

Gateway : **Regions as innovative hubs ?**

Author : Christine LIEFOOGHE

Maître de conférences (senior lecturer)

Laboratoire TVES (Territoires, Villes, Environnement, Société)

UFR de géographie et aménagement, Université de Lille 1,

Avenue Paul Langevin, Cité scientifique, 59655 Villeneuve d'Ascq cedex

Mail : christine.liefooghe@univ-lille1.fr

Tel : + 33 (0)6 83 70 05 84

Title : **Regional Innovation Policies versus Innovative Urban Projects in a former industrial Region : an evolutionary perspective**

Abstract:

At the beginning of the economic globalization, the challenge for traditional industrial regions was innovation in production processes and products. At a national and regional level, innovation policies were based on a sectorial approach, then on spatial programmes as technopoles and science parks. More recently national and regional innovation policies tend to foster the networking and the clustering of firms and public research, to reach at the excellence in production in a competing world. At a local level, urban planning programmes offer different specialized innovation parks considering that proximity is a tool for cluster emergence and development. So Regional Innovation System may combine networking policies and urban planning. In an evolutionary approach of the RIS the economic and geographical context is important but political decisions at a local, regional or national level play the role of lock-in and lead to increasing returns for change. But in an increasingly global and competitive information economy the networking of stakeholders is more and more complex. The risk is that the weak economic growth and the inertia of the local economic system continue to maintain negative lock-in processes and the historical lack of interactions between the stakeholders.

Key words: regional innovation systems, urban planning, evolutionary theory, systemic approach, industrial region

1 - INTRODUCTION: EVOLUTIONARY ECONOMICS AND URBAN PLANNING

In a globalizing world the competitive advantage of nations, or larger spaces as Europe, more and more depends on the regions to become Regional Innovation Systems (RIS) interlinked with other regions. But in a competing world technological innovations are not any more the unique solution to be competitive because the emergent countries as China or India have the knowledge and competences to innovate. The challenge is to innovate quicker than the other (enterprise, region, nation), and to construct an advantage by differentiating the production system and products. But the competition is unequal because some regions (to keep just that level) begin the race with a lot of advantages such as agglomeration economies or a real RIS, when other regions such as old industrial ones or peripheral ones have handicaps as a mature industrial sector, the lack of knowledge infrastructure or the financial and decisional dependency to the core regions. The idea is to foster innovation in regions not only with policies helping enterprises to be more innovative but also and above all creating linkages between enterprises (SMEs and big firms) and with public research centres and universities. More recently the Triple Helix approach underscores the importance of a third dimension, the role of government to stimulate interactions between industry and universities in the context of a developing knowledge economy. So “the regional innovation system can be thought as the institutional infrastructure supporting innovation within the production

structure of a region”, with interaction networks between and inside two subsystems, the regional production structure (knowledge exploitation subsystem) on the one hand and the regional supportive infrastructure (knowledge generation subsystem) on the other hand (Cooke and Asheim, 2006, p. 79). But the two subsystems (and the fact that they are or not systems) are dependent of the historical trajectory of each region (Boschma and Lambooy, 1999). The time dimension is fundamental in the evolutionary approach of spatial systems such as regions, even if the regional development also depends on chance and small events, selection and lock-in processes, path dependency and increasing returns. In the perspective of a constructing regional advantage, the building of social capital (shared norms and values) is the way to facilitate coordination and cooperation between individuals, firms and other institutions, when innovation is not any more a question of Research and Development inside a firm but is based on interactive learning between firms, universities and government. That conceptual scheme is attractive and some examples of successful innovation policies (in Finland) or evolutionary development process (Grenoble) are described in the European commission report (Cooke and Asheim, 2006, p. 43). But how useful can be the evolutionary approach in a constructing regional advantage perspective in an old industrial region where the evolutionary development process is not achieved? What “degrees of freedom regional policy makers may have to determine the future development” of an old industrial region in an evolutionary world where competitiveness is a challenge for metropolitan regions (Boschma and Lambooy, 1999, p. 427)?

In 2006 french geographers tended to analyse the results of a more than twenty years old innovation policy which considered that technopoles were able to develop innovative networks between firms and with the universities. In the Nord-Pas-de-Calais region (north of France) an interdisciplinary research team (geography, history, architecture), was asked to study the evolution of Villeneuve d’Ascq Technopole localised in the Lille metropolitan area (Liefoghe et al., 2006). According to the research object (the technopole) the urban planning approach was dominant: Villeneuve d’Ascq is also a new town planned in the sixties in order to control the urban sprawl of Lille, Roubaix and Tourcoing, an industrial conurbation. But the concept of technopole, locally adopted in the eighties, also deals with an economic dimension. As some previous studies showed that the interactions between firms and the University of sciences and technologies were very weak, we decided to adopt an historical approach in order to understand the origins of the technopole and the role of private and public actors to implement that sort of innovation policy in Lille. We discovered that nearly each actor had his own story and we had to confront the points of view in order to separate the myth from the (a?) reality. The second difficulty was about the scale of the research. The Villeneuve d’Ascq Technopole seems to be a localised urban project but it is also a question of regional innovation policy because that place was chosen to produce innovations that should have been exploited by the regional productive system. Moreover, new urban programmes were launched in the nineties in order to disseminate science and/or technology parks in the metropolitan area. Concerning the networking of actors, it was also evident that the previous project of technopole was nowadays completely out of date and that it was necessary to analyse the network on a metropolitan, indeed even regional, scale. Conceived at the origin as urban project, Villeneuve d’Ascq became a (master) piece of a metropolitan puzzle organized step by step, in cooperation and conflicts, to foster the metropolitan innovation system. As Lille metropole is the regional development pole, we can consider that the metropolitan innovation (and innovative) system is the keystone of the Regional Innovation System.

Beyond the history, I would like to read that research through the lenses of the evolutionary approach and to question the model of the RIS comparing the empirical study. R. Boschma and J. Lambooy (1999) proposed to cross evolutionary economics and economic geography. My attempt in that paper is also to take into account the urban planning dimension, because it is also a part of innovation policies. That dimension is introduced in the RIS analysis as one of the three types of RIS (Cooke and Asheim, 2006). Technopoles and science parks are considered as “regionalised

national innovation system” with finally limited linkages to local industry. We do not intend to prove the reverse because the effects of Villeneuve d’Ascq Technopole confirm that conclusion. But except Sophia Antipolis and partly Grenoble, other provincial technopoles in France were often local initiatives in order to imitate a development model; it was not decided at a national level, even if the DATAR (national institution for regional development and planning) have made an assessment of the phenomenon (Bruhat, 1990) and even if the local institutions tried to obtain national financial support to launch the programmes. So we would like to show in that paper the interactions between innovation policies at a national, regional and local scale. We try to distinguish the “small events” and the historical, institutional and economic context that allow to separate different periods of innovation policies and then the evolution of the RIS. In the following text, we expose three periods that also are three evolution steps of the constructing innovation system which give the region the role of “innovative hub”. In each part we give first a table which resumes the context at the three scales and “small events” which were decisive in the systemic evolution. In the conclusion we tend to confront the evolution of innovation policies on the one hand and the Nord-Pas-de-Calais path dependent development on the other hand. Then we suggest some conclusions about the difficulty to use the RIS model in order to analyse an empirical case in an evolutionary perspective.

2 - VILLENEUVE D’ASCQ, A NEW CITY PLANNED BY THE GOVERNMENT FOR INNOVATION

During the economic and demographic growth of the 1960s, various Lille Métropole development plans called for the metropolis to become a regional development pole for the Nord/Pas-de-Calais and one of France's regional metropolises (métropole d’équilibre). The latter was the result of a national policy aimed at diminishing the attractiveness of Paris by increasing the regional presence of the high-level service sector. In this context, the creation of a "new city" to the east of Lille was one of the options considered for managing urban sprawl and generating a high quality environment in a space dedicated to research and innovation.

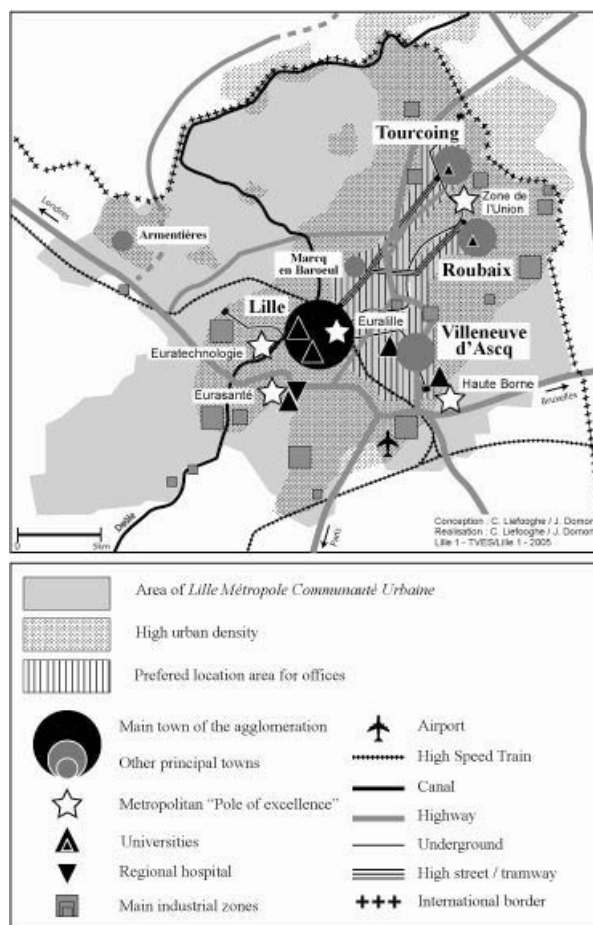
1st Lock-in : a decision at a national level		
Context in the 1950s-1960s		
National level	Regional level	Local level
Centralized country National growth	Plans for new industrial development Plans to foster the regional capital	Demographical growth Urban sprawl Growth of universities
The Vice-Chancellor of the Academy of Lille, representing the national Ministry of Education decided the exurbanization of the universities in the east of Lille		
The national government decided to create the « East-Lille New Town » (1966-1983)		

2.1 - The exurbanization of the University of Lille: A triggering event supported by the national government

The exurbanization of the University of Lille was the final outcome of a debate that began in the 1950s about the necessity of expanding the Lille Science College to accommodate the increasing number of students. Although local stakeholders argued for the renovation of derelicted estates inside the city limits, the Vice-Chancellor of the Academy of Lille, representing the national Ministry of Education, supported the creation in the suburbs of Lille of a "large scientific City (Cité scientifique) devoted to teaching and research in order to insure the development of the Nord through high quality professional and scientific training" (Baudelle, 1984). Also the president of the Regional Economic Development Committee, the Vice-Chancellor envisioned a more modern

university, one that would be more open to the business community. Backed by the national government, the Vice-Chancellor ended the local debate at the beginning of the 1960s, deciding in favour of his campus project. The Cité scientifique was constructed on the lines of Anglo-Saxon campuses in the rural area to the east of Lille that had long been protected from urbanization because of drainage problems, but where a highway interchange was planned (Figure 1). To complete the development project, the Vice-Chancellor decided in 1964 to transfer the Law College and the Liberal Arts College to this suburban area. He affirmed that it was a strategic plan for the future, declaring in 1967: "We have worked for the year 2000. The surrounding empty space will be filled by Engineering Schools and University Technology Institutes (IUT) for applied research, which industry can establish close to laboratories for fundamental research" (Baudelle, 1984). Until this vision came to pass, it was necessary to control the chaotic urbanization to the east of Lille and to end the spatial isolation of the university.

Figure 1: The spatial organization of Lille Métropole



2.2 - A new city for research and innovation

The extent of the investment required by the exurbanization of the Lille universities pushed the national government to create a "new city" in 1966, despite the disagreement of the local authorities. This original city planning operation was without precedent in the region and allowed access to exceptional funding sources and the technical means needed to make the project coherent. Inventing a new kind of city planning, daring new forms of architecture, attracting a new population of upper management, becoming a regional centre for research, innovation and high-tech industry were among the diverse objectives of this Ville Nouvelle east of Lille, which became Villeneuve d'Ascq in 1970 following the unification of three adjacent towns.

The new town was constructed at the same time as the deliberations about the future of the Lille-Roubaix-Tourcoing urban system, which started in 1966 as part of the national program of regional metropolises. The challenge was to transform a conurbation of three medium-sized towns into a metropolitan centre with a population ranging from 1 to 2 million inhabitants. This metropolitan centre was intended to be the driving force behind the economic renewal of the entire region, at a time when the textile, coal-mining and iron and steel industries were still the foundation of the regional economy in Nord/Pas-de-Calais. This challenge required the implementation of a policy designed to improve the quality of the environment (both landscape and habitations) and a policy designed to promote education and innovation. Villeneuve d'Ascq became the laboratory for these ambitious aspirations.

2.3 - Quality of the environment in the service of technological innovation

The landscape was at the heart of this "new city" project, a project designed to create "a city in the country" that would offer a new way to live. An unappealing site of marshes and flood zones provided the pretext for a series of lakes, parks and artificial hills. The preserved rural heritage, combined with a dense network of footpaths through sheltered greenery, contributed to the environmental quality that was the basis of the imagined "green city", in total opposition to the urban landscape of Lille, historically composed of a complex blend of industry and residential neighbourhoods. According to the functionalist and hygienist vision of 1960s urban planners, industrial and residential zones should be separate. Thus, the first development plan of the new town Lille-East called for industrial zones in the outskirts—hidden by hedges, trees and bushes—while offices and non-polluting industries (i.e., high-tech industries) were integrated directly into the city centre. Since the crisis in the mid 1970s caused the slump of real estate sales in the large industrial zones, the development plan for Villeneuve d'Ascq evolved to include the distribution of economic activities throughout the urban fabric, benefiting artisans, small-and-medium enterprises (SME) and service companies.

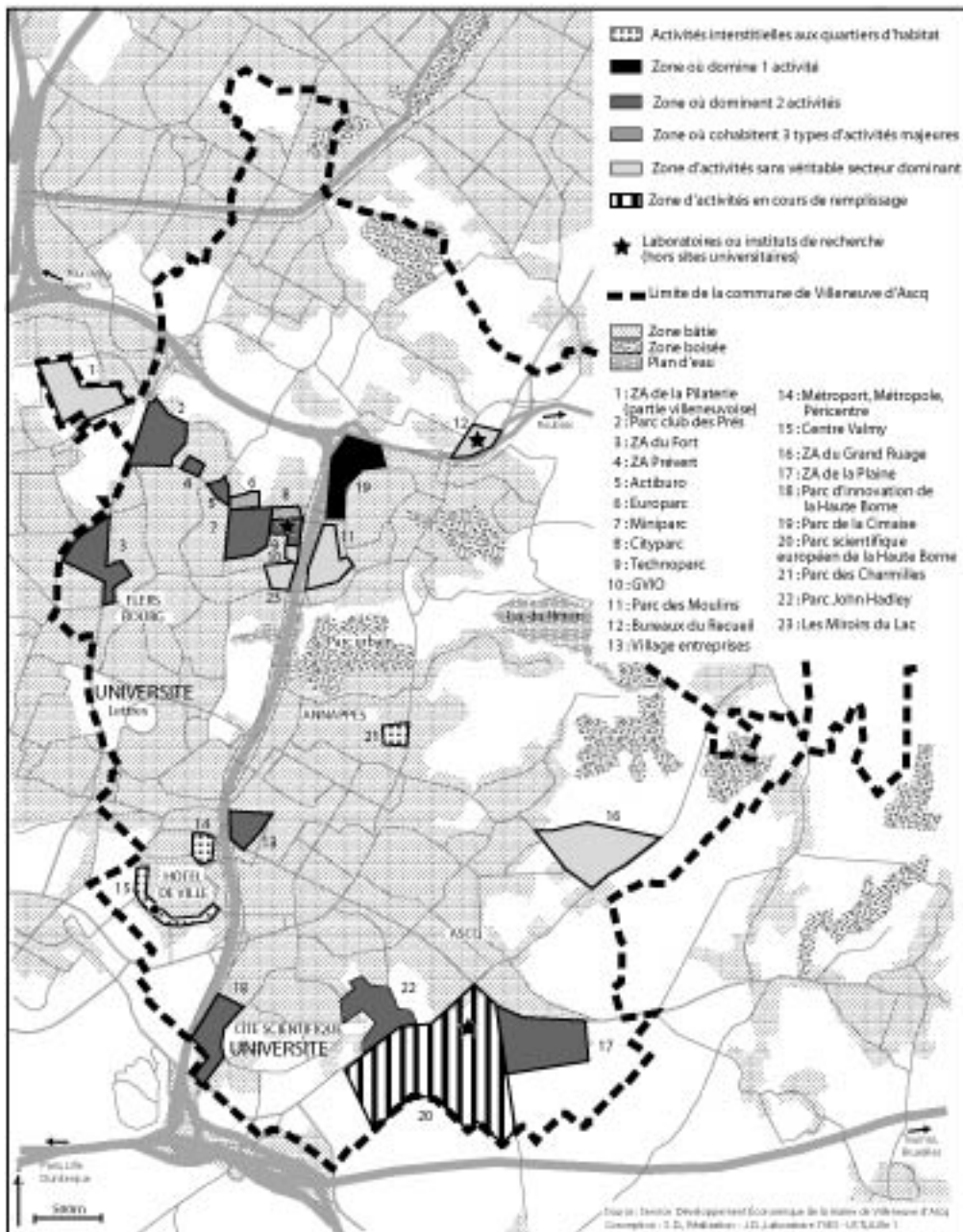
While the city centre continued to increase the number of office buildings with ground-floor shops, real estate promoters developed an innovative model of business parks in the rest of the city. The architectural quality of the constructions, the made-to-order character of the small buildings, the surrounding greenery, the proximity to the intra-urban highway network, even the offer of shared company services became essential factors in Villeneuve d'Ascq's attractiveness. Beginning in the mid 1980s, some industrial zones were restructured in a series of mini-parks inside residential neighbourhoods. In the end, the final model was similar to the traditional model of interwoven residential and economic zones, but a greater effort was made in terms of the quality of the environment, as witnessed by the priority given to innovative and non-polluting activities.

2.4 - Greater Boston's Route 128: a model for Villeneuve d'Ascq

In order to make Villeneuve d'Ascq the centre of innovation for the Nord/Pas-de-Calais, some thought it would be possible to reproduce Greater Boston's model for Route 128. This area was formerly a textile region, and when the textile industry crashed, it became a centre for high tech. In Villeneuve d'Ascq, the high technology laboratories and companies were supposed to be scattered

along the intra-urban highway linking the activity zones north of the city to the Cité scientifique and its Haute Borne land reserve to the south (Figure 2).

Figure 2: Spatial organization of Villeneuve d'Ascq



At the beginning of the 1970s, the national government provided the necessary impetus for the creation or delocalization of research centres to this area east of Lille (e.g., textile and agro-alimentary research centres). Certain government ministers, with local or regional roots, became interested in this city's development and defended the creation of institutes of higher education and research or regional offices of certain administrations (e.g., telecommunications). But these centres for research and higher education didn't produce the number of jobs expected. Several reasons for this lack of a multiplier effect have been proposed: the proximity of Paris, the refusal of upper management to move to the north of France, the competition from the south of France. Added to these reasons were the lack of interest of local industry in research and the difficulty of attracting companies from northern Europe. In the end, the environmental argument couldn't offset the fact

that the "new city" was not yet finished and that the critical mass needed for a budding centre of innovation was missing.

On the other hand, Villeneuve d'Ascq offered businesses that felt constrained by the decaying urban fabric of metropolitan Lille an appealing alternative. Its situation at the intersection of the metropolitan and international highway systems appealed to mass distributors, regional public tertiary institutions, and regional headquarters of private companies¹. However, although the objectives in the number of jobs created were attained, the ordinary tertiary sector and the public sector had a greater weight than the private high-level service sector than was originally planned. The secondary sector, which was supposed to constitute half of the job offer in the city, represented only a modest share of the total jobs created, particularly in terms of high-tech industries.

By the middle of the 1980s, the results for Villeneuve d'Ascq had not reached the level of its initial ambitions. Still, at the metropolitan scale, the city possessed an original profile: a tertiary city with a young active population of skilled workers. This created jealousy between the different parts of an urban centre that was painfully extricating itself from an economic crisis, provoking both Lille and Roubaix to attempt to absorb this new city. It is against the complex political and economic backdrop that the mayor of Villeneuve d'Ascq decided to defend his city's autonomy by launching the technopole project in 1985/86.

3 - CREATING A TECHNOPOLE: A TOOL FOR REGIONAL DEVELOPMENT

In 1983, the development process of the new city was officially closed. The image of Villeneuve d'Ascq was that of an unfinished city, a campus city, a suburb of Lille. The mayor wanted to propose a more ambitious project to the city's inhabitants than just living in a calm "green" suburb. He also wanted to impose his city as the 4th large urban centre of metropolitan Lille. The evolution of France's political and institutional context and the rising interest of stakeholders in policies encouraging technological innovation made it easier to rally the local research, business and political communities around the project, called Villeneuve d'Ascq Technopole.

2nd Lock-in : a decision at a local level		
Context in the 1980s-1990s		
National level	Regional level	Local level
Decentralization End of growth European market The Channel tunnel The High Speed Train	Decentralization End of coal mines Crisis in textile and steel industries European regions Tunnel and High Speed Train (HST)	Political competition between the four large urban poles of the conurbation Euralille and the HST to Paris, Brussels, London The Mayor of Lille is/was the french Primer Minister
1986 : the creation of Villeneuve d'Ascq Technopole, a local agreement between : <ul style="list-style-type: none"> - the Mayor of Villeneuve d'Ascq - the President of the University of Sciences and Technologies - the President of the Chamber of Commerce 		
1989 : an agreement between the mayors of the four greatest cities of the Urban Community of Lille, for a new map of future « Excellence Poles »		

¹ Like other new cities, Villeneuve d'Ascq benefited from the creation of regional headquarters by the biggest French companies. The replication of the business park model and the relational proximity of the managers, the upper-level bureaucrats and the network of developers and urban planners made drawing these jobs to the new towns in France easier.

3.1 - The emergence of the technopole project

As is often the case in matters of creation and innovation, there is a myth behind the story of how the project came into being. Thus, the technopole project is supposed to have been conceived in 1985 by the mayor of Villeneuve d'Ascq on his return from a conference on scientific cities held during Expo'85 in Tsukuba (Japan). However, the stakeholders at the time all agree that it was rather more of a collective process of maturation, connected to exchanges between French universities on the social and economic role of research and to trips by developers and politicians to observe the innovative operations at Sophia Antipolis and Grenoble. Even before the concept of technopole had been elaborated, an alliance between public research institutions and private enterprises had been advocated to counter the competition from new industrial nations. The 1986 launch of "the high technology city" of Nord/Pas-de-Calais coincided with the creation of the association Villeneuve d'Ascq Technopole (VAT) by the mayor, the University of Sciences and Technologies (USTL), the Chamber of Commerce and Industry (CCI) of Lille-Roubaix-Tourcoing and the representative of the Regional Delegation for Research and Technology (DRRT).

At the time, this agreement between a socialist mayor, a communist university president and the business community was perceived as being unnatural in a region marked by a history of confrontations between trade unions and employers. The convergence of the interests of stakeholders from such different worlds was facilitated by political proximity (between the mayor and the president of the USTL), professional proximity (the DRRT representative was also a professor at the USTL) and geographic proximity (the president of the CCI was also the managing director of a robotics company in Villeneuve d'Ascq). In addition, the decision to transform Villeneuve d'Ascq into a technopole came about during a period of economic, institutional and political change that encouraged the emergence of new practices. With the construction of the Channel Tunnel, the arrival of the high-speed train (TGV) network in Lille, and the creation of the Euralille business centre, the Nord/Pas-de-Calais region was finally able to imagine a new future. At the national scale, Pierre Mauroy, both Prime Minister of France and Mayor of Lille, began converting the Left to the market economy. This ideological reversal and the circulation of ideas between political stakeholders at the local and national level helped change the mentality of the decision-makers at the regional level. Finally, within the framework provided by the laws on decentralization, the national government began a process of regional deconcentration of the innovation-support structures. As early as 1984, the regional stakeholders were also encouraged to support local companies and laboratories in the context of the State-Region plan contracts (CPER). Would this favourable context allow Villeneuve d'Ascq to become a technopole?

3.2 - Villeneuve d'Ascq Technopole: innovative milieu or territorial marketing?

The technopolitan dynamic relies on an ideal chain of events: the synergy between the research and business communities, the creation of innovative companies, the advent of high-technology activities and territorial development. The primary mission of the VAT association mentioned above was to transform the spatially juxtaposed technological resources in and around Villeneuve d'Ascq into a technopole. The area's potential was enormous: it contained 70% of the regional university capacity, reputable engineering schools, national research centres, the largest cabled network in France, a subway that was unique in the world (VAL²), computer science and electronics companies, in addition to the telecommunications companies that were established in Villeneuve d'Ascq during the 1970s. But though the local decision-makers had imagined a technopole, it was in fact first necessary to foster relationships between the researchers and the entrepreneurs. At the local level, VAT organized "technopole breakfasts". At a larger scale, VAT joined the international networks dedicated to research and the innovative economy. To facilitate its integration, in 1989 VAT established in the Cité scientifique an international conference centre outfitted with what was, at the time, exceptional equipment: a video-conference system and a satellite antenna. VAT also joined the international association of science parks, and later the

² The VAL (*Véhicule Automatique Léger*) is composed of Automatic Light Vehicles (i.e., without drivers).

France Technopoles network. The association also participated in international trade shows in order to promote the technopole, particularly to European high-tech companies that could, if they chose to settle in Villeneuve d'Ascq, reinforce the city's technopolitan potential.

These objectives made it necessary to elaborate a communication strategy. In its initial version, the association's territorial marketing tactic stressed the city's geographic situation at the intersection of the highway system connecting Paris, London and Brussels and the quality of the city's environment. With 300 hectares of parks and gardens, a lake in the heart of the city, two golf courses and business parks situated in natural settings, VAT targeted the decision-makers in north-west Europe, who defined ecology as a lifestyle. Three years later, the brand image constructed around the concept of "green technopole" was enriched by a policy that valorised innovative local companies, high-tech companies already established in Villeneuve d'Ascq, universities, research laboratories and structures supporting entrepreneurship and technology transfers. However, these arguments were not enough to compensate for the international and national competition between technopoles. Thus, in 1990, when Villeneuve d'Ascq, Amsterdam and Louvain (Belgium) competed for the "electronic city" project that was supposed to trigger an influx of 200 researchers, Villeneuve d'Ascq didn't win the prize. Despite the efforts of VAT, which offset for its lack of resources by relying on the human resources of the economic development service of Villeneuve d'Ascq, the chosen territorial marketing tactic couldn't disguise the limitations of the local technopolitan environment.

3.3 - Institutional experimentation supporting the creation of innovative companies

The city of Villeneuve d'Ascq and the USTL also engaged in institutional experiments, sometimes bordering on illegal but tolerated by the Prefecture and/or the various Ministries. Thus, starting in 1984/85, even before launching the Villeneuve d'Ascq Technopole project, the city made empty municipal buildings throughout the city available to entrepreneurs at moderate prices. Then, a former agricultural building was turned into the city's first public incubator for innovative companies. From time to time, the USTL unofficially rented offices in its research buildings to entrepreneurs working closely with the research laboratories. An incubator was even built on the outskirts of the campus by a private developer, but this support structure disappeared when Technoval opened. Technoval, Villeneuve d'Ascq's new incubator, replaced the municipal buildings made available previously. Technoval was located strategically: near the highway hub on the outskirts of the USTL campus and at the entrance to the university lands ceded to the city for the creation of the Haute Borne Innovation Park³. This land transfer operation is indicative of the institutional cooperation that has supported the Technopole project since its inception in the 1980s. SME were established in the Innovation Park, as well as national research institutes (e.g., meteorology, transportation and transportation safety). Other initiatives were founded on the hypothesis of a close relationship between the academic and business communities in order to foster innovation and encourage the creation of innovative companies.

In fact, the USTL's experimentation began at the beginning of the 1980s with "service workshops" in electronics, computer science, automation, chemistry and the environment. The objective was to make the knowledge and know-how of the research laboratories available to the business community of the Nord/Pas-de-Calais region. These workshops, hosted by the USTL, insured their financial autonomy by working on development projects proposed by regional companies. In the long term, they were supposed to become independent innovative service companies. However, this experiment ended after 10 years because 1) the workshops never transformed into innovative companies and 2) the transfer of competencies permitted some large companies to create their own research & development service. The computer-aided automobile production workshop—a collaborative effort of the University of Valenciennes (situated 50 kms south-east of Lille) and the automobile manufacturer, Renault—never saw the light of day because it didn't obtain the

³ Not to be confused with the current Haute Borne Science Park (see *below*)

authorization of Pierre Mauroy, then Prime Minister of France. On the other hand, the success of the service workshop in electronics and computer science had a very interesting effect on the traditional collaboration between the university and business world.

3.4 - The university/business relationship: from contracts to research networks

The USTL did not wait for the technopole launch to get involved in regional development. Contracts were signed between laboratories and industrialists establishing bilateral and quasi-confidential relationships. Such contracts led to the 1983 inauguration of the first subway line in Lille, whose totally automated system was designed by a USTL laboratory in collaboration with the company, Matra. The university obtained no royalties, but the international prestige of the VAL system brought new contracts to the inventor's laboratory. This public/private partnership resulted in the birth of a regional transportation research group that brought together other public research labs, engineering schools, large companies and territorial authorities. Twenty years later, this collective assembly of knowledge and competencies about land transportation (rail and automobile) was valorised by the national policy supporting competitiveness poles, which will be discussed further on in this text.

The same contractual path was taken in the electronics sector, demonstrating the complex interweaving of public and private stakeholders at the different levels. The collaboration between a USTL lab and Léanord—an innovative company that sprang from the ISEN⁴, an engineering school at the Catholic University of Lille and a competitor of the USTL—led to the Nanoréseau, a local computer network. Created in 1960, Léanord had become the second largest French manufacturer of personal computers by the beginning of the 1980s. With the support of ANVAR, the national agency for innovation, Léanord standardized and patented the Nanoréseau, which was then distributed to public education institutions as part of the government programme, Computers for Everyone (Informatique pour tous). However, the government forced Léanord to share the computer production with the company, Bull, whose Villeneuve d'Ascq factory in 1985 was already assembling personal computers. Although the USTL gained financially from the collaboration, several years later, international competition killed not only the small regional start-up, Léanord, but also the large national company, Bull. Despite this disappointment, the collaboration between the USTL and the ISEN expanded to include other projects, in association with the University of Valenciennes. This collaboration led to the 1992 creation of the IEMN (Institute of Electronics and Micro-electronics of the North of France), whose primary building was placed symbolically at the entrance to the Cité scientifique in Villeneuve d'Ascq.

The explanations presented above of the emergence and the development of the technopolitan project in Villeneuve d'Ascq shows the complexity of the links between the stakeholders at the different scales, as well as the almost random character of the chain of events that concretized the collective project. In this way, the institutional innovations often predated the political decision to place Villeneuve d'Ascq on the map of the French and European technopoles. However, the 1990s changed the principles on which the project was founded: globalization and metropolisation modified the scale at which it was necessary to envision a technopole, if indeed it was still possible to think in terms of a technopole.

4 - FROM A TECHNOPOLE IN VILLENEUVE D'ASCQ TO A REGIONAL TECHNOLITAN NETWORK

The ambition of Villeneuve d'Ascq was to become a technopole, a city whose technopolitan dynamism would foster the development of metropolitan Lille and the Nord/Pas-de-Calais region. Paradoxically, the urban development plans called for business parks and not science parks (i.e., parks dedicated to high technology companies associated with research labs). More exactly, it appears that the projects initiated during the "new city" period, and later the projected hectares at

⁴ Norbert Segard, the founder of the Superior Institute of Electronics of the North of France (ISEN: *Institut Supérieur d'Electronique du Nord*) supported the development of Villeneuve d'Ascq when he was the Minister of the Post and Telecommunications.

the Haute Borne Innovation Park, were deviated from the initial objectives. At this time (the 1990s), "excellence poles" were also being created within the boundaries of Lille Métropole, while competence networks related to research, innovation, and company creation were being established at the regional scale. Though urban planning and innovation network building are not interchangeable, they do complement each other, even as they evolve in terms of their definition and their spatial scale.

3rd Lock-in : the switch in the national policy about regional development		
Context in the end of 1990s – 2000s		
National level	Regional level	Local level
Globalization Competitive regions 1999 : innovation Laws 2004 : clusters Campus of research Plan campus regeneration	Cooperation with Belgium and kent Lack of public research Competive European cities	Failure of Teleport local project (national monopoly) Failure to obtain the SOLEIL project (national research)
Increase in the networking to realize the « excellence poles » and « poles of competitiveness »		
Regional Innovation Policy reinforced		

4.1 - From Villeneuve d'Ascq Technopole to metropolitan excellence poles

The plan for a polycentric technopole at the metropolitan scale came into being at the beginning of the 1990s when Lille began its cooperation with the Belgian section of the conurbation and its "metropolitan bifurcation" (Paris & Stevens, 2000). The objective was to move from a mid-sized French city to an international metropolis. Euralille, the business quarter situated at the junction of the Paris-London/Paris-Brussels TGV lines, was the architectural sign of a politically desirable urban evolution: Pierre Mauroy, then Mayor of Lille and Prime Minister of France, succeeded in convincing the SNCF (the national rail company) to pass the TGV line through the centre of his city instead of linking the great capitals of northern Europe directly. Since the construction of Euralille exceeded the financial capacity of a single city, even one as large as Lille, Pierre Mauroy negotiated the support of the other mayors in Lille's urban system; in exchange for this support, "metropolitan excellence poles" were planned to provide a counter-weight to the reinforced centrality of Lille, the primary city in the urban system (Figure 1). The Eurotéléport in Roubaix would be a satellite base for international business communication; Eurasanté would become a centre for innovative companies around the regional hospital centre; and Villeneuve d'Ascq would welcome the Haute Borne European Science Park.

The history of the Haute Borne Science Park is representative of the competition between the large cities in Lille's urban system. Already planned at the time of the "new city" but never constructed, and then placed on the map of metropolitan excellence poles 20 years later in 1988, the development of the park was never a priority until 1996, when the Nord/Pas-de-Calais region became a candidate to host the SOLEIL⁵ particle accelerator project. Despite the mobilization of the political, academic and business worlds, Villeneuve d'Ascq was not chosen by the government. In spite of this failure, the local authorities decided to build the Haute Borne European Science Park in order to attract research laboratories and business research and to foster the international dimension of the local research resources.

The ups and downs of the economic situation, as well as evolving technology, also played a role in modifying the map of excellence poles planned at the end of the 1980s. The Eurotéléport project was a victim of the French monopoly of telecommunications and, subsequently, of the success of the Internet. However, at the end of the 1990s, the growth of the "new economy" brought the

⁵ *Synchrotron Optimisé pour L'Emission intense de la Lumière*, or SOLEIL, is a very high-energy particle accelerator optimized for the intense light emissions.

Euratechnologies project, which transformed a former textile factory into a base for computer and Internet start-ups. The Zone de l'Union project, between Roubaix and Tourcoing, was developed to provide a home for a research centre for innovative textiles and an Image centre devoted to cinema and multimedia.

The excellence Poles of Lille Metropolis in 2008		
Name of the Pole	Urban programme	Economic dimension
EURASANTE	Innovation Park for Health and Food	Bio-Incubator
EURATECHNOLOGIES	Urban regeneration for ICT	ICT Incubator
POLE IMAGE	Urban regeneration for Multi-media	Multi-media and video games industries
POLE TEXTILES INNOVANTS	Urban regeneration	Applied Research centre for innovating textiles
VILLENEUVE D'ASCQ TECHNOPOLE	Haute Borne European Science Park	Incubator with the University of Sciences and Technologies of Lille
FASHION DISTRICTS	Urban regeneration	Incubator for fashion creation

The excellence poles of Lille Métropole were large-scale urban development projects, sometimes involving the creation of high-quality environmental parks on the outskirts of the city (e.g., Eurasanté, Haute Borne), sometimes involving urban renovation of military or industrial land in the heart of the city (e.g., Euralille, Eurotéléport, Zone de l'Union, Euratechnologies). The range of parks with specialized technological profiles provided a source of high-potential technopolitan sites, which still need to be filled. Lille Métropole thus entered the race to attract national and international companies and/or public scientific and technical institutions.

The last strategy has aimed to provide the region with the critical mass of researchers that is still missing. Despite the improvement of the environment and the ever-increasing cultural offerings, the attractiveness of Lille and its surrounding cities for upper management and the necessary highly skilled workforce remains low. Lille finds itself competing with other French or even European metropolitan centres. Thus, it appears that the metropolitan dynamic also supposes a strong endogenous development based on the efficient articulation of the numerous geographically-dispersed technopolitan stakeholders.

4.2 - Towards a metropolitan governance of the technopolitan dynamic

In the Lille Métropole, the multiplication of sites hosting innovative companies and/or research-related companies raised the question of technopolitan governance, especially in terms of facilitation, communication and networks. The Villeneuve d'Ascq Technopole (VAT) association had neither the legitimacy nor the financial means to assume the responsibility for a polycentric technopole. For this reason, in 1994, VAT ceded its place to Technopole Lille Métropole (TLM), an organization supported by the Urban Community of Lille, the universities, the engineering schools and the business community. The mission of TLM is to create and foster a network of technopolitan stakeholders, both existing and future. This organization backs more specialized structures, for example, Digiport, the development agency for information and communication technologies, and CIEL, the Centre for Innovation and Exchange of Lille. Operating since 2005 at Haute Borne European Science Park, CIEL has brought the teams that were previously dispersed throughout the metropolis together in the same building. Busy promoting exchanges between universities and companies and fostering entrepreneurship, CIEL is also a host site for people with innovative projects, receiving them either at the departmental technological incubator of the Nord or at the regional incubator of the Nord/Pas-de-Calais.

TLM shares the task of technopolitan governance with Eurasanté, which plays the roles of consultant, bio-incubator and bio-health park. In addition, the universities of Lille and the region

also play a significant role in the technopolitan governance process. As well as participating in the previously mentioned organizations, the universities provide financial support for company creation, innovation and technology transfers through associations and networks of diverse organizations. They are, to differing degrees, involved in research groups (networks of laboratories) and regional competitiveness poles (networks of laboratories and companies). Finally, certain university presidents and professors are involved, either institutionally or individually, in setting up regional research-related development programs (e.g., SOLEIL), restructuring regional research and participating in think tanks. The scale change caused by the technopolitan factor in the Lille Métropole has thus modified the governance of this polycentric technopole that is now functioning more than ever as a network. Still, to respond to the increase in national policies designed to reinforce the scientific and technological potential of France internationally, reconfigurations are now taking place.

4.3 - The regional scientific potential: a development called into question

The number of full-time researchers working in the regional research community, both public and private, remains under the national average. To remedy this lack, successive CPER contracts were signed, giving a priority to relocating public research laboratories in the Nord/Pas-de-Calais. These contracts led to a significant increase in the research personnel, but didn't close the gap between the Nord/Pas-de-Calais and its principle regional rivals. The move from a national policy of balanced territorial development to a policy of territorial rivalry can even be a real handicap in the inter-regional competition for national funding for research. For example, the Nord/Pas-de-Calais didn't obtain the SOLEIL project for Villeneuve d'Ascq because the government decided to build this international-level device in Orsay in the Paris region. After negotiation, the regional and metropolitan authorities obtained in compensation the relocation to Villeneuve d'Ascq's Haute Borne European Science Park of two well-know research institutions—one working on advanced information and communication technology and one doing interdisciplinary research combining physics, chemistry and biology. The objective was, and still remains, to reinforce the synergies with the regional laboratories.

However, the question is whether or not the regional dynamic can come to grips with the competition afforded by the most prestigious scientific institutions, which have more and more researchers, more equipment and more funding due to their own attractiveness and also due to recent national policies designed to foster international excellence. Faced with this competition, the Nord/Pas-de-Calais region has had no choice but to push the regional research labs to form networks, structuring them as national or even international competence centres. The objective is again to reach the critical mass of researchers and funding needed to foster synergies in the domains of land transportation, biology related to health and nutrition, computer science, micro-electronics and nanotechnology, materials chemistry and the environment. For almost 15 years, these research centres have been working with large, frequently extra-regional companies, valorising their discoveries through patents and granting licences. This attempt to structure regional research has been occurring simultaneously with efforts to encourage innovation, with a sometimes complex overlap with national policies.

4.4 - The complex overlap of the policies fostering innovation

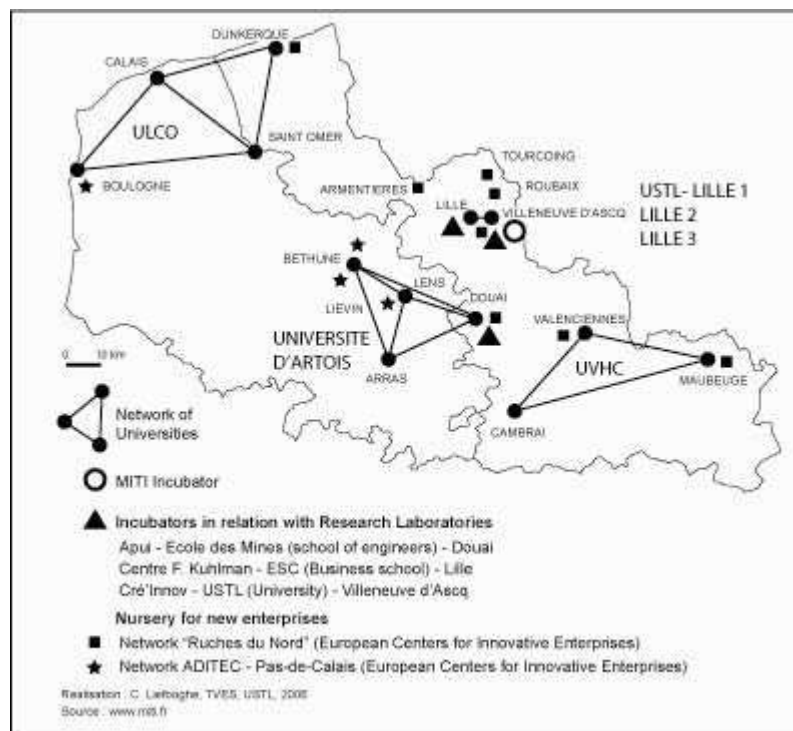
For the last 30 years, the regional policies of innovation have had a triple objective: the modernization of existing companies, the creation of innovative companies and the cooperation between public research institutions and the business world. Depending on the action and the time frame, these policies have been interwoven with European, national and even local policies. The resulting policy tapestry is thus quite complex. A few aspects of this complexity are presented below.

The evolution of the regional production systems began in the 1980s with the creation of a Regional Centre for Computer-Aided Production and a Computer-Aided Design (CAD) network. These

structures made the computer and electronics skills of the engineering schools and universities available to SME. The widespread diffusion of new information and communication technologies (ICT) also relied on the increasing creation of regional structures, such as Applica in 1988, a trade show devoted to computer applications; Infonord in 1995, a centre for professionals in information sciences and technologies; Déclit Net in 1998, an e-business resource centre; and Digiport in 2001, a ICT service centre. From computer-aided production to e-business, twenty years of partnership-supporting public policies have encouraged the emergence of a regional and metropolitan market in computer-related technology.

In addition to sharing knowledge, the regional economic fabric can also be transformed by creating innovative companies. To this end, many local support structures with mixed financing were launched, including the departmental technological incubator of the Nord, the Technoval incubator of Villeneuve d'Ascq, the incubators of the various engineering schools, and the pre-incubator of the USTL. Created in 1999 through the national law on innovation, the regional incubator MITI detects and assists technological projects. Unlike a number of incubators in France, MITI houses no companies, instead preferring to rely on the existing network of incubators in the region (Figure 3). MITI is at the top of the competence network developed in the Nord/Pas-de-Calais to support innovation and the creation of innovative companies. Diverse policies provide financial support for innovation. Among these policies, the Regional Starter Fund is intended to reinforce the capital of new research-related companies. Local initiatives often associate the academic and business communities to organize and manage clubs for professionals in such domains as electronics, logistics or textiles, for example.

Figure 3: Network of incubators in the Nord-Pas-de-Calais



The efforts to structure research and the support for technology transfers towards regional companies resulted in the competitiveness poles that were initiated by the national government in 2005 in the domains of land transportation, healthcare, innovative textiles, domestic-use materials, sea products, mass distribution and distance sales companies.

The development path of projects			
Transport		Mass Distribution	
1970s	VAL tube by Matra Industry and University of Sciences and Technologies of Lille	1920s	From textile industry to mail order industry
1980s	Research group on transports and security	1960s	Hypermarkets, industrialisation of trade and ICT innovations
1990s	Regional network of research and innovation with large enterprises on Land transports (car, train)	1980s	Local development of producer services ; a cluster in advertising and communication services
2000s	Label of « competitiveness Pole »	2000s	Label of « competitiveness Pole »

Tax exemptions and lower social security contributions are now conditioned on the reinforcement of the synergies between the research centres and the companies, with the objective of making technological advances that will create new niche markets. However, the national policies supporting innovation and technological excellence run the risk of reinforcing the metropolisation of the regional technopolitan dynamic. In fact, the geographic distribution of the competitiveness poles shows that Lille Métropole participates in 5 of the 6 officially-recognized regional poles.

4.5 - The technopolitan dynamic and the inertia of the regional economic fabric

Given the handicaps of the Nord/Pas-de-Calais region, the Villeneuve d'Ascq Technopole took on a sizeable challenge in its quest to become the driving force behind the regional reconversion through innovation. The region's position along the Belgian border long explained the lack of strategic technological implantation in the region. Moreover, until the end of the 1960s, the full employment of the population masked the imperative of industrial diversification. The crisis in the mid 1970s hit the textile and steel and iron industries hard, just as they were beginning to modernize their production systems. Even today, many industrialists in the Nord/Pas-de-Calais have a pragmatic attitude towards modernization in their companies and still do not routinely collaborate with public research institutions. The two worlds follow their own developmental logic in reciprocal ignorance. In this context, it was difficult for the Villeneuve d'Ascq Technopole and the regional universities to transform the local economic fabric through technology transfers. In addition, the high technology activities established in Villeneuve d'Ascq in the 1970s didn't provoke any cumulative development. On the contrary, several large electronics and computer companies closed their doors in the 1990s: for these companies, the "new city" provided only the opportunity to open sales branches or computer assembly lines.

Today, a few industrial companies base their growth on R&D (e.g., the Boiron pharmaceutical laboratories), but the industrial context still doesn't have the critical mass to generate cumulative development based on local technological resources. However, if the definition of high-tech industry is widened to include advanced producer services, Villeneuve d'Ascq has for 20 years been a real centre for creating high-tech jobs and companies. Such advanced services play an essential role in the transformation of production systems through innovation (Liefoghe, 2002). Scientific service companies, management and/or organizational consulting services, especially Information Technology (IT) consulting services, have been created/established in business parks or office buildings in the city centre. Apart from the very few SME employing 50 to 250 people, these companies and services are micro-companies, whose developmental dynamic, even survival, is highly dependent on the random evolution of the markets for innovation consulting and new technology engineering.

Villeneuve d'Ascq is only one of the preferred spaces in metropolitan Lille for establishing advanced service companies (Damette, 1997). When choosing a location, the quality of the property proposed and the reputation of certain addresses play a more important role than the technopolitan dynamic. In addition, few IT companies, especially those who are content producers (e.g., cinema,

video games, websites), are directly connected to public research institutions. The effect of the technopole is indirect, through the training of future employees and entrepreneurs. In addition, the impact of the incubators in the area is difficult to evaluate. Although nearly 230 companies have availed themselves of the services of Technoval and the Nord's departmental technological incubator over the last 15 years, these innovative SME are not necessarily connected to the world of research.

The metropolitan excellence poles and competitiveness poles demonstrate the local and regional political desire to respond to the imperative of competition generally, and territorial competition specifically. The priorities include reaching excellence in research, developing the links between the scientific and economic communities and improving the environmental quality of the technology parks of Lille Métropole. But these challenges are getting more and more difficult to meet since recent national policies favour the scientific, technological and industrial sites that have already attained international excellence, such as Paris, Toulouse or Grenoble. Nearly thirty years of regional and local innovation policies have just allowed the Nord/Pas-de-Calais region to align itself with the national average. The economic fabric is still too focused on traditional activities and on the search for greater productivity, whereas other French metropolitan centres have bet on flexible production systems and on new activities linked to research. The Nord/Pas-de-Calais region runs the risk of being again relegated to the category of disadvantaged regions.

5 - CONCLUSION

When economic globalization was just beginning in France 20 years ago, traditional industrial regions faced the challenge of innovation, of inventing new products and/or new production processes. At both the national and regional scales, innovation policies were based on a sectorial approach: modernizing the textile industry or encouraging the development of the electronics industry, for example. The objective was also to transform the economic fabric of the country by supporting the creation of innovative companies and encouraging relationships between companies and universities. A second type of policy encouraged the development of technopoles (i.e., "technology city"), which were supposed to promote synergy between the academic and business worlds. Except for a few national operations like Sophia Antipolis in the south of France, most of these technopole initiatives were local. So for the last thirty years, France's policies of innovation have swung back and forth between innovation seen as the result of cooperation between public research institutions and private enterprise and a wider definition of innovation, without any specific connection to research institutions outside the confines of private enterprise. At the start of the new millennium, many local, regional and national policies have come together to encourage technology transfers, innovation, and the creation of innovative companies. The ultimate goal is to create a network of stakeholders and competences that will promote the learning process in an increasingly global and competitive information economy. A recent national policy emphasizes the creation of "competitiveness poles" (pôles de compétitivité) in the form of local and/or regional clusters (i.e., networks of companies and public research laboratories).

The result of those different policies on the emergence of a Regional Innovation System in the north of France is not easy to analyse because the story of Villeneuve d'Ascq and the other science and technology parks is just a part of the changing regional productive system. Even if the interactions between the national, regional and local levels seem to create step by step a RIS through the metropolitan area, they have other results in the rest of the region, in particular in "peripheral" territories as rural areas or the former coalmine area (Liefoghe, 2004). Even in Lille Métropole some part of the industrial system have changed nearly without the help of public actors, such as the restructuring of some textile firms in mail order companies (Schulz, 2006 ; Liefoghe, 2006). If innovation policies tried and failed to help the textile industry in the 1970s, at the beginning of the globalization, the initiative of some entrepreneurs and the imitation by others helped the metropolitan economy to find new paths of development in mail order industry, mass distribution or

hotel industry for example, leading to the clustering of distance selling and producers services such as communication, logistic and printing. In a second step of the development pathway, the national policy of “competitiveness poles” was used by local and regional public actors in order to create an innovation system between these tertiary activities and the universities (research on ICT, direct marketing for example). So we can say that the RIS is not still achieved even if the recent efforts to create interactions between actors are effective.

To speak about the relations between economic geography and urban planning, we have seen that the creation ex-nihilo (i.e., out of nothing) of the Villeneuve d'Ascq technopole is the result of a local political will that exploited a favourable national and regional context. This technopole is original, in that it is not just a simple science park, but rather is a "new city" with a recognized quality in terms of lifestyle and environment. Its appeal to the most qualified populations and companies has made this wide-ranging urban development project a success on the metropolitan scale. On the other hand, weak economic growth and the inertia of the local economic system has been an obstacle in the path to becoming a veritable technopolitan milieu. Though the university has embraced the business world, the regional industry remains far from the world of public research. Moreover, the technopolitan dynamic changed scale in the 1990s due to the expansion of Europe, the Channel Tunnel, and the process of metropolisation. The Lille Métropole has multiplied its excellence poles, and the technopolitan governance has developed at this scale. Paradoxically, though Villeneuve d'Ascq is no longer the centre of gravity of the metropolitan technopole, the Haute Borne European Science Park has insured that the city has a science park, which is a planning and development tool that was used in other French cities more than 20 years ago. The increasing complexity of the local innovation system is the result of some political decisions which can be considered as lock-in processes in a changing economic, political and geographical system at the national, regional and local level.

Nowadays the metropolitan policy of excellence poles is partly integrated in the national/regional policy of competitiveness poles. Could those poles become a new path of development for the region? The first observations show that relations between enterprises and public research or universities are essentially due to large firms (with local roots) in traditional activities. It seems hard to leave rigid trajectories of old industrial regions and the ICT innovations do not avoid the negative lock-in effect because they are used to industrialize commercial processes for example and not to create new products or services. The Nord-Pas-de-Calais region is following the same regional dependent pathway because of a lack of attractivity, a lack of innovative SMEs, a lack of interactions between enterprises and public research or universities, because of empirical innovations in local enterprises and innovations imagined as a new industrial way, from mass manufacturing production to mass services. The very recent policies encouraging creativity and creative industries tend to construct new regional advantages in a highly competitive world, but the results are questionable in territories marked by a history of Fordian industrial development. The third part of the Triple Helix, that is to say government, is also too weak to change the long-term evolution of the (non-achieved) regional innovation system. The political weaknesses are the local political competition, even in the same party, the competition between the institutions at different levels or even between individuals, and the competition between the local development urban projects. The complexity of competitive interactions between agents is higher and higher and leads the so-called RIS to a governance fragmentation.

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