	No	I/03, II/03
	Year 4, multiple calls, US\$300	"	LB	No	I/04, II/04
	Year 5, multiple calls, US\$300	"	LB	No	I/05, II/05
Library	Year 1, multiple calls, US\$20	"	LB	No	I/01, II/01
	Year 2, multiple calls, US\$20	"	LB	No	I/02, II/02
	Year 3, multiple calls, US\$20	"	LB	No	I/03, II/03
	Year 4, multiple calls, US\$20	"	LB	No	I/04, II/04
	Year 5, multiple calls, US\$20	"	LB	No	I/05, II/05
Services (as part of projects) Total estimated value US\$31,250 Projects include contracting individual and institutional experts, consultants and researchers. Owing to the special nature of each project, the figures presented are aggregates of all the projects anticipated each year. Contracts are not expected to cost more than US\$200,000. The figures will be adjusted each year.					
Year 1, multiple calls, US\$2,000		IDB 60%	LB	No	Calls year-round during execution
Year 2, multiple calls, US\$3,500		"	LB	No	
Year 3, multiple calls, US\$6,500		"	LB	No	
Year 4, multiple calls, US\$9,000		"	LB	No	
Year 5, multiple calls, US\$10,250		"	LB	No	
Training services Total estimated value: US\$3,150 Specialized training will be financed as part of the projects, including grants. Owing to their individual nature they cannot be defined in advance. However, specific calls for bids will be held.					
Year 1, multiple calls, US\$200		IDB 60%	LB	No	Multiple calls during execution
Year 2, multiple calls, US\$350		"	LB	No	
Year 3, multiple calls, US\$650		"	LB	No	
Year 4, multiple calls, US\$950		"	LB	No	
Year 5, multiple calls, US\$1,000		"	LB	No	
LB-Local bidding					

PROPOSED RESOLUTION

**URUGUAY. LOAN /OC-UR
Technology Development Program**

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 Oriental Republic of Uruguay, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a Technology Development Program. Such financing will be for the amount of up to thirty million dollars of the United States of America (US\$30,000,000), which are part of the Single Currency Facility of the Ordinary Capital resources of the Bank, and will be subject to the "Special Contractual Conditions" and the "Financial Terms and Conditions" of the Executive Summary of the Loan Proposal.