Cooperative Research and Development Project between FUB/CDT and TERRACAP

Technical and Economic Feasibility Study for
Digital Capital Technology Park
[Parque Tecnológico Capital Digital – PTCD]

Product 5.9 – Feasibility Analysis – Conclusion	
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CONTENT

1 INTRODUCTION

Companhia Imobiliária de Brasília (Terracap), established through Law No. 5861, of December 12th, 1972, is a state-owned enterprise under the Government of the Federal District (GDF). It is governed by the law under which it was established, its articles of incorporation and the applicable law of corporations, and Terracap's purpose is to operate in the real estate business for the best interest of the Federal District in exchange of compensation, and this business comprises use, acquisition, management, provision, development, encumbrance or disposal of properties.

Pursuant to Law No. 4586, of July 13th, 2011, Terracap also took on the role of Development Agency for the Federal District by designing, deploying and implementing economic and social development programs and projects for the Federal District, and it may also foster public-private partnerships, incorporation of special purpose companies (SPEs) and engage in urban joint ventures for the deployment and development of projects considered to be strategic by the Government of the Federal District. In view of this backdrop, Terracap plays a key role in the public policies included in programs that are being implemented by the Federal District Government, in particular with regard to the Parque Tecnológico Capital Digital [Digital Capital Technology Park] – PTCD.

Considering the existing collaboration between the University of Brasilia Foundation (FUB) and the Ministry of Planning, Budget and Management's Federal Property Department – SPU established in January 2009, with coordination of the Decision Making Technology Laboratory – LATITUDE, University of Brasilia's Department of Electrical Engineering, through three projects for the development of SPU's processes, methodologies and management tools, Terracap realized that the approach to dealing with Federal property can be extended and applied to Federal District's properties, in particular to the management of the PTCD project.

Furthermore, issues related to the PTCD implementation strategy have been addressed in previous studies conducted by UnB upon request by the GDF (FAPDF-FUB Project, 2008), thus enabling management of PTCD to be addressed on an informed basis. This experience underpins the participation of the LATITUDE Laboratory team this in this new environment. Also, the PTCD is an information and communications technology park and its feasibility study will need to provide answers to questions such as: type and size of companies in the ICT sector that can operate at the park; types of services and products with the greatest potential; labor capabilities, existing and required professional

skills (electrical, network, computing, production, and automation and control engineers, computing and information scientists, technologists); academic institutions in a position to research, innovate and transfer technologies to the park, etc.

In view of the above, and considering CDT/UnB's extensive experience in the preparation of technical and economic feasibility studies (TEFS), Terracap and the LATITUDE Laboratory, with support from CDT/UnB, started discussing the possibility of conducting a cooperative research and development project in order to carry out a TEFS for the PTCD with a view to improving the Federal District's property management and fostering strategic ventures for the Federal District.

As a result, an agreement has been established between Terracap and FUB for the development a technology and information services project to support implementation of the PTCD, with preparation of the products that will make up the respective Technical and Economic Feasibility Study.

Project deliverables includes "Product 5.9 – Feasibility Analysis – Conclusion," which is covered in this technical report.

The purpose of this product is to list the conclusions provided by the study in order to reflect an operating, tactic and strategic stance regarding Terracap's support to establishment of the PTCD.

2 SUMMARY OF THE STRATEGIC PLANNING FOR THE PTCD

The starting point of the strategic planning for the PTCD was an analysis of the environment for the establishment of the Park. In view of the PTCD's potential to attract domestic and international investors, this analysis took into consideration outlooks of world politics and economics, as well as national and local aspects to the Federal District. On the other hand, since this is a venture in the information and communication technology industry (IT/ICT), an outlook of this sector is also necessary.

The situation analysis for the PTCD was conducted against this backdrop, and it included a survey and review of its strengths and weaknesses, and opportunities and threats. Future scenarios were then prepared to allow for the selection of strategic alternatives for the PTCD, which in turn allowed for the definition of its objectives, goals and actions.

A summary of the results afforded by this approach is presented below.

2.1 Analysis of the Environment for the Establishment of the PTCD

As far as the global outlook is concerned, there is every indication that such a prosperity-recession-rebound cycles of the world economy should continue into the 21st century and over the next 35 years – period during which the PTCD will be developed. Thus, management of the PTCD should follow these cycles, which will refresh perceptions about the situation and redefine its strategy accordingly.

With regard to the Brazilian outlook, global actors find it worthwhile to investment in Brazil, and that the existing problems are known and their risk has been assessed. Hence, from that perspective, this seems to be a good time to launch the PTCD. However, foreign investment as well as domestic investment will selectively go to those projects with the best potential for success. It is up to the Federal District to show that the PTCD is one of these projects by coordinating actions for the establishment of the Park in tandem with incentives to attract investors and encourage ST&I ventures in the ICT industry.

In view of this, the outlook for the Federal District provides both strengths and weaknesses:

- Remarkable market for Information and Telecommunication Technology solutions. second market for ICT in Brazil;

- The area chosen for the PTCD to be established is of great quality and highly suitable;
- The Federal District has been facing challenges related to infrastructure, healthcare services, education services, public security and the related capabilities;
- Socioeconomic inequalities between administrative regions and between the Federal District and its metropolitan area;
- Political challenges;
- Difficulties in meeting the science and technology agenda.

On the other hand, the outlook for the ICT sector seems quite favorable to the PTCD. The international outlook shows that:

- By 2020, the ICT industry will have a turnover of US$5 trillion, from US$1.7 trillion at the end of 2011;
- Increased spending on ICT around the world: 7% in 2011, and this is expected to hold at 6.9% in 2012;
- In emerging markets – particularly the BRICS – in 2012, ICT spending will grow by 13.8%, which accounts for 53% of global growth;
- The only potential barrier to such development is the economic and political situation in Europe.

Now, this is the outlook for the domestic ICT Industry (source: BRASSCOM):

- The information services sector increased by 4.9% in 2011, 3.8% in 2010, over 4% in 2009 (above the national GDP growth rate), and was ahead of more prominent sectors, such as construction, the processing industry and trade.
- About 1.2 million workers, with an average salary of R$2,950.00;
- Shortage of IT professionals is estimated at 115,000 people;
- A turnover of US$96 billion makes Brazil the sixth largest IT market in the world;
- Over the next 10 years, the turnover is estimated to come to R$220 billion, which may account for 6.5% of the GDP;
- Between 2003 and 2009 the number of information services companies jumped

from 55 thousand to 70 thousand;

- There is a need for 750 thousand new ICT workers by 2020 in order to achieve the goal of accounting for 6.5% of the GDP;
- The market is dominated by multinationals, but some Brazilian companies have also outperformed;
- Primary IT markets in Brazil: São Paulo, Rio de Janeiro, Federal District, Paraná, Minas Gerais, Bahia, Pernambuco, and Rio Grande do Sul;
- A serious problem regarding skilled labor: there is demand for 78,000 workers by 2014, but only 33,000 will have completed training programs by then;
- Dropout rate in university-level IT programs: 87% in 2010;
- As a result of these shortcomings, Brazil's IT industry is still dependent on the domestic market: Exports worth US$2.65 billion in 2011 account for less than 3% of the global market.

Under such circumstances, although the initial period of deployment may suffer the impact of the recession (for example, European investors may be risk-averse to new investment), there seems to be capital available (from Asia, the United States, or from another foreign source and even from Brazil) for private partners to join the PTCD business, especially considering how the ICT industry operates.

The ICT sector's landscape, its progress over recent years, the current situation and the prospects for growth in the long term continue to point to a favorable environment for the establishment of a technology park with a focus on ICT, such as the PTCD. The challenges lie mainly in shortcomings related to skilled labor and reliance on foreign stakeholders.

2.2 Analysis of the PTCD'S Situation

The following strengths have been identified for the PTCD:

- Terracap has a mandate as a real estate administrator and as a development agency for the Federal District;
- Quality of the area for the PTCD;
- The PTCD is considered to be a strategic project for the GDF;

- Well-established IT companies operating in the Federal District;
- The Federal District's perceived excellence in teaching, research and extension;
- Promotion programs sponsored by the local government;
- Dedicated funding to the area and tax incentives for R&D in the Mid-West region;
- Major volume of government procurement and investments in the ICT sector.

However, the following weaknesses have been identified:

- Issues in budget allocation and implementation regarding the field of science, technology and innovation within GDF;
- Lack of follow-up as administrations change and lack of autonomy regarding PTCD-related actions. It has been taking a long time (more than 10 years) for the Park to be established;
- The GDF and the private sector's lack of experience with public-private partnerships in Brazil;
- Problems to understand and agree on the legal framework and governance framework for the PTCD's managing entity;
- Absence of specific, consistent public policies for the establishment of technology parks;
- Lack of investments and an aggressive policy of incentives for research, development and innovation in the ICT sector;
- Uncertainty regarding tax issues for the ICT sector.

As far as the external environment is concerned, the following opportunities for a project such as the PTCD have been identified:

- Tendency towards investing in clean and sustainable projects;
- Industry growth is above the average for the Brazilian and the global economy;
- High demand for ICT by the federal district and the federal governments;
- Growing interest of foreign companies in investing in the BRICS countries;
- International investments targeted at the ICT sector;

- Transnational companies seeking to operate in the Federal District;
- Potential to create approximately 1,200 technology-based ventures and 25,000 jobs;

The potential exploitation of such opportunities should reconcile solutions and countermeasures to the following threats:

- Successive GDF administrations have failed to prioritize State programs such as the PTCD;
- Lack of non partisan political concertation for the project;
- Slowness of decisions on the implementation schedule;
- Ignorance on the part of the private partner of world-class projects for technology parks and the public-private partnership approach;
- Risk aversion causing funding to be shut off to support the project;
- Ignorance on the part of potential investors of the PTCD and its positive features;
- It is difficult to bring together qualified workers to support development of the project;
- Difficulties involving methods, processes, organization, and personnel;
- Conflicts of interest among participants;
- Competition of other technology parks.

2.3 Scenario Building

Once the key aspects of the environment and the characteristics of the PTCD were identified, the following future scenarios were developed:

- In a null scenario, the GDF opts for inaction, which seems very unlikely;
- Under the pessimistic scenario, the PTCD fails dues to insurmountable problems at the bidding process and the park's management: this is considered to be very unlikely, but if it does materialize, it is a reversible situation because Terracap could turn the project into a real estate venture;
- The optimistic scenario that is fully successful and problem-free is unlikely given

the complexity and duration of the project;

- Thus, the realistic scenario is one in which establishment of the PTCD is viewed as a project to be managed on an ongoing basis, where its strategy is adapted in light of the results obtained in the various actions related to the PTCD (such actions are discussed later in this document). To this end, Terracap should have its own team to manage the project, in particular as concerns the following items:
    - Management of the bidding process from selection of the private partner to incorporation of the PTCD's managing company.
    - Specific process for the management of a public-private partnership, with adequate management tools and database.

2.4 Strategic Choices for the PTCD

Once the most likely future scenario had been developed and the positive results from concurrent analysis of technical and economic feasibility (these results are discussed later in this document) were reviewed, the parameters for the goals of the PTCD were specified, with the following results:

- ***Focus***

    - Operate in the information and communication technology sector;
    - Coordinate training, research, innovation, development of products and services, transfer of technology to the market, entrepreneurship, economic policy (for the Federal District), public promotion, and other classes of correlated activities.

- ***Segmentation***

    - Initially, no segmentation of products, services, types of customers, geographic areas, etc.;
    - The PTCD venture may explore the entire potential information and communication technology market;
    - Monitoring of the implementation process will possibly help outline a leadership

strategy in a given segment (for instance, governmental software) that is associated with a strategy where no differentiation is made for the other segments.

Vision

- To be a locus of innovation and development in the field of information and communication technology that generates competitive solutions in the global market.

Mission

- To promote employment, income and quality of life in the Federal District through information and communication technology ventures.

Goals

- Conclude the process for the selection of the private partner and incorporate the PTCD's managing company by late 2012;
- Complete the definition of GDF's policies to support the PTCD and approve them by the end of 2012;
- Build SECTI/FAPDF's building during the period 2012-2014;
- Run a marketing campaign for the launch of the PTCD by July 2012;
- Establish the PTCD in 4 rounds of investment (based on the alternatives for processing the waste substrate in Lot 1, and based on a buildable area of 287,669.40 square meters, 15% of which being for communal use):

Phase	*Terracap's Investment (R$)*	*Partner's Investment (R%)*	*Built Area (%)*	*Construction Aggregate (%)*
Initial	1,080,000,000.00	243,052,509.84	17%	17%
Year 1	0.00	407,165,754.71	23%	50%
Year 2	0.00	273,463,637.99	25%	75%
Year 3	0.00	291,028,981.11	25%	100%

- Generation of jobs/ventures, also based on a total buildable area (Product 5.1) of 287,669.40 sq m, 15% for communal use:

Business size	*Area per business (sq m)*	*Number of companies*	*Corporate area (sq m)*	*Direct jobs by company*	*Direct jobs - PTCD*
SME	45	712	32,040	5	3,560
Medium	200	340	68,000	20	6,800
Medium/ Large	500	141	70,500	50	7,050
Large	2000	37	74,000	200	7,400
TOTAL		1230	244,540		24,810

Actions

- List of actions to implement a strategy that helps achieve the stated objectives based on a long-term vision, but through actions with a shorter term that are proportionate to the effort, which may be subject to a schedule that takes into account priorities and checkpoints;
- Terracap's actions regarding the public-private partnership:
  - Complete bidding process for selection of the private partner and incorporate the PTCD's managing company;
  - Start establishment of the PTCD and focus on monitoring its establishment and activities;
- Terracap's preparatory and additional actions:
  - Activities related to maintenance of the PTCD's premises;
  - Procurement of electricity supply for the PTCD – CEB;
  - Procurement of deployment of a water supply and sanitation system for the PTCD – CAESB;
  - Procurement of drainage and paving for the PTCD – NOVACAP;
- Terracap's actions under a partnership with the private sector:
  - Supervision of construction works for Banco do Brasil and CEF's Datacenter
  - Supervision of the project to set up BRB's Datacenter at the PTCD;
  - Inclusion of the Federal District's Construction Union (SINDUSCON) in the PTCD Project;

  - Attraction of investments to the PTCD;
- Actions by the Science, Technology and Innovation Department (SECTI):
  - Master Plan for Science, Technology and Innovation Development (PDCTI) in the Federal District;
  - Update and Re-enact the GDF's Agenda for Science and Technology (Decree No. 25752/2005);
  - Reconcile FAP-DF's programs with the PTCD's thematic area;
  - Build FAP-DF's headquarters in a neighboring area to the PTCD;
  - Policies to support the PTCD;
  - Attraction of RDI organizations in the ICT industry to the PTCD;
  - Entrepreneurship Program for the Creation of New Technology Companies (NEBT);
  - Training program for PTCD's workers;
  - Implement professional training programs for PTCD's managers;
  - Implement a foreign language training program for PTCD's workers;
- Joint actions involving SECTI, SEFAZ and TERRACAP
  - GDF's Tax Incentives Policy Program (PPIF) for the PTCD;
  - Resident Business Preference Policy (PPE) in the PTCD for government product and service procurement (the federal and local government);
- Given the significant potential for challenges and problems, you must have a process in place to monitor and review implementation of the strategy. This process must employ the indicators specified in the goals for the PTCD;
- This process can be implemented through cooperation between the PTCD's Technical and Scientific Council (unit under the management of the PTCD) and the dedicated team for the management of the PTCD project by Terracap (external verification, contract supervision, public-private partnership control);
- Terracap's team for the project;
  - Assignment of power to manage such actions, with the choice of implementation approaches, selection of partners, contracting, etc.;
  - These actions will influence the benchmark needed for monitoring the results for the purpose of verifying compliance with the goals;
  - Maximum care in the preparation of the study and in setting the rules for the bidding process with a view to complying with the current rules in

both federal and local level (TCDF Resolution 189);

- In this process, the status of actions must be continuously checked against deadlines for the achievement of goals, especially the key actions planned for the period 2014-2017.

3 SUMMARY OF PROSPECTION FOR ALLIANCES AND PARTNERSHIPS

The importance and even the need to put together a network of alliances for the PTCD was highlighted, which is deemed to be a critical factor for the success of the venture.

Once the focus, vision and mission of the PTCD were defined, a survey of potential organizations for alliances and partnerships was developed, and criteria were defined to assess the relevance of partnerships, which led to the development of a matrix of potential benefits from alliances and partnerships as shown in the following summary.

3.1 Potential Alliances and Partnerships

Partnerships with the Federal District Government:

- FAP-DF – Federal District's Research Support Foundation
- SECTI-DF – Science, Technology and Innovation Department
- SEFAZ-DF – Federal District's Finance Department
- SDE-DF – Economic Development Department
- NOVACAP – Urbanization Company for the New Capital of Brazil
- CEB – Brasilia Energy Enterprise
- CAESB – Federal District's Environmental Sanitation Enterprise
- BRB – Bank of Brasilia

Partnerships with the Federal Government:

- UnB – University of Brasilia
- MDIC – Ministry of Development, Industry and Foreign Trade
- MEC – Ministry of Education
- MCTI – Ministry of Science, Technology and Innovation (with FINEP and CNPq)
- ApexBrasil – Brazilian Agency for the Promotion of Exports and Investments

- SUDECO – Superintendency for the Development of the Mid-West Region
- Brazilian Tax Administration

Public, State-Owned and Strategic Enterprises:

- BNDES – Brazilian Development Bank
- PETROBRAS – Petróleo Brasileiro S.A.
- EMBRAPA – Brazilian Agricultural Research Corporation
- EMBRAER – Brazilian Aeronautics Company S.A.
- BB – Bank of Brazil S.A.
- CEF – Federal Savings Bank
- SERPRO – Federal Data Processing Service

Private Alliances and Partnerships, national level:

- SEBRAE – Brazilian Micro and Small Business Support Service
- Anprotec – National Association of Entities Promoting Innovative Ventures
- ABDI – Brazilian Agency for Industrial Development
- Anprotec – National Association for Research, Development and Engineering of Innovative Companies
- SOFTEX – Association for the Promotion of Brazilian Software Excellence

Private Alliances and Partnerships at international level:

- IASP – International Association of Science Parks
- AURP – Association of University Research Parks
- Other foreign technology parks

Local alliances

- FIBRA/SESI/SENAI/IEL System
- SINFOR – Federal District Information and Communications Technology Industry Association
- Private universities
    - Catholic University of Brasilia – UCB
    - Centro Universitário de Brasília – UniCEUB
    - Other higher education institutions and colleges

3.2 Criteria for the Assessment of Alliances and Partnerships

PTCD's cooperation with other partners from the public and private sectors at local, national and international level makes it possible to meet the goals in different ways. Hence, the following criteria for the assessment of benefits from partnerships have been proposed:

- Promotion;
- Product innovation;
- Cost reduction;
- Market penetration;
- Scale;
- Increase in competitiveness;
- Funding;
- Logistics support.

3.3 Alliance and Partnership Benefit Matrix

The potential alliances and partnerships and their benefits for the operation of a technology park are quite diverse and hard to predict. Thus, the matrix simply specifies positive indicators as a function of the institutional nature of each entity, even though their management styles, in parallel with the PTCD, has a real potential to generate benefits associated to aspects other than those identified in this matrix.

Entity	Type	Promotion;	Product Innovation;	Cost Reduction;	Market Penetration;	Scale;	Increase in Competitiveness;	Funding;	Logistics Support
FAP-DF	Local Government Body	Yes						Yes	
SECTI-DF	Local government body							Yes	
SEFAZ-DF	Local government body			Yes					
SDE-DF	Local government body			Yes			Yes		
Novacap	Semi−Public Corporation						Yes		Yes
CEB	Semi−Public Corporation						Yes		Yes
CAESB	Semi−Public Corporation						Yes		Yes
BRB	Semi−Public Corporation						Yes	Yes	Yes
UnB	Public University		Yes				Yes		
MDIC	Federal Government Body				Yes		Yes		
MEC	Federal Government Body	Yes							
MCTI, FINEP, CNPq	Federal Government Body	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ApexBrasil	Federal Government Body				Yes	Yes			Yes
SUDECO	Federal Government Body	Yes							
Receita Federal (Tax Adm.)	Federal Government Body			Yes					Yes
BNDES	Federal State-Owned Enterprise							Yes	
Petrobrás	Semi Public Corporation				Yes	Yes			
EMBRAPA	Federal State-Owned Enterprise		Yes				Yes		
EMBRAER	Private Company				Yes	Yes			

Entity	Type	Promotion;	Product Innovation;	Cost Reduction;	Market Penetration;	Scale;	Increase in Competitiveness;	Funding;	Logistics Support
BB	Semi Public Corporation		Yes	Yes	Yes	Yes	Yes	Yes	
CEF	Semi Public Corporation		Yes	Yes	Yes	Yes	Yes	Yes	
SERPRO	Government Organization		Yes		Yes	Yes	Yes		
SEBRAE	Private Organization			Yes	Yes				
Anprotec	Private Organization				Yes	Yes			
ABDI	Private Organization				Yes	Yes			
ANPEI	Private Organization				Yes	Yes			
SOFTEX	Association	Yes			Yes			Yes	Yes
IASP	Private Organization				Yes	Yes			
AURP	Private Organization				Yes	Yes			
Embraer	Private Company		Yes		Yes	Yes			
FIBRA, SESI, SENAI, IEL	Private Organization		Yes	Yes	Yes		Yes		
SINFOR	Private Organization				Yes		Yes		
UCB	Private University		Yes						
UniCEUB	Private University		Yes						

4 SUMMARY OF FEASIBILITY ANALYSIS

4.1 Technical Feasibility

The technical feasibility analysis was based on the projected infrastructure and services of the PTCD's managing company. At the same time, the economic feasibility study for the PTCD is based on the return from the provision of this shared infrastructure and services, and it takes into consideration the cost to deploy such an infrastructure and operate it.

Specifically, the Managing Company will be responsible for exploring the following products and services commercially, considering the park's profile, which is intended to provide information and communication technology products and services:

- Water and sewage;
- Electric power;
- Security and building maintenance (general services);
- Real estate (location, built to suit, built to suit and operate, co-location, among other possible legally, except for a transfer of ownership to third parties);
- Operations in ICT - Network and system (datacenter, storage, etc.) management services, and voice and data communication:
    - Data communications network;
    - Ultra-broadband Internet;
    - Broadband wireless Internet;
    - Corporate telephony;
    - Videoconferencing;
    - CCTV (Closed Circuit Television);
    - Website and content hosting;
    - E-mail;
    - Network management and support.

The costs and returns related to such items were estimated and used as the basis for the analysis on the economic feasibility described later in this document.

However, it is reasonable to predict that the managing company of the Park may also

have return from other activities that are under its direct administration or in association or subcontracting with third parties. These include:

- Convivial services: food, fitness, banking, retail, convention center, hospitality;
- Incentive to technology innovation: participation in joint ventures, development of an investment fund for the PTCD, allocation of risk capital, etc.;
- Encouragement of cooperative interactions between the institutions operating at the PTCD: participation in research and development activities, patenting and copyright management, incubation, establishment of startups, etc.

Estimating costs and returns related to such items is more susceptible to uncertainties at the present moment, but the managing company of the PTCD may set up a specific unit to look into such possibilities, regardless of the technical feasibility assessment since such services are of an administrative and business nature.

In any case, the PTCD is a major real estate development with environmental, urbanism and architectural restrictions. Its construction will primarily involve architectural techniques and civil and electrical engineering techniques. The communications, processing and storage services will use computing, network engineering and telecommunications techniques.

The technical feasibility assessment for the PTCD assumes that these technologies are relatively commonplace and that the solutions adopted are well established, and the following conclusions are drawn:

- There is no need for extremely complex buildings or the use of new materials that would be difficult to find in the Brazilian market;
- The information and communication technology services are supported by the TCP/IP architecture, which has been developed and established on the Internet, and computing services with various suppliers with a proven track record;
- The innovation features proposed for the project will raise the profile of the PTCD both in Brazil and abroad.

Because it requires only relatively commonplace technologies, as well as design, development, construction, installation, certification services, etc. for which suppliers and skilled professionals are available locally, and because the costs are consistent with local and national industry practice, it is therefore concluded that, from a technical point of view,

the PTCD is feasible. On the other hand, the technical solution put forward herein is in agreement with the summary of the economic and financial feasibility study discussed below, which demonstrates the feasibility of technology investments.

4.2 Economic Feasibility

The project's economic feasibility is assessed in terms of a positive Net Present Value. Still, the primary approach was management of the PTCD with a private partner, but this was also compared to the simple sale of the land as a mere real estate market transaction. Considering the relevance and feasibility of the partnership, the respective bidding notice for the selection of a private partner and the strategic rationale for Terracap's choices were proposed.

4.2.1 Approach for the Management of the PTCD with a Private Partner

All assumptions in this paper derive from previous reports prepared under the Terracap-UnB cooperation:

- Nominative capital cost: 18.5% per year;
- Inflation: 4.5% per year;
- Cost of debt (BNDES): 6.5% per year;
- Partnership's investment: R$1,214,710,883.65;
- Price of land paid-in by Terracap: R$1,080,000,000.00;
- Rounds of investment: four rounds of investment, which correspond to the area's environmental rearrangement:
    - Initial investment: by Terracap: R$1,080,000,000.00; and by partner: R$243,052,509.84; occupation of 17% of Lot 1's total area (17% in the aggregate);
    - Investment in the first year: By Terracap: R$0.00; and by partner: R$407,165,754.71; occupation of over 23% of Lot 1's total area (50% in the aggregate);
    - Investment in the second year: by Terracap: R$0.00; and by partner: R$273,463,637.99; occupation of over 25% of Lot 1's total area

(cumulative 75%);

- Investment in the third year: By Terracap: R$0.00; and by partner: R$291,028,981.11; occupation of over 25% of Lot 1's total area (100% in the aggregate);

- Therefore, at the beginning of the first year, 17% of the area with a commercial potential was assumed to be ready for lease; by the beginning of the second year of the project, 50%; early in the third year, 75%, and by the beginning of the fourth year, 100%. Cash flows follow this rationale;
- For the lease, a real growth of 1.5% in the price paid by tenants is assumed;
- Services related to maintenance, security, leasing of vacancies and management of vacancies are expected to have a real growth of 1% per year;
- For the electricity supply, only inflation adjustments are assumed;
- In terms of costs, expenses on maintenance and security personnel and equipment are consistent with the same real growth of 1% in revenues per year;
- Administrative personnel and other costs are expected to increase by 0.5% per year in real terms.

Based on these parameters, the estimates and the corresponding cash flow demonstrate that the PTCD is financially feasible, assuming that the business would be operated with a private partner.

Specifically, in terms of a positive Net Present Value, the estimates yielded the following results:

Scenarios **Specific Parameters**	**Scenario 1: Share of Terracap in profits as a proportion of equity capital**	**Scenario 2: Reduction of Terracap's share in profits by 50%**	**Scenario 3: Terracap's share in the profits is equal to zero**
NPV	R$ (608,086,326.38)	R$ (114,935,641.45)	R$ 378,215,043.49
PayBack	15 years	12 years	9 years
Real IRR	6,25%	8,71%	13,38%
Nominal IRR	10,75%	13,21%	17,88%
Required funding by the BNDES	27,1%	7%	0%
Cost of Real Leveraged Capital	10,75%	13,20%	14,00%
Leveraged NPV	R$	R$	R$

	652,437.95	1,858,555.11	378,215,043.49

Additionally, a comparison of the study with the exclusively real estate sale transaction of the land shows that, even if the worst-case scenarios materializes, with Terracap relinquishing its entire share in the profits for 35 years and using a cost of capital which has already been used by Terracap in its projects, participation in the business is economically preferable to simply selling Lot 1.

Concerning economic feasibility, below is the strategic rationale for the choices made by Terracap:

- Attractive profitability for the partner;
- Project controlled by Terracap;
- Change in the development dynamics in the local area;
- Financial alternative for Terracap in the future;
- Ensuring that the area is allocated for the technology park;
- This is better than simply selling the land.

4.3 Terracap's Legal and Operational Framework vis-à-vis Supervisory Agencies

4.3.1 Proposed Bidding Notice Template for the Selection of a Partner Company in the PPP

In view of the studies of various modes of partnership (other Parks, PPP for Banco do Brasil's Datacenter, PPP for Brazilian airports, etc.), an equivalent template called Design, Build Finance and Operate (DBFO) was proposed because its layout make it possible to share risks and rewards between partners. The main features of the DBFO are as follows:

- Clear and well-defined bidding process with several legal facilitators;
- Execution of a contract with a private sector contractor to design, build, operate and finance a facility for a designated period, and this facility is subsequently assigned to the public sector;
- The property is owned by the private sector during the term of the contract, and it recovers its costs through the provision of services, corporate collaboration, grant and/or consideration;
- The main factor is the use of private financing and transfer of operational risks

for design and construction.

It should be noted that DBFO's various modes of partnership involve different combinations of key responsibilities that do not conform to the PTCD. This template also makes it possible to solve several problems:

- No phase inversion with respect to determinations regarding principles of bidding processes, with a competitive bid first;
- In this case, legislative clearance for the incorporation of a state-owned company and a semi-public corporation differs from that required for them to have an interest in private companies;
- No privatization of pre-existing government corporations, but the establishment of a private company from inception;
- The options related to assignment or transfer of the property to the SPE to be created are comprehensive and correlated, and they can be used as payment of equity capital, as well as by other means, all of which are provided by law;
- In terms of the feasibility of finding a partner, in any case the public interest and equity will be upheld in case the search for a partner is not successful;
- This approach, in addition to being covered in specific legislation and having relevant doctrine about its use, contributes to the region's development on many aspects already mentioned in the feasibility study.

4.3.2 Compliance with Laws and Regulations

Maximum care in the preparation of the study and in setting the rules for the bidding process are being used with a view to complying with the current rules at both federal and local level, specifically in terms of TCDF Resolution No. 189):

- Federal Legislation:
    - Law No. 11079/2004 (PPP Act);
    - Law No. 8987/95 (Concessions Act);
    - Law No. 9074/95 (Regulates the granting of concessions);

- o Law No. 8666/93 (Procurement Act);
- Law No. 6404/76 (Corporate Law);
- Complementary Law No. 101/2000 (Fiscal Responsibility Act);
- Decree No. 5385/2005 (regulates the Steering Committee under the PPP Act);
- Decree No. 5977/2006 (regulates the enforcement of the Concessions Act vis- a- vis the PPP Act).

- Local Legislation:

  - Law No. 3.792/2006 (establishes the PPP Program in the Federal District);
  - Law No. 4167/2008 (Amends Law No. 3792/2006);
  - Decree No. 27965/2007 (endorses the Internal Regulations for the PPP Steering Board in the Federal District);
  - Decree No. 28813/2008 (declares the unenforceability of Decree No.17733/96 regarding PPPs);
  - Resolution No. 189/2008 (regulates the Control and Supervision of Bidding Procedures, Contract Award and Contract Implementation of PPPs by TCDF);
  - Decree No. 33157/2011 (provides for the political coordination of PPPs in the Federal District).

4.4 Why Take Part in the PTCD Business and Not Simply Sell the Land

Besides the relative objectivity of the technical and economic feasibility study, during the analysis work the following strategic arguments were also collected, if political, on the participation of Terracap in the PTCD business:

- Only sell the lot in a mere real estate transaction implies a tangible risk of a PTCD no longer existing in the future: in the purely real estate-related transaction, it is not possible to require the existence of a managing company for activities in a technology park, but only to allocate the land for trade or industrial activities;

- As a result, the “non-park” would be a headless or uncoordinated entity, and would have no goals that could be actually monitored or controlled by GDF;
- This scenario has happened before in the Federal District: Setor Industrial Bernardo Sayão, which deviated in relation to technology ventures, with the other properties being allocated to other types of business;
- Terracap would be missing out on an important opportunity to fulfill its mandate as a development agency for the Federal District. As transcribed in the introduction to all documents related to the Terracap-UnB cooperation:
    - Pursuant to Law No. 4586, of July 13th, 2011, Terracap also took on the role of Development Agency for the Federal District by designing, deploying and implementing economic and social development programs and projects for the Federal District, and it may also foster public-private partnerships, incorporation of special purpose companies (SPEs);
    - In view of this backdrop, Terracap plays a key role in the public policies included in programs that are being implemented by the Federal District Government, in particular with regard to the Parque Tecnológico Capital Digital [Digital Capital Technology Park] – PTCD;
- Even if the worst-case scenario in the economic feasibility study materializes, with Terracap relinquishing its entire share in the profits for 35 years and using a cost of capital which has already been used by Terracap in its projects, participation in the business is economically preferable to simply selling Lot 1 for the PTCD. This Park is a financial alternative for Terracap in the future vis-à-vis purely real estate-related transactions.

5 CONCLUSION

Through a coordinative and interdependent effort between TERRACAP's and the University of Brasilia's teams, the activities for the development of Product 5.9 were planned, discussed, implemented and documented.

The conclusion for the Product is important because it represents the actual project conclusion since it contains the summary guidelines for establishment of the PTCD. In addition, the following conclusions have been highlighted:

- The Project is technically and economically feasible;
- The approach aims to comply with TCDF's standards and enhance transparency in the planning of actions and establishment of the PTCD;
- PTCD is a financial alternative for Terracap in the future;
- The Project ensures that the area is allocated for the technology park.

Indeed, since it is the irrevocable administrator of the land, receiver and holder of any permits required for the Project, and plays the role of the Federal District's Development Agency, Terracap's participation is indispensable to ensure the Digital Capital Technology Park is successful.

The activities involved in this stage formally followed the steps in the approach listed for project management – PMP/PMI.

UnB's team believes that they had access to all information necessary for adequate performance of the work, and that the provision of such information by TERRACAP's team, as well as the joint analysis work and discussions, have helped complete the design stage.

Brasília, 30 de March de 2012.