Paper submission - Coversheet Information

Paper for the 30th IASP World Conference on Science and Technology Parks, 2013	
Title of the paper:	The CIT of Novo Hamburgo: Building a future for the capital of Brazilian footwear
Session for which the Steering Committee has provisionally selected the abstract submitted prior to this paper:	PARALLEL 2 - Factors of location in city-STP relationships
Length of the paper:	3.004 words

Author	
Given Name:	Amaia
SURNAME:	BERNARAS ITURRIOZ
Organisation:	Idom Consulting
Position:	Consultant
City:	San Sebastian
Country:	Spain
Author's e-mail address:	abernaras@idom.com
Phone (with area code):	+34 943 400 602

Co-author(s)	
Given Name:	Maria ALVAREZ, Heloisa BARBEIRO, Alina JUGANARU, Raquel PEÑA, Belén PRIMO, Oliba RUIZ
SURNAME:	
Organisation:	IDOM
Position:	
City:	San Sebastian
Country:	Spain
Co-author's e-mail address:	
Phone (with area code):	

Given Name:	Lucas
SURNAME:	CASAGRANDE
Organisation:	Prefeitura of Novo Hamburgo
Position:	
City:	
Country:	
Co-author's e-mail address:	
Phone (with area code):	

[X] I confirm my ability to present my paper in English.

The CIT of Novo Hamburgo: Building a future for the capital of Brazilian footwear

Authors
Amaia Bernaras, Maria Alvarez, Heloisa Barbeiro, Alina Juganaru, Raquel Peña, Belén Primo, Oliba Ruiz, IDOM; Lucas Casagrande, Prefeitura of Novo Hamburgo

Executive summary

Novo Hamburgo, in the state of Rio Grande do Sul (Brazil), is promoting the development of the CIT-Centro de Innovaçao e Tecnología, a technology park which is part of an ambitious local development plan supported by the Inter-American Development Bank, through the PROCIDADES program. Known as the Brazilian capital of footwear, in the last decade the city has suffered the consequences of the decline of the leather and footwear industry.

The municipality has a great interest in progressing with the Local Economic Development component of the plan, with the objective of supporting and enhancing the competitiveness of the city. Special attention has been given to the creation of the CIT to foster innovation, technology development, and the attraction of new investment.

This paper presents the Governance, Business Strategy and financing model of the CIT, together with its urban and architectural conceptual study and an environmental analysis.

1. Introduction

In 2011, the city of Novo Hamburgo (Brazil) began a process of consultation and planning, involving many different sectors of society. This concentrated effort resulted in the design of the Strategic Plan for Local Economic Development (PEDEL). The development of this process involved an extensive study which defined the vision that the citizens have of the city and the public services it offers. This process also set out to identify the priorities for development. An important phase of the work carried out involved consultation with over fifty diverse stakeholders in the society such as union representatives, intellectuals, entrepreneurs and neighborhood spokespersons.

The context in which this strategic planning was designed was one of economic recession resulting from the diminished competitiveness of the manufacturing cornerstone of the city. Historically, Novo Hamburgo had been to manufacturing center of the leather and later footwear made from manmade products. Income came from export on an extensive scale; however, towards the end of the last century the scenario changed. Increased globalization saw the appearance of players such as China and India and eventually the city was reduced to supplying the protected domestic market of Brazil. In an effort to increase competitiveness, the local footwear moved away to Central America and the cheaper labour regions of Northeast Brazil.

It is important to note that since the turn of the century Brazil has experienced substantial economic growth. However, this growth has not been the same for all regions. As such the progressive thinking of the city has led the municipality to look for solutions. With the support of the InterAmerican Development Bank and the Fondo General de España in the form of funding for technical studies, the city has begun its search for solutions to the economic questions being faced by its citizens. This concentrated coordinated effort has given rise to the PEDEL initiative.

PEDEL

Work on the development of PEDEL commenced in 2011 with the circulation of a self-administering

survey containing 60 questions, 18 Likert-5 scale questions, 12 questions using metric scale, 8 questions for a proper identification of the respondent profile and 2 questions with open fields. In order to reach all citizens, 60,000 questionnaires were distributed by the municipality, through the provision of the questionnaire in public buildings (clinics, hospitals, schools, telecentres, and other municipal services) and by attaching the questionnaire in the three newspapers with the largest circulation in the city. In addition, the questionnaire was also made available on internet.

The sample population was of 1,748 respondents, which corresponds to 0.73% of the population of 239,051 inhabitants. In the case of the random sample, we registered a level of error of 2.34% with a confidence level of 95%. The general profile was: 60.2% female and 39.8% male. This demonstrates greater female participation, which was to be expected given that 51.6% of the universe (the city's population) is female. In respect to the age groups, 54.5% of respondents were between 21 to 40 years, while over 20.4% corresponded to the 41 to 50 age group. All in all, this meant that the total of respondents between the ages of 21 to 50 amounted to 74.9% of the demographics. In relation to education, 81% of respondents had not completed higher education; however 20.7% were currently is in third level education. Finally, 73% of the sample received a monthly household income of less than R $ 2,665.00[1]. Thus we can characterize the sample as predominantly female adults of working age with low or medium level education and income.

With respect to the sections treated in the survey, the most important in terms of strategic planning was the third section. Respondents were asked to express their level of agreement with a selection of proposed investments using a rating system of 1 to 5. The following table presents these proposals as well as the findings of this section of the survey.

Descriptive Statistics

	No	Mean	Std. Deviation
1. Investing in sanitation and sewage treatment.	1641	4.70	.735
2. Investing in professional education.	1633	4.69	.743
3. Support micro and small enterprises.	1644	4.69	.714
4. Boosting cooperation between companies, universities and education centers of technology.	1594	4.48	.910
5. Invest in affordable housing.	1643	4.46	.918
6. Invest in the modernization of public transport.	1623	4.38	1.038
7.Investing in companies innovative industries and high technology.	1571	4.33	1.059
8. Invest in expanding the supply of culture and leisure.	1608	4.32	1.000
9. Invest in strengthening Novo Hamburgo as National Capital of Footwear.	1622	4.13	1.206
10. Promote greater cooperation between Novo Hamburgo and neighboring municipalities.	1595	4.02	1.088
11. Investing in tourism development.	1587	3.90	1.197
12. Create a new shoe fair in FENAC[2].	1575	3.66	1.373
Valid N (listwise)	1339		

The results showed that the respondents valued investment in technology (fourth and seventh place in the above table) above investment in the traditional footwear activity areas of the city (ninth and twelfth position). These findings are significant considering the general profile of the respondents, low and middle income females with little access to higher education.

Once in possession of the data regarding the opinions of the general population, work began on the development of the second phase of PEDEL. Meetings were organized with the participation of the city leaders (union representatives, businessmen, politicians, intellectuals and opinion makers). In all, four meetings were held, three in person and one via the internet using DELPHI methodology. The major strategic issue consensually agreed among the participants was the economic problem that the city was facing. As a result of this consultation process, the participants reached the conclusion that the proposed solution for strategic planning would be twofold: investment in tourism, business and trade, and investment in innovative enterprises and the technology base,

[1] In May, 3, 2013, R$1 = US$ 0.50

[2] FENAC is a large trade fair, with more than 29.000m ² of air-conditioned environment located in New Hamburg. Currently its main trade fairs are in the area of machinery.

taking an approach which involved the universities.

With the demand clearly identified and defined involving the participation of local leaders, the universities, politicians and opinion makers; the idea arose of concentrating this effort in a singular area with the aim of generating a critical mass, attracting and encouraging the development of new companies. This idea was later called the “Center for Innovation and Technology” (CIT).

2. Location and physical development

“Knowledge Cities”

Knowledge Cities are not the topic of the moment; they are a reality which has led to the creation of knowledge society cities much like the industrial societies that have resulted from the industrialization of other cities.

The scientific and technological revolution is a global phenomenon which creates new opportunities and challenges for all countries. For this reason Scientific and Technology Parks are in constant evolution all over the world, and are now the new infrastructure where knowledge and technology are concentrated. The question is now how to best plan these spaces to meet all the requirements of the existing and new creation technology firms.

The urban design of technological parks should include specific aspects of innovation and technology, in order to ensure that the park area is a place of excellence. This dynamic is normally associated with the idea of a closed campus, which concentrates all the main services and facilities in order to promote a space for the exchange and sharing of knowledge. However, as in many other cases of technological parks in Brazil, this type of closed technological park does not allow for a direct link between the park and the city. Thus, the concept of urban design proposed for the CIT introduces innovation into the concept of physical and urban planning, opening the park to the city and its citizens as well as building a new framework of urban quality.

“Strategy for urban integration”

The main objective of the master plan project of CIT is the integration of the technological park with the existing city and its proposed urban expansion (the new planned urbanization of Boulevard Germânia has already been approved by city hall). This urban expansion area, where the CIT is located, is one of the last available areas in the proximity of the city centre and will be one of its newest urban amenities. The implementation of the CIT will hopefully attract new private investment to the surrounding areas, and as such will require the provision of public infrastructure; a good public transportation network, which will serve not just the technology park, but also its neighbours while connecting the area to the historical city centre.

The urban proposal for the Novo Hamburgo goes beyond the creation of a technological and innovation park; they aim to contribute to the promotion of knowledge and innovation themselves, through the creation of open urban spaces designed and finished to the highest standard, contributing to the development of the city not just at district level, but also at municipal level. The term, "innovation habitat" is a concept which is being used more and more by Brazilian academic authors, and is In fact being applied to the development of the CIT, striving to generate positive externalities in the urban environment.

The three key issues that have been identified and are considered to be very important to the development of this proposal for a technological and innovative urban space are the following:

1) CIT open to the city
2) A mixed use space and a meeting point
3) CIT as a new green infrastructure contributing to the environment

These key issues have become the criteria that will determine the form, structure and activity of the Centre for Innovation and its urban surroundings, the promotion of living spaces for the encounter of scientists, workers and citizens, a platform for innovation.

“CIT open to the city”

In order to achieve a safe and innovative environment, several criteria of the CPTED (Crime Prevention Through Environmental Design) method, that are of special relevance to the design of safe public spaces and sustainable communities, have been considered.

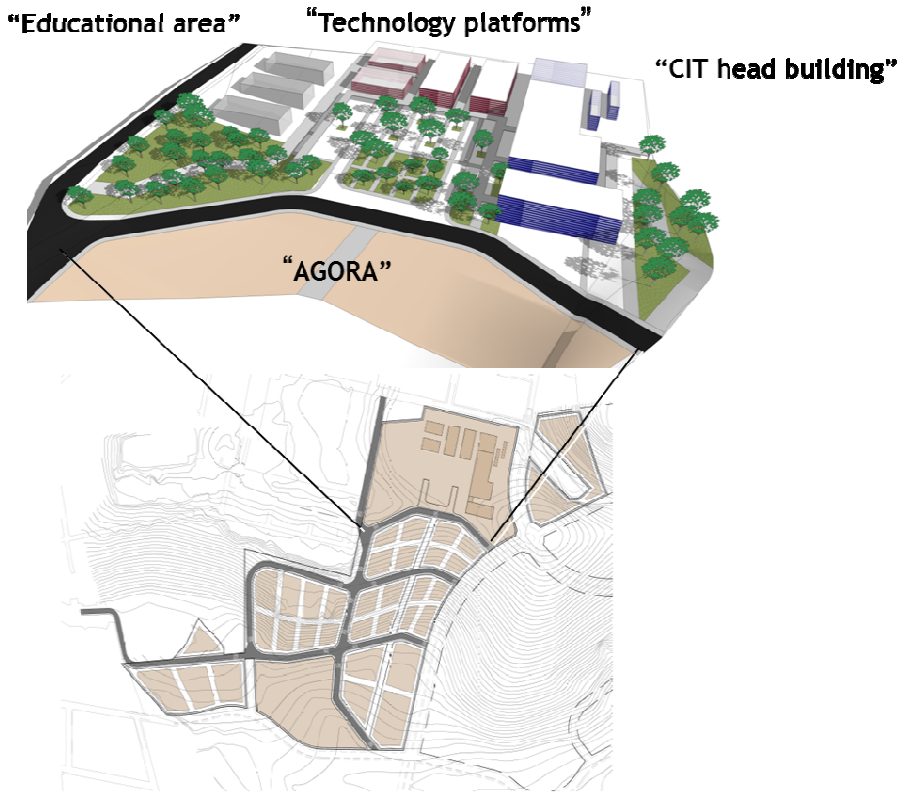
- **Access and mobility**: places with well-defined routes, spaces and entrances that allow for convenient mobility without compromising security. A good mobility framework has direct routes that lead to where people want to go by whatever means, including walking, cycling or public transport. Routes for pedestrians, cyclists and vehicles should, in most cases, run alongside one another, and not be segregated. Where footpaths are required, they should be as straight as possible and wide, avoiding potential hiding places. They should also be overlooked by surrounding buildings.
- **Activity**: Busy public spaces and places where the level of human activity is appropriate to the location and creates a sense of safety at all times.
- **Ownership**: places that promote a sense of ownership, respect, territorial responsibility and Community.
- **Physical protection**: places that include necessary, well-designed security features.
- **Management and maintenance**: places that are designed so that management and maintenance are as simple as possible.

“Mixed-use space and meeting point”: ÁGORA

The master plan introduces a complexity of functions in the use of land in the newly built areas, in order to avoid functional specialization. The premise of the master plan is to create a mix-use plot which allocates research laboratories, higher education institutions and the main CIT building, or headquarters which will be the nerve centre of the technology park.

This plot is located in a prime location, the highest point in the area, with spectacular views of the city. As well as offering an attractive physical environment, CIT-NH will promote human activity. Building on the positive effect of a pleasant and dependable climate, the design for “AGORA” has embraced the new concept of creating a singular ‘people climate’, a meeting point for knowledge workers, students and citizens.

- “Educational area”
- “Technology platforms”
- “CIT Main Building”: A hybrid building, which meets the priority needs of the project (research laboratories, business center, auditorium, incubator providing support to start-ups, classrooms and training facilities, executive management offices, technology transfer office…)



"The CIT as urban life quality"

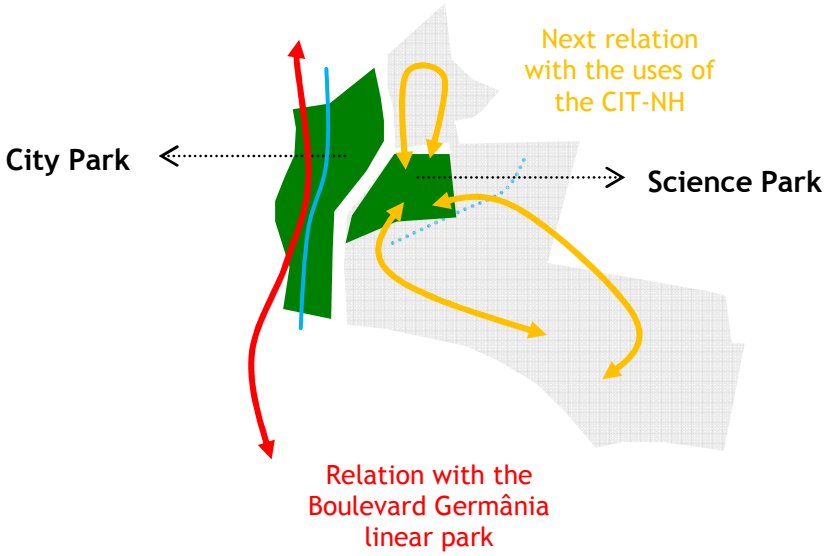
The preservation of 20 % of the totality of the plot for green spaces is planned in the CIT. The World Health Organization considers the surface of cities in use as green spaces, to be an indicator of quality of urban life. Public green spaces are one of the main promoters of social life. These are places for meeting, sharing and integration; they promote cultural and generational diversity of a society, and generate symbolic value, identity and belonging. The CIT wants to prioritize this idea by enhancing the existing natural preservation areas protected under Brazilian law, and take the opportunity to give life to a preservation space.

Thus, the urban proposal for the CIT has considered these concepts, allowing for a diversity of land uses within the same technological space, promoting new areas of work and scientific production in qualified green spaces. This dynamic process will allow for and increase contact between scientific workers (often restricted to the universe of a research lab or work facility) with other citizens, who will also be using the same green area for other activities. Therefore, technology transfer will break the boundaries of formal transfer, increasing the opportunity for the interest in science and technology to be increased for all users of the designated green areas of the park; in essence this green space will create a meeting place between CIT and the city of Novo Hamburgo.

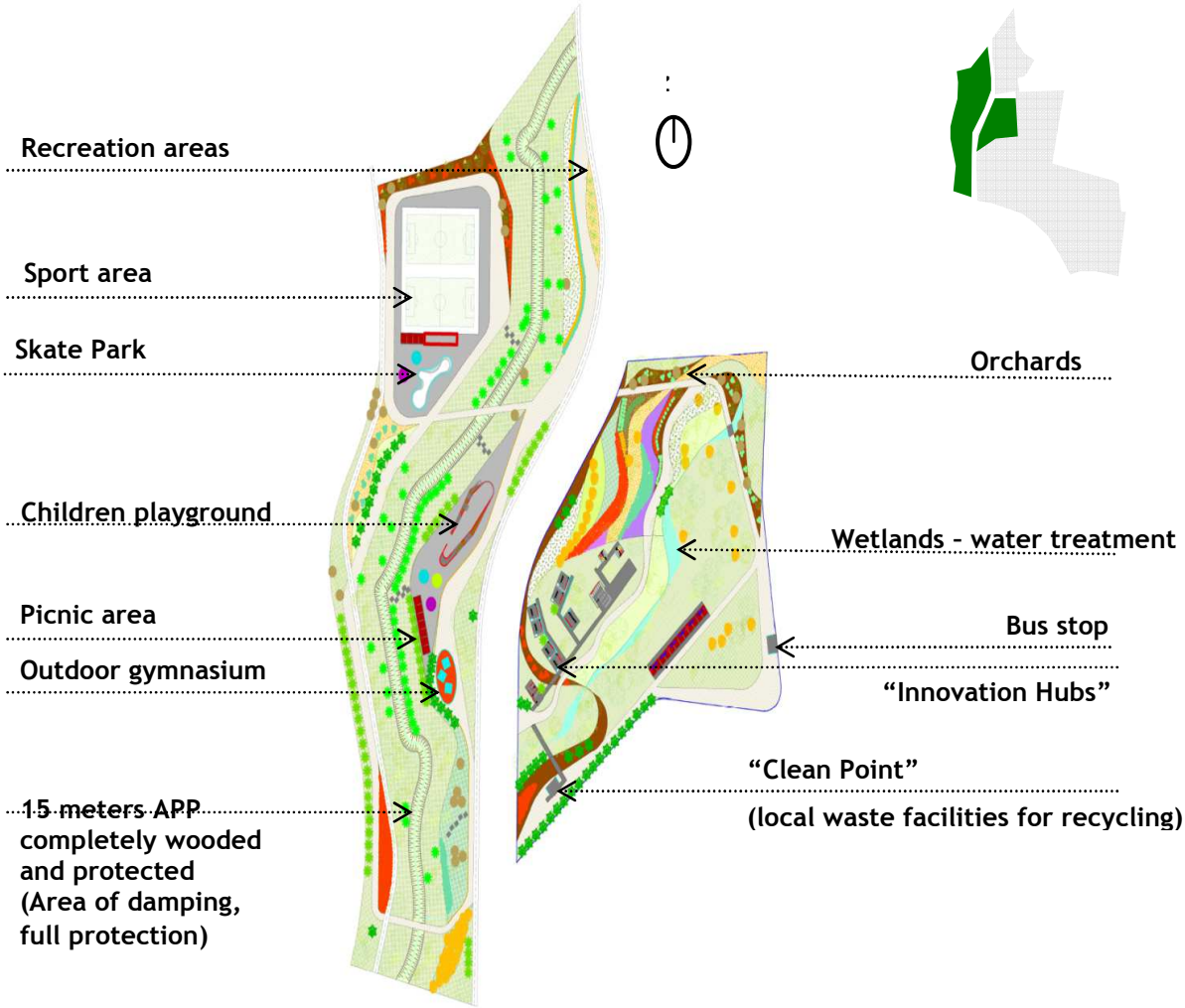
Indicator of urban life quality: According to international organizations such as UNESCO, IUCN and the European Council, public green spaces should give quality to the city. With this in mind, it is necessary to consider where and how to act to reverse the degradation processes, and to promote the creation of new spaces that meet the new demands of the population, while also considering the level of compatibility with more business-type uses.
Under these premises, the CIT concept proposes the coexistence of uses that a prior, appear to be purely related to town-planning, but is in fact, the integration these uses to an ecological model where a natural corridor is formed by the Gauchinho stream.

Green area and Innovation: The CIT is taking full advantage of this opportunity to develop an area of innovation by mixing scientific and technological uses with the social and environmental requirements of a city such as Novo Hamburgo. As such this park must be many things to many people, primarily *a city park and a science park*.

Relation with consolidated quarter



Design of the green space:
The European Territorial Strategy raises the question of the "creative management of the cultural landscapes" (Potsdam, 1999), and states that the design of any public green space must relate to it before the promotion of the social practices, so that a space that does not offer value (use, contemplation, or environmental contribution) will be a poor, devoid, helpless space. In order to achieve a successful landscape proposal for Novo Hamburg CIT, the inclusion of a great variety of activities for all the social groups will be considered (recreation and sport areas, modules compatible with different uses, educational spaces …), ensuring that the green space adds value.

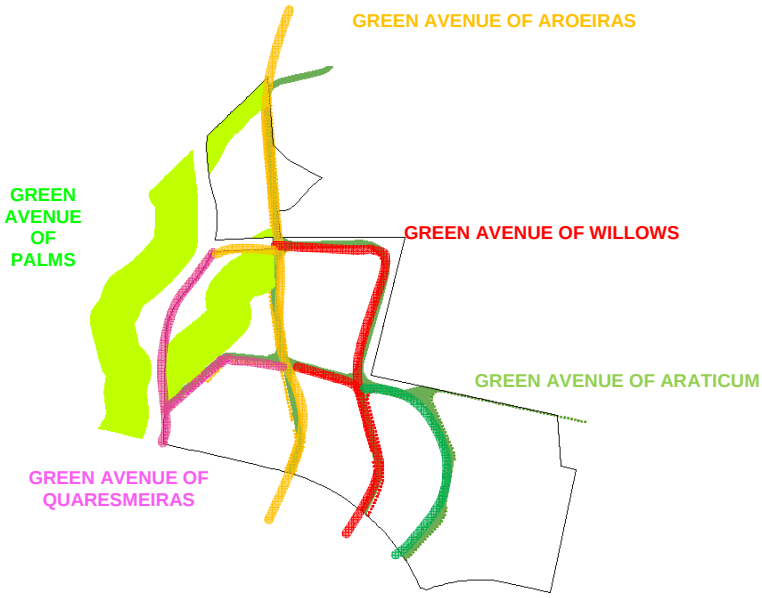


The importance of the woodland planning

Woodland is an intrinsic element of an urban green space, although it is normally associated with public green spaces. In the city, there are already numerous public spaces with a wooded element: ridges, roads, boulevards, squares. In particular, the linear woodland can be considered as an urban service, organized in the form of an urban network. Native species that adapt to the territory also give it identity; an aspect which has been considered in the Novo Hamburgo CIT.

The urban network proposal of the master plan has taken into account the extensive voids and existing topography, trying to minimize the impact on the environment. For this reason, large boulevards with native species have been proposed, providing shadow for pedestrians, cyclists and reducing the level of solar radiation for buildings.

The proposal to achieve an open technology park, will also simplify the integration with the existing and future urban grid, reducing the need to replicate urban facilities and amenities, thereby lowering the costs or urban development. The proposed interior urban grid will also promote a mix of transport modes, with a planned network of cycle and pedestrian paths, simplifying the connections between buildings and open areas.



3. Governance

The definition of the Novo Hamburgo CIT includes the design of the governance structure that will be adopted by the new entity to ensure the correct governance of the park at strategic and operational levels. The governance of the park was designed in a collaborative process involving the setting up of a working group made up of representatives of private and public entities that had shown interest in the project. CIT has been conceived as a Public-Private Partnership initiative to act as a catalyst to attract investment in innovative and technology-based enterprises. Given that this initiative is the result of a process of consultation and planning which commenced in 2011, the full support of local stakeholders is guaranteed.

The governance structure proposed for the CIT is envisioned following the Triple Helix model. The Triple Helix model, as conceived by Henry Etzkowitz and further developed with the collaboration

of Loet Leydesdorff[3], entails the interaction between university-industry-government as a key element to knowledge-based development. According to the system theory[4], the Triple Helix systems that emerge from the interaction of the three spheres is conceived as a set of: (i) **components** (the institutional spheres of University, Industry and Government, with a wide array of actors); (ii) **relationship between components** (collaboration and conflict moderation, collaborative leadership, substitution and networking); and (iii) **functions**, described as processes taking place in what is labelled as the "Knowledge, Innovation and Consensus Spaces".

The **components** of the CIT governance structure are the institutional representatives of the entities that have shown a firm interest in the project at this stage; however, the structure is envisaged as a flexible one where more entities can join. The collaborative approach seeks to define the **relationship between the components** and to contribute to the overall objective of creating an entrepreneurial locus where the needs are met and solutions are offered to benefit local and regional agents. The CIT aims to bridge the gap between the training demand of the industrial sector and the academic and vocational training offer, through the communication of needs and the shaping of the curricula of training and education centres to satisfy the demand of industry and the university graduate. Special emphasis will be placed on the development of entrepreneurial talent and applied research oriented to new graduates.

The location of the federal level research institute working in the area of footwear within the CIT will contribute to the creation of a **knowledge space** through the relocation of research sources, bringing them closer to the client companies located in the same geographical space. Pursuing the objective of becoming a driving force of change within the region, the CIT will include an **innovation space,** created by building an integrated environment for technology transfer and entrepreneurship activities; the Technology Transfer Office (TTO). The TTO´s will link the work being carried out by the universities in basic and applied research to the market, via technology transfer and commercialization mechanisms.

Decision-making in the governance structure is envisaged as a flexible environment where simple majority and qualified majority are the norm, thereby ensuring a **consensus space** rather than imposing fixed decision-making by unanimous vote. This flexible consensus space will allow for *exchange in the leadership of the initiatives presented in the forum*. While initially this is a government supported initiative, this flexible approach means the management and strategic orientation is open to being led by other private or public entities participating in the CIT.

It has been commonly agreed among the representatives of the interested parties (the Municipality, private and public education and research institutions, business associations and private companies) that the creation of an **autonomous entity** is what is demanded for the management of CIT Technology Park. On analysis of the latest studies on the most appropriate legal form for private entities managing technology parks in Brazil[5], it was proposed and agreed that the new development would be created under the legal form of a **non-for-profit association governed by private law**. In addition, the new entity will seek to obtain the "Social Organization" qualification The project will also seek to obtain the "Social Organization" qualification, which along with its non-for-profit status is in line with the accepted formula for the management of technology parks in Brazil[6]. The Social Organization qualification is to be requested *a posteriori* and will allow for Management Contracts between the technology park managing private entity and the Public Sphere that will permit easier access to public funding.

The functional structure of the future non-for-profit association that will manage the CIT is structured in five levels; with the first four levels representing the governance of the technology

---

[3] Etzkowitz, H., Leydesdorff, L. (Eds.) 1997. Universities and the Global Knowledge Economy: A Triple Helix of University-Industry-Government Relations. Cassell Academic, London.

[4] Carlsoon, B., Stankiewicz, R. 1991. On the nature, function, and composition of technological systems, *Journal of Evolutionary Economics* 1, 93-118 in Ranga, M., Etzkowitz, H. 2012. The Triple Helix Systems: An Analytical Framework for Innovation Policy and Practice in the Knowledge Society, Research Policy (under review).

[5] IEA (Instituto de Estudos Avançados da Universidade de São Paulo), Parques Tecnológicos: Ambientes de Inovação, Steiner, J., Cassim, M., Robazzi, A, text available at: www.iea.usp.br/artigos

[6] Pessôa, L., Cirani, C., Silva, M., Rangel, A., Parques Tecnológicos Brasileiros: Uma análise comparativa de modelos de gestão, *Revista de Administração e Inovação*, São Paulo, v.9, 2, 250-270, April/June 2012.

park and the latter having an operational function.

The first level, the **maximum deliberative level**, gathers all the types of associates under the umbrella of the General Assembly, whose role is to approve or dismiss the proposals and results of the management of the strategic level. Participation in the governance of the CIT allows for different degrees of implication by foreseeing three types of associates: **full members** (the signatories of the Constitutive Act), **cooperative members** (entities with an interest in participating actively in the implementation of the CIT, without contributing with financial resources) and **honorific members** (prominent personalities or entities in the area of research and technology innovation, that will have an advisory role).

The second level, **the strategic level**, constitutes the Administrative Council; that is the main debate forum that sets the strategic direction of the CIT. Full members will participate in the decision-making process in proportion to their financial contribution. A quota of participation will also be distributed between cooperative and honorary members.

The third level, the **advisory and control level**, is made up of the Technical and Dissemination Council and the Fiscal Council. The Fiscal Council is responsible for the economic and financial management of the CIT. The achievement of clear objective of the CIT of the promotion of innovation at all levels of the society demanded a distinct and specific body within the functional structure. The Technical and Dissemination Council will be responsible for the spread of innovation culture at all levels, and will aim to bring about societal change with innovation being part of the day-to-day life of society. The overall objective of the CIT is to elude *the ivory tower chimera* and promote an open technology park for and built by the society of Novo Hamburgo.
The introduction of the Technical and Dissemination Council in the governance functional structure will enhance the core model of the Triple Helix by adding a fourth helix which will in itself be twofold, involving "media-based and culture-based public" as well as the "civil society"[7]. This fourth helix means that a broader understanding of knowledge generation and innovation application will be required for society to be more integrated into advanced innovation systems[8].

The fourth level, the **executive level**, includes the Managing Director of CIT together with the Technical and Operational Manager and a Manger of Planning and Management.

The three positions will be responsible for the daily affairs of the technology park and the implementation of the strategic orientation given by the Administrative Council and approved by the General Assembly.

The fifth and final level, the **operational level**, will bring together the Technology Transfer Office (TTO) and the Infrastructure Management Unit. The TTO will offer services related to IPR protection, technology watch and competitive intelligence together with advisory services oriented to product definition, design, branding and marketing. Meanwhile, the Infrastructure Management Unit will supervise the installation and growth of the CIT through the various implementation stages according to the criteria established at the executive level.

All in all, the proposed governance model aims to create a flexible structure, which will adapt to knowledge-intensive development, while having a clear vocation to serve society and be a driving force for the penetration of innovation in Novo Hamburgo in all spheres.

4. Specialization areas in the CIT of Novo Hamburgo

Currently, Rio Grande do Sul is the third most important region in terms of generation of wind energy. The state expects to invest 4.8 billion R$ in new wind plants between 2011 and 2016. Rio Grande do Sul benefits from good natural conditions for the development of wind energy. In fact, the state currently boasts ten wind parks which is expected to increase to 54 by 2016. According to

---

[7] Carayannis, Elias G., David F.J. Campbell, 2009. "Mode 3" and "Quadriple Helix": Toward a 21st Century Fractal Innovation Ecosystem. *International Journal of Technology Management* 46 (3/4), 201 – 234.

[8] Carayannis, Elias G., David F.J. Campbell, 2012. Mode 3 Knowledge Production in Quadruple Helix Innovation Systems. Twenty-first-Century Democracy, Innovation, and Entrepreneurship for Development. *SpringerBriefs in Business7*, 1 -64.

the sectorial agenda[9], the state government will make substantial investment in wind energy generation, building plants and manufacturing machinery and components for the related industries. Novo Hamburgo is located between two areas with high potential for the wind energy: the Gaucha mountain range and the coast along the Lagoa dos Patos (Lake of Ducks). It is expected the production network for components such as controllers or transformers will increase, bringing with it new opportunities for service providers, logistics, maintenance and assembly.

Additionally, Rio Grande do Sul is a leading region in the Brazilian sector of biofuels[10], and the country is the second largest producer of ethanol fuel in the world. Although at present, there are no biofuel plants operating in Novo Hamburgo, some related activities (biodiesel, plastic, beverages, pharmaceutical industry and perfumes) could be developed within the area of influence of the CIT.

Other industries that are growing in the state of Rio Grande do Sul include electronics, automation and telecommunications[11]. These are important industries, and concentrated along the Porto Alegre-Novo Hamburgo axis (accounting for 67% of all the companies in the state) and in Caxias do Sul (16% of the companies in the state). In Rio Grande do Sul, it is estimated that there is a total of 83 automation companies, which accounts for 46% of the total industry in Brazil. In fact, an "Arranjo Produtivo Local" (Brazilian concentration of companies, similar to the cluster concept) is established in Porto Alegre and Caxis do Sul, with Novo Hamburgo being located in the middle.

Novo Hamburgo is known as the city of footwear. In recent decades, most of its economy has been based on the manufacture of footwear, bags, and other leather products. According to the analysis included in the PEDEL, in 2008, the manufacture of footwear and leather products accounted for 18.8% of the Gross Value Added (GVA) of the municipality, 49% of the employed population, and 57% of exports in 2009[12]. Most of its workforce is very skilled and trained in the design and manufacture of leather products. In fact, the strategy adopted by Brazil to increase competitiveness in the footwear industry against China is based on developing new high quality materials that are respectful to the environment, such as biodegradable soles, etc. The Brazilian Institute of Technology in Shoes (IBTEC), located in Novo Hamburgo, is actively developing new materials to help the "Made in Brazil" brand compete with the cheaper products coming from countries with lower labour costs.

When defining the sectors in which the CIT should focus, it was noted that all the knowledge gained from a traditional sector with low levels of R&D and the networks already in use (associations, institutes, etc. related to footwear) could leverage the development of an emerging sector intensive in R&D, such as the materials sector. This new sector will include all the companies in the region that manufacture materials, such as rubber, chemical paintings, plastics, etc.

In order to ensure complementarity with other parks in the area of influence of the CIT, the specialization areas and the existing companies established in them were analyzed and it was concluded that the specialization areas of the CIT were complementary to those in the other technology parks nearby.

Finally, both parks have been very focused on the IT sector; however, the CIT will still work on the attraction of this sector, considering that there is margin for the development of other related industries, and the number of IT companies is sufficiently important to meet the current offer.

In conclusion, the CIT, based on the expectations for future development and investment and considering the current offer in the proximity will focus on four sectors: IT (software), renewable energy and sustainability, automation and materials.

Traditionally, science and technology parks have relied on anchor companies that have helped the initial development of the park, by attracting smaller companies that value physical proximity to the leading companies in their industry or related industries.

---

[9] Programa Sectorial Energía Eólica RS 2012-2014

[10] Programa Sectorial Biocombustibles, Bioetanol y Biodiesel RS 2012-2014

[11] ABINEE, Programa Sectorial de Electrónica, Automatización y Telecomunicaciones de RS 2012-2014

[12] PEDEL Novo Hamburgo. Diagnostico

This approach was adopted by the nearby Tecnosinos Park, whose main success was the attraction of the giant semiconductors company HT Mikron and SAP. Currently, when technology parks are emerging and in the case of some consolidated parks, it is difficult to attract companies by merely providing high quality services, given that there are already many parks providing top quality services. In this context, other incentives are needed to attract large multinationals. This is the case of fiscal incentives, which has been the main reason for the establishment of large IT multinationals in the state of Rio Grande do Sul. In fact, according to the Instituto Brasileiro de Geografia e Estatística (IBGE)[13], in 2009 more than half of the cities and towns in Rio Grande do Sul had some type of mechanism in place to attract new businesses.

Some of the most common incentives include the donation or the transfer of plots of land[14], followed by the total or partial exemption of the Tax on Property and Urban Land (IPTU) and the Municipal Tax on Services (ISS). The CIT of Novo Hamburgo and the city council will analyze the different fiscal incentive policies and decide on the most appropriate local mechanisms to be put in place.

5. Economic Model

The studies developed for the CIT Novo Hamburgo include an economic feasibility study that has been based on the governance analysis as described above, and the location and physical development studies as well as the business plan. The business plan includes an investment plan that outlines the adequate funding strategy and a feasibility study for the operation of the Park.

As has occurred in the majority of Technology Parks, the development of CIT Novo Hamburgo will be phased, which will also allow it to react to the current market environment, while considering financial and technical criteria. Phase I will involve a "trigger plot" to initiate the activity of company attraction. Phase II will involve the provision of space for future expansion. To provide the client with maximum flexibility in view of the current economic crisis the trigger plot itself will also be developed in several phases (construction, growth, consolidation).

In relation to financing, the CIT will obtain funds from the owner associations and support from national and regional stakeholders. This is common practice and will facilitate the purchase of the land, the urbanization of the plots, the design and construction of office/factory space and the provision of ancillary services and utility infrastructure.

In the case that the land is donated by a member of the owner association, a management entity will be created for the initial urbanization works, the development of the outer areas of the site and ultimately the operation of the park. The inner structure of the Park will be left for investor companies to develop who will build their own buildings in accordance with the design criteria provided.

The buildings that will be constructed in the first phase, including the headquarter building; will host the anchor investors and the management entity. It is important that the initial construction works include the headquarter building in order to attract investors and enable knowledge transfer and spillover and by providing the necessary shared space. A space for research centres (private and university owned) is also contemplated as well as enterprise incubators. This facility will accommodate start-up or new creation enterprises with limited capital, and will consider an incentive package including government-subsidised rent.

At a later stage the buildings for the ancillary services will be provided. These will be rented out and will accommodate services such as real estate agents and banking, as well as leisure facilities.

With respect to property management, the Park will be operated according to the "condominium model" which requires the owners/tenants to pay a service charge for the maintenance, security and external repairs, in relation to the proportion of the land they own/rent. This model, which is common practice in Latin America, and in particular in Brazil, has the advantage of simplifying the

---

[13] Perfil dos Municipios Brasileiros, IBGE, 2009. Access: 17/05/2013

[14] Os incentivos fiscais nos municípios da região sul, Alfredo Meneghetti Neto

management of the park, as well as the added benefit that the community members' contribution to maintenance costs is fairly divided.

Finally, with regards to financial sustainability, the financial model and operation plan proposed for the Park will generate a positive cash flow from the third year of operation. It is also expected that the revenues from the sale of the plots and the rent of space will cover the initial outlay and the operating costs.

6. Conclusions

In conclusion this paper has set out to present the proposed Governance, Business Strategy and Financing Model for the Center for Innovation and Technology (CIT) of Novo Hamburgo, as well as the results of the urban and architectural conceptual study and the environmental analysis carried out. CIT has been conceived as a Public-Private Partnership initiative to act as a catalyst to attract investment in innovative and technology-based enterprises. Given that this initiative is the result of a process of consultation and planning which commenced in 2011, the full support of local stakeholders is guaranteed.

The legal form that has been proposed for the CIT is that of a non-for-profit association governed by private law. The project will also seek to obtain the "Social Organization" qualification, which along with its non-for-profit status is in line with the accepted formula for the management of technology parks in Brazil[15]. Activity will focus on four sectors: IT (software), renewable energy and sustainability, automation and materials. The CIT and the city council will analyze the different fiscal incentive policies available and decide on the most appropriate to be put in place to ensure the success of the initiative.

The three key issues that have been identified as of great relevance during the development of this proposal for a technological and innovative urban space are the following:

1. CIT open to the city
2. A mixed use space and a meeting point
3. CIT as a new green infrastructure contributing to the environment

These key issues have become the criteria that will determine the form, structure and activity of the Center for Innovation and its urban surroundings, the promotion of living spaces for the encounter of scientists, workers and citizens, a platform for innovation.

Also, it is planned that 20 % of the total area will be preserved for green space. In terms of financing, the CIT will obtain funds from the owner's association and support from national and regional stakeholders. This reflects common practice and it will facilitate the purchase of the land, the urbanization of the plots, the design and construction of office/factory space and the provision of ancillary services and utility infrastructure. In terms of property management the Park will be operated according to the "condominium model". Finally, with regards to financial sustainability, with the financial setup and modus operandi proposed the Park will generate a positive cash flow from the third year of operation. It is further expected that the revenues from the sale of the plots and the rent of space will cover the initial outlay and the operating costs.

[15] Pessôa, L., Cirani, C., Silva, M., Rangel, A., Parques Tecnológicos Brasileiros: Uma análise comparativa de modelos de gestão, *Revista de Administração e Inovação*, São Paulo, v.9, 2, 250-270, April/June 2012.